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Sustainable Business and Innovation

# Diversity in Sustainability Collaboration

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# Diversity in Sustainability Collaboration:

## Influence of Home-Organisation Diversity on Team Mental Model Development in Interorganisational Workgroups for Sustainability Challenges


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# Abstract

Organisations increasingly work together to face complex sustainability challenges. As groups have often proven to be more innovative than individuals, they might establish interorganisational workgroups to address these challenges through innovation and creative problem-solving. No research to date appears to have combined the fields of interorganisational collaboration and team diversity to investigate the influence of home-organisation diversity on solution-creation processes in interorganisational workgroups. Moreover, workgroup members need to have a similar understanding of workgroup goals and how to achieve these goals, i.e. they need similar team mental models, but the connection between team diversity and the development of team mental models appears to be an under-researched area. The influence of home-organisation diversity on the development of similar team mental models for the solution-creation process in inter-organisational workgroups for sustainability challenges is therefore not yet understood. To address this research gap, this thesis aimed to investigate this relationship in its full dynamic complexity.

Using a Grounded Theory approach, this thesis analysed the functioning of three workgroups of the Green Business Club Utrecht Centraal, a network collaboration organisation aiming to make the central station area of the city of Utrecht, the Netherlands, more sustainable. Through semi-structured interviews, document analysis, and meeting observations, the effects of home-organisation diversity on these workgroups were examined. This thesis created a framework on how this type of diversity influences the development of similar team mental models. Home-organisation diversity's effects proved to be dual in nature. It influences workgroup functioning both positively, allowing for more holistic team mental models and solution-creation processes, and negatively, creating boundaries due to differences in organisational cultures and incentives. This thesis thus connected the fields of collaboration theory, team diversity literature, and team mental model research. It provided a better understanding of how home-organisation diversity influences the functioning of interorganisational workgroups in a sustainability context. This enables organisations to collaborate more effectively in addressing sustainability challenges in the future.

# Executive Summary

## Context Introduction

The past five years the Green Business Club Utrecht Centraal (GBCU) has committed itself to making the central station area of Utrecht, the Netherlands, more sustainable. For this purpose, the network organisation focuses on the topics of Liveliness, Circularity, and Mobility. Until 2019, there were three workgroups with aims dedicated to these topics. Although there have been success stories in the form of smaller and larger projects, such as the green fences and the recycling walks, the impact of the workgroups has remained limited according to the organisation.

As of 2019, the interorganisational collaboration has expanded to include sixteen participating organisations and four 'Friends of the GBCU', smaller organisations participating less extensively than the other organisations. Ten of these organisations have an active member in at least one of the workgroups. The distribution of these members is inequal among the three workgroups: the workgroups Liveliness and Circularity are significantly larger than the workgroup Mobility. The diversity of organisations in the latter is also much lower than in the other workgroups. Diversity can bring both advantages and disadvantages to workgroups. Additional insights and perspectives result in higher creativity and acceptance of projects among participating organisations. However, diversity can also lead to potentially conflicting incentives and different organisational cultures. Because of this, collaboration between multiple organisations may be complicated and achieving mutually beneficial goals difficult.

## Research and Recommendations

During the upcoming years, the GBCU aims to make create impact regarding the sustainability of the area by executing more and larger workgroup projects. This study was conducted to provide recommendations for how the workgroups of the GBCU and the GBCU more generally could improve their effectiveness by examining how "home-organisation diversity", diversity in the organisations workgroup members work for, influences the development of similar team mental models in these workgroups. Team mental models are representations workgroup members have of workgroup goals and how to achieve these goals. Having similar team mental models among workgroup members is an indication of effective workgroup functioning and might be complicated or aided by high diversity. However, there appears to be no research to date on how this type of diversity influences the development of similar team mental models in inter-organisational workgroups in the context of sustainability challenges. By addressing this gap, this study can also provide recommendations to the GBCU.

Research was done between October 2018 and March 2019. The work processes of the three workgroups were analysed with the use of (1) year plans and annual reflection reports of the GBCU from the years 2015 to 2019, (2) interviews with participants in the GBCU, and (3) meetings of workgroups, GBCU board meetings, and general participant meetings. The similarities and differences between the three workgroups were compared to derive the components and processes most important for workgroup members to develop similar team mental models. This resulted in a framework on this process, including how it was impacted by home-organisation diversity in the workgroups.

By comparing the three workgroups combined with insights from research into innovation, team diversity, networking, social identity, and motivation and commitment, this study provides important recommendations for the GBCU as to how its workgroups can improve their workgroup

functioning and exploit the innovation potential of diversity in home-organisations.[1] More specifically, the study suggested that as shown by the workgroups Mobility and Circularity that a core team of three or four dedicated members can improve the functioning of the workgroup. Indeed a core team enables central decision-making and therefore efficient execution of projects. These committed members do not only have high intrinsic motivation, they are also supported by their own organisations to participate actively in the GBCU and its workgroups. The study thus concludes that it is therefore imperative to have an organisation involved in the GBCU as a whole rather than involvement being limited to one or two individuals.

Much of the GBCU's work depends on the individual effort of its members. Motivation is largely the result of (1) intrinsic motivation, (2) motivation originating in the relevance of projects towards a member's function, and (3) motivation from (the culture of) the home-organisation. Generating additional effort is difficult when motivation is relatively low. Differences in motivation and therefore involvement can make agreeing on workgroup goals and how to achieve them more difficult. In other words, home-organisation diversity can complicate the development of similar team mental models among workgroup members. This can, however, be improved by establishing means of accountability within workgroups and the GBCU more generally. The programme manager and the GBCU board can play a large role in achieving this. It is vital to clarify what can be expected from each participating member regarding effort and motivation and the reasons behind these expectations. It is also important to explicitly discuss different perspectives and incentives in this process.

Conversely, all workgroups can benefit from different perspectives brought by various participants. Actively using different perspectives does not only generate more creativity, it also results in a wider acceptance of executed projects. Discussion from multiple perspectives promotes understanding as to why some projects might not succeed. Exchanging best practices and making different incentives explicit can result in more support for and therefore more impact of projects. These benefits might also be translated in how team members develop similar team mental models as they understand each other better and can agree more easily on the goals of the workgroup and how to achieve these goals.

## Conclusion

The Green Business Club Utrecht Centraal has much potential for creating a large impact on the level of sustainability of the central station area of Utrecht, the Netherlands. Especially as the network organisation continues to grow, it can create more acceptance of its workgroups' projects. Moreover, the higher level of diversity in organisations participating in the GBCU can aid generating innovative ideas and converting them into impactful projects. The GBCU faces some challenges within the different workgroups regarding how much workgroup members agree upon the goals of their workgroup and how to achieve these goals. By creating a core team of champions in each workgroup, more concrete results can be obtained. With the addition of external support, work processes can be made more efficient and effective. It is important to set specific goals and discuss the various perspectives of participating members both within and between workgroups to aid the development of similar team mental models among workgroup members. There is large potential to make a profound impact in the area. With more effective workgroups the organisation is one step closer to achieving this.

[1] More elaborate and specific recommendations were provided to the GBCU and its workgroups in a report and presentation given in March 2019.

# 1. Introduction

Organisations are increasingly working together to increase the environmental and social sustainability of the global system (Crews, 2010; Lozano, 2015; Manning, 2017; van Huijstee & Glasbergen, 2010; Vermeulen & Witjes, 2016; WBCSD, 2010). However, sustainability challenges prove highly complex causing organisations to struggle with creating sustainable impact (Doppelt, 2003; Olsen, Sofka, & Grimpe, 2017; WBCSD, 2010). One method of increasing sustainability is through innovation and creative problem-solving (Hekkert, Suurs, Negro, Kuhlmann, & Smits, 2007; WBCSD, 2010).[2] Research into sustainable innovation has primarily focused on the individidual- (Delmas & Pekovic, 2018; Fellnhofer, 2018) and firm-levels (Mousavi, Bossink, & van Vliet, 2018; Olsen et al., 2017; Przychodzen, Przychodzen, & Lerner, 2016).

However, compared to individuals, groups have often proven to be more creative and innovative through their ability to use diverse perspectives, knowledge bases, and resources (e.g. Curşeu, Jansen, & Chappin, 2013; Harvey, 2013; Homan, van Knippenberg, Van Kleef, & De Dreu, 2007; Przychodzen et al., 2016) contributing to the performance of the firm as a whole (Guo, Pang, & Li, 2017). Especially with complex tasks (e.g. dealing with sustainability challenges such as creating circular waste systems [Olsen et al., 2017]), team diversity is an important factor influencing team performance. It allows for higher variety in knowledge bases and perspectives necessary for these tasks (Bell, Villado, Lukasik, Belau, & Briggs, 2011; Van Knippenberg, De Dreu, & Homan, 2004; Van Knippenberg & Schippers, 2007). It might therefore bring additional benefits, e.g. a more holistic solution, in the case of sustainability challenges (Olsen et al., 2017; Przychodzen et al., 2016).

The benefits of diversity in groups are, however, contested as many who have researched its effects on various team processes and performance have found inconsistent results (e.g. Webber & Donahue, 2001; Williams & O'Reilly, 1998). Examples of inconsistent results include positive and negative findings for the effects of racial diversity (Cox & Blake, 1991; Williams & O'Reilly, 1998) and the effects of gender diversity (Williams & O'Reilly, 1998) on team performance. Two main theories are used to explain these diverging effects: social categorisation and information elaboration (Van Knippenberg et al., 2004; Williams & O'Reilly, 1998). Social categorisations generally emphasise the negative influence of diversity on how group members interact with each other and the quality and creativity of their solutions (Van Knippenberg et al., 2004). Information elaboration describes the "value-in-diversity", i.e. the additional solution quality or creativity that might arise from having different perspectives (Cox & Blake, 1991). Recently, these perspectives have been combined (Edmondson & Harvey, 2017; Van Knippenberg et al., 2004) and nuanced conceptualisations of diversity have emerged (e.g. Harrison & Klein, 2007; Harrison, Price, & Bell, 1998) to better explain the varying effects of diversity on team performance. However, the various processes underlying diversity effects and the development of groups remain not clearly understood (Edmondson & Harvey, 2017; Van Knippenberg & Schippers, 2007). This complicates enhancing sustainable innovation through team diversity, yet it also creates an interesting gap in the literature which this thesis pursues.

Even more innovation potential might be found in inter-organisational groups, which might bring additional perspectives by spanning organisational boundaries. Aiming to exploit the potential of perspective diversity in inter-organisational contexts, many types of inter-organisational collaboration partnerships exist combining the expertise and perspectives of members across organisations (e.g. (Boon, Chappin, & Perenboom, 2014; Faems, Van Looy, & Debackere, 2005). According to Lozano (2007), "collaboration is about using information, divergent insights and spontaneity to solve problems and [innovate]" (p. 372). He subsequently states that collaboration allows for use of diverging views and expertise for innovation and problem-solving in inter-

[2] This thesis will henceforth refer to 'sustainable innovation and problem-solving', which includes sustainability projects, as 'sustainable innovation' for simplicity.

organisational groups. Many of these collaboration partnerships occur within value chains and relate sustainable innovation to firm performance (e.g. Faems et al., 2005; Grekova, Calantone, Bremmers, Trienekens, & Omta, 2016). Other partnerships are network-based, connecting otherwise unrelated (with respect to value chains) organisations through inter-organisational groups to enhance problem-solving. Research on inter-organisational collaborative partnerships has mainly focused at the network- and firm-levels (e.g. Faems et al., 2005) or on temporary project partnerships (cf. Bakker, 2010; Manning, 2017). Others, e.g. Boon et al. (2014), focused on the creation of knowledge rather than of concrete projects. They examined the role of transdisciplinary groups for knowledge co-creation in a research institution context. However, there seems to be no research to date on how diversity of perspectives and expertise influences inter-organisational groups in the context of sustainability challenges.

One example of an organisation using inter-organisational groups for sustainability challenges is the Green Business Club Utrecht (GBCU), a network organisation consisting of sixteen organisations. They aim to make the area around the central station of Utrecht, the Netherlands, more sustainable (Green Business Club Utrecht Centraal, n.d.). Their workgroups are focused on three corresponding areas of sustainability: Circularity, Liveliness, and (person-)Mobility. As workgroup members come from different organisations – henceforth referred to as their "home-organisation" (Ehlen, van der Klink, Roentgen, Curfs, & Boshuizen, 2014; Greer, 2017; Hietajärvi & Aaltonen, 2018), they bring diversity resulting from different organisational cultures. This thesis will refer to this type of diversity as "home-organisation diversity". Home-organisation diversity thus represents the degree of diversity within a team or workgroup because of its inter-organisational setting.

The relevance of team diversity literature for the context of inter-organisational groups seems, therefore, apparent. Moreover, there are many similar organisations to the GBCU and much attention has been paid to organisational culture as a moderator of the effects of diversity on performance within intra-organisational groups (e.g. Mannix & Neale, 2005). However, although Greer (2017) alluded to the relevance of diversity considerations for interorganisational collaboration in their dissertation, no explicit connection between team diversity and collaboration theory seem to exist to date. Using the concept of home-organisation diversity might thus provide a novel perspective on the solution-creation process of teams and workgroups in inter-organisational settings.

Home-organisation diversity constitutes the diversity in, for example, perspectives, organisational cultures, and work norms that arises from the fact that workgroup members bring different organisational experiences with them from their home-organisations (Kourti, Garcia-Lorenzo, & Yu, 2018). This implies that workgroup members from different organisations have different 'mental models', i.e. different knowledge frameworks for work (Lim & Klein, 2006; Milliken & Martins, 1996). Over time group members develop team mental models (Edmondson & Harvey, 2017). For groups to function effectively, their members should develop similar team mental models (Mohammed, Ferzandi, & Hamilton, 2010; Mohammed, Hamilton, Tesler, & Mancuso, 2015). Team mental models are knowledge structures on what a group should do, by whom it should be done within the group, and how it should be done (Marhefka et al., 2018; Mohammed et al., 2010, 2015). Team diversity might aid or hamper the development of a similar team mental model (cf. Hoever, van Knippenberg, van Ginkel, & Barkema, 2012). Especially in inter-organisational contexts, individual mental models vary (Jackson & Joshi, 2011), complicating development of similar team mental models (Cannon-Bowers & Bowers, 2011; Mohammed et al., 2010; Pearsall & Venkataramani, 2015).

Moreover, there seems to be no research to date on inter-organisational collaboration in the context of projects external to the core business of the collaborating organisations. In other words, collaborative projects that do not directly contribute to the primary functions of collaborating organisations have not been studied (cf. Manning, 2017). The work of Manning (2017) on project

network organisations (PNOs) explicates many similarities between such organisations and organisations such as the GBCU. However, the fact that in this thesis the projects are external to the participating organisations is one of the characteristics that distinguishes this network organisation from different collaboration partnerships. Therefore, the focus on the team-level in inter-organisational context for solutions of sustainability challenges in an area external but connected to the participating organisations in this thesis appears to be an under-researched area.

Combining these research gaps, this thesis examines the inter-organisational workgroups of the Green Business Club Utrecht Centraal. It aims to develop the field of team diversity research further through examining how team members from different organisations work together to create solutions for sustainability problems (Edmondson & Harvey, 2017; Horwitz & Horwitz, 2007; Van Knippenberg et al., 2004). Herein it investigates the influence of home-organisation diversity on the development of team mental models for the solution-creation process. This results in the following research question:

*How does home-organisation diversity influence the development of similar team mental models for the solution-creation process in interorganisational workgroups for sustainability challenges?*

To answer this question, multiple aspects need to be investigated giving rise to various sub-questions. These concern general insights into the functioning of the workgroups of the GBCU and specific considerations of the role of the home-organisation for a member's participation as well as the influence home-organisations might have on the functioning of a workgroup more broadly. Hereafter, the development of team mental models can be considered and the role of home-organisation diversity in this process. These considerations result in the following sub-questions:

(1) *What is the composition of each of the three workgroups regarding the degree of home-organisation diversity?*
(2) *How does each of the three workgroups function, i.e. what is their solution-creation process regarding sustainability challenges?*
(3) *What are the various components influencing the way in which a workgroup functions?*
(4) *What is the role of the home-organisation in a workgroup member's participation and the functioning of the workgroup more generally?*
(5) *How is workgroup functioning related to the development of team mental models?*
(6) *How does home-organisation diversity influence workgroup functioning?*

Providing the answers to these sub-questions allows for answering the main research question.

As detailed previously, answering this research question will give insights into (a) how team diversity affects the development of similar team mental models for the solution-creation process, which underlies team performance and is currently underexplored (Van Knippenberg & Schippers, 2007) and (b) examine the role of home-organisation diversity in this process. Additionally, it will help (c) organisations in creating and managing teams for sustainable innovation more effectively and efficiently - especially in the case of inter-organisational teams, contributing to increasing global sustainability. To achieve this, the theoretical background of this question will be elaborated upon (Chapter 2). Secondly, the methodology employed to answer this question is discussed (Chapter 3). Hereafter the research results are presented (Chapter 4) and, in the subsequent chapter (Chapter 5), discussed. This discussion includes a comparison with existing literature, consideration of the limitations of this thesis, and suggestions for future research. Lastly, Chapter 6 concludes on the research question.

# 2. Theoretical background

This chapter elaborates on the theoretical context of the research question formulated in the previous chapter. Firstly, the essential concepts of 'workgroup' and 'solution-creation process' are defined. Hereafter relevant literature on social networks and inter-organisational collaboration is briefly discussed. This is followed by a more elaborate discussion on team diversity research including development of the concept of 'team diversity' and how it can affect team processes. This also includes a discussion on home-organisation diversity specifically and the role of time in workgroup development. Fourthly, the development of team mental models is discussed. The last section summarises the research gap.

## 2.1. Workgroups and the Solution-Creation Process

There exist many definitions of the term '(work)group' (e.g. Harrison & Klein, 2007; Tröster, Mehra, & van Knippenberg, 2014; Van Knippenberg et al., 2004; Webber & Donahue, 2001), which is sometimes distinguished from (e.g. Cannon-Bowers & Bowers, 2011; Cannon-Bowers, Salas, & Converse, 1993) or, alternatively, used interchangeably with the 'team' concept. The most common difference when these concepts are distinguished is the time-based nature of teams (Cannon-Bowers & Bowers, 2011). Teams are often terminated when one or a few tasks/projects are accomplished and can thus be perceived as a subset of the 'workgroup' concept. This thesis will therefore use the more general term of 'workgroup' to describe the examined groups of individuals working together.[3] It will follow the most common elements in these definitions and define 'workgroups' as: social units of multiple individuals who share a common goal and responsibility and whose actions have some degree of interdependence (Cannon-Bowers & Bowers, 2011; Cannon-Bowers et al., 1993; Williams & O'Reilly, 1998). Workgroups thus create a shared output, whether a product or other type of solution, through a particular process to create this output (e.g. Van Knippenberg et al., 2004). This process will here be termed the 'solution-creation process'.

The solution-creation process is the process that leads to the output of a workgroup and thus consists of the behaviours of a workgroup that lead to the creation of a solution (in this case for a sustainability challenge). The solution-creation process thus includes multiple workgroup processes. One of the best models of workgroup processes, according to the extensive review by Cannon-Bowers and Bowers (2011) on workgroup development and functioning, was the work of Marks, Mathieu, and Zaccaro (2001). Marks et al. (2001) argued that team behaviours can be divided in 'transition behaviours', 'action behaviours', and 'interpersonal processes'. Transition behaviours include the analysis and planning of the group's goals, action behaviours concern activities that lead to the accomplishment of those goals, and interpersonal processes encompass conflict and affect management as well as motivation and confidence building activities (Cannon-Bowers & Bowers, 2011; Marks et al., 2001). The concept of 'solution-creation process' thus includes all three types of team behaviours in this thesis.

## 2.2. Collaboration literature

This section discusses previous research on collaborations. It highlights the role of internal and external social networks in sustainable innovation. Secondly, it introduces various previously researched constructs for inter-organisational collaboration.

[3] Many fields use the term 'team', however, to describe other phenomena including 'team diversity' and 'team mental models'. This thesis will follow this convention and as such when describing these phenomena will employ terms including the word 'team' instead of 'workgroup'.

### 2.2.1. Social Networks

As argued by Olsen et al. (2017), sustainable innovation challenges differ from other innovation challenges in that their high complexity requires diverse sets of knowledge and that they are often formulated external to the actors aiming to solve them. Brass, Galaskiewicz, Greve, and Tsai (2004) furthermore emphasised how creative and complex tasks, e.g. tasks for sustainable innovation, might benefit from network connections and Przychodzen et al. (2016) investigated how firms translate creativity into sustainability by involving diverse stakeholders. Although a detailed discussion of social network theory is beyond the scope of this thesis, the relevance of the field to the research context warrants, however, a brief elaboration here.

Social network theory (or social capital theory) states that workgroups can have social connections among themselves, i.e. internal social capital, and with people outside of the workgroup, i.e. external social capital, and that these connections result in actual and potential resources embedded in these connections (Jackson & Joshi, 2011). Similar workgroups often have more internal social capital than dissimilar workgroups, which might promote internal group processes, while dissimilar workgroups often have more diverse external social networks, which might bring more diverse resources to the workgroup (Burt, 1992; Jackson & Joshi, 2011). This was perhaps best described by Büchel, Nieminen, Armbruster-Domeyer, and Denison (2013): "The social capital view of networks reinforces the value of interconnections that bring diverse perspectives and functional backgrounds into the innovation process, such as when 'outside expertise' leads to new insights or ways of thinking about an innovation task" (p. 27). Network actors, whether internal or external to the workgroup, should all have a shared language, i.e. the same understanding of values and norms of the network, to ensure performance (Büchel et al., 2013; cf. Schneider, Ehrhart, & Macey, 2011). At the workgroup-level this implies group members should have similar mental models regarding the solution-creation process (Mohammed et al., 2010).

### 2.2.2. Inter-organisational collaboration

Increasingly, organisations collaborate with one another to complete projects or establish more permanent partnerships (e.g. Manning, 2017) and the research on inter-organisational collaboration has developed accordingly (see Greer [2017]). Research has focused on temporary inter-organisational structures (e.g. Bakker, 2010; Hietajärvi & Aaltonen, 2018; Kramer, Hoelscher, Nguyen, Day, & Cooper, 2017; Manning, 2017) and (semi-)permanent inter-organisational partnerships such as collaborative alliances (e.g. Faems et al., 2005; Grekova et al., 2016; Kourti et al., 2018; Manning, 2017; Van Hoof & Thiell, 2014). The latter group of collaborations generally concerns partnerships within supply chains (e.g. Grekova et al., 2016) and partnerships to co-create knowledge (e.g. Boon et al., 2014; Roscoe & Cousins, 2016). These types of collaboration all concern activities that apply to the core business of the collaborating organisations. For example, the temporary organisation studied by Hietajärvi and Aaltonen (2018) consisted of companies in or related to the construction sector working together on a construction project, i.e. an activity directly related to their core businesses.

There has been some research specifically into how inter-organisational collaboration can promote innovation (e.g Olsen et al., 2017). However, this work too has mainly focused on innovation and solution-creation pertaining to core business activities. For example, the recent work of Jonas, Boha, Sörhammar, and Moeslein (2018) investigated stakeholder engagement in an intra- and inter-organisational context for the co-creation of innovation with industry partners. Although there also exist types of inter-organisational collaboration that focus on projects external to the core business of the collaborating organisations (as previously discussed), these types of collaboration have received little academic attention. This thesis aims to address this research gap by examining a collaboration organisation focusing on projects and problem solutions not related to the core business of any of the participating organisations. With a focus on making a geographical area (in this case the central station

area of Utrecht, the Netherlands) more sustainable, this establishes a different context than has previously been studied by others.

## 2.3. Team diversity

This section elaborates on the development of team diversity literature over the last few decades. This includes the development of the concept, the processes through which it affects workgroup functioning and performance, and the new concept of home-organisation diversity. Throughout this section, gaps within the field are discussed.

### 2.3.1. Development of the Team Diversity Concept

The effects of team diversity on workgroup performance are often found to be inconsistent (e.g. Jackson & Joshi, 2011; Webber & Donahue, 2001; Williams & O'Reilly, 1998). For example, the effects of racial diversity on how workgroup members create solutions have been found to be both positive and negative (Milliken & Martins, 1996; Williams & O'Reilly, 1998; see also Ely and Thomas [2001]). Diversity through heterogeneity in demographics has been the main group of characteristics used to define diversity until the beginning of the 21st century (Jackson & Joshi, 2011; Williams & O'Reilly, 1998). A second group of characteristics concerns what Pelled and colleagues (Pelled, 1996; Pelled, Eisenhardt, & Xin, 1999; Simons, Hope Pelled, & Smith, 1999) termed 'job-related diversity'. This is heterogeneity at the group-level regarding attributes, such as educational background, that are presumed to influence the work of people more directly than demographic attributes (Pelled et al., 1999; Van Dijk, Van Engen, & Van Knippenberg, 2012).

In these studies, both demographic and job-related diversity have been assumed to represent underlying characteristics of individuals, i.e. their perceptions of the world and their perspectives towards it (Jackson & Joshi, 2011). However, towards the turn of the century, Harrison et al. (1998) argued for explicitly considering these underlying characteristics as the field of team diversity research kept producing inconsistent and contradictory results regarding the effects of "readily detectable attributes" (Harrison et al., 1998, p. 97) on how workgroups work together (cf. Horwitz and Horwitz [2007]). They termed these attributes 'surface-level diversity', while non-visible attributes make up 'deep-level diversity' (Harrison et al., 1998). Deep-level diversity can be further divided into relational-related attributes, e.g. personality, and task-related attributes, e.g. mental models (Jackson & Joshi, 2011).[4] Table 1 depicts how the term 'diversity' can be divided in these types, including examples of attributes belonging to these types. A further investigation into deep-level diversity could provide insights into underlying influences on performance in addition to effects of surface-level diversity, for example in the work of Curşeu, Chappin, and Jansen (2018).

[4] It should be noted that Jackson and Joshi (2011) actually used a two-dimensional matrix for their taxonomy of team diversity. One dimension was surface-deep level diversity and the other concerned relation-task diversity. In their terminology, demographic diversity would thus be surface-level relational diversity while job-related diversity would be surface-level task diversity. However, to prevent conceptual confusion, this thesis follows many other researchers (e.g. Van Dijk et al., 2012) in using the terms of demographic and job-related diversity instead. As no equivalent terms seem to exist for dividing deep-level diversity, the division of relational and task is still made there.

*Table 1: Conceptualisation of Diversity Types*

| Primary Type of Diversity | Secondary Type of Diversity | Example Attributes |
|---|---|---|
| Surface-Level | Demographic | Gender; Age |
| | Job-Related | Educational Background; Organisational Tenure |
| Deep-Level | Relational | Personality; Attitudes |
| | Task | Communication Skills; Mental Models |

### 2.3.2. Different Effects of Diversity Dimensions

Despite the inclusion of underlying characteristics as measures of diversity, many researchers have argued that the vague term 'diversity' itself is limiting the development of the field (e.g. Bunderson & Van der Vegt, 2018; Harrison & Klein, 2007; van Knippenberg & Schippers, 2007). According to them, it obscures variations in the effects different attributes can have on how workgroup members work together. They argue that many researchers do not consider how operationalising diversity simply as 'degree of variation' might complicate future research through perpetuating the confusion around the term. To unpack the concept of diversity (Van Knippenberg & Schippers, 2007), multiple researchers have reconceptualised the term, most notably Harrison and Klein (2007) and Bunderson and Van der Vegt (2018), who built on their work. Bunderson and Van der Vegt (2018) propose diversity is an umbrella term consisting of three different types with diverging impacts: variety, separation, and skew (cf. Harrison & Klein, 2007). All three types could include surface- and deep-level diversity attributes, depending on how these attributes manifest themselves in how individuals and groups react to them (see also Harrison and Klein [2007]).

Figure 1 shows a graphical representation of these types of diversity. Diversity as variety is a qualitative type of diversity: there is no high or low value of the considered attribute. As such, high variety is indicated by different symbols rather than positioning of these symbols. High variety includes an even spread across all possible categories. Variety, as Harrison and Klein (2007) hypothesize, can be associated with vital consequences for the workgroup as it "broadens the cognitive and behavioural repertoire of the unit" (p. 1204). Separation entails (1) that units differ in a single continuous attribute (e.g. organisational commitment or age), (2) that members of units might be spread along this attribute continuum to varying degrees, and (3) that this spread along the continuum leads to "systematic consequences", e.g. higher or lower cohesion (Harrison & Klein, 2007, p. 1203). Separation is assumed to have symmetric effects: little diversity is an advantage independent of the position on the continuum that is shared. The last type of diversity, skew, is similar to separation in that both consider the position of individuals along a horizontal spectrum.[5] However, skew entails the degree to which one individual (or a small group of individuals) is positioned at one end of the attribute spectrum while all others are at the opposite end of the spectrum (Bunderson & Van der Vegt, 2018).

[5] As becomes clear from the figure, there is no difference between low separation and skew.

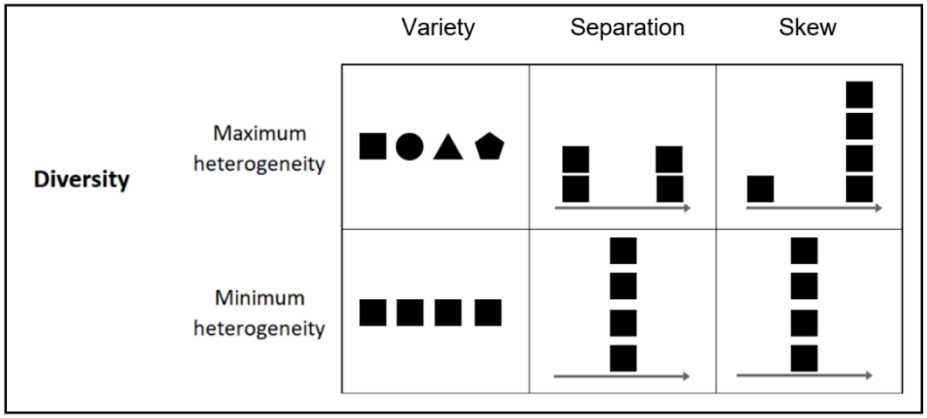


*Figure 1: Types of Diversity (based on Bunderson and Van der Vegt [2018])*

### 2.3.3. Social Categorisation and Information Elaboration

There exist many distinct and related theories on the effects of team diversity on how workgroup members work together and perform. This thesis will focus on the two most prevalent perspectives (Van Knippenberg et al., 2004; Williams & O'Reilly, 1998). The first perspective posits that a more diverse workgroup allows for more perspectives and alternatives (Van Knippenberg & Schippers, 2007) and this richer information base enhances the workgroup's ability for problem solving (Jackson & Joshi, 2011; Joshi & Roh, 2009; Van Knippenberg et al., 2004; Williams & O'Reilly, 1998). This idea of "value-in-diversity" was most explicitly considered by Cox and Blake (1991), who argued it could create competitive advantage through managing inevitable consequences and cultivating opportunities. This perspective aims to use diversity in perspectives, information, and resources for more innovative and creative problem-solving (Van Dijk et al., 2012; Van Knippenberg et al., 2004). This can be achieved through the process of information-elaboration, which includes the "exchange, discussion, and integration of ideas, knowledge, and insights relevant to the group's task" (Van Knippenberg et al., 2004, p. 1010).

The second perspective, however, predicts negative effects on workgroup performance as argued by Williams and O'Reilly (1998).[6] Social categorisation emphasises how individuals aim to maintain high self-esteem through first a "process of self-categorisation in which they classify themselves and others into social categories using salient characteristics" (Williams & O'Reilly, 1998, p. 83/84). This results in a self-identity as part of a group (in-group) through which an individual aims to maximise intergroup (in-group versus out-group) distinctions (Hornsey & Hogg, 2000; Tröster et al., 2014; Van Knippenberg et al., 2004; Van Knippenberg & Schippers, 2007). Increased diversity might result in an 'us versus them' mentality (Mannix & Neale, 2005; Van Knippenberg, Van Ginkel, & Homan, 2013; Williams & O'Reilly, 1998) in turn causing communication difficulties and conflict to occur (Bell et al., 2011; Harrison & Klein, 2007; Horwitz, 2005; Jackson & Joshi, 2011).

[6] Although Williams and O'Reilly (1998) consider social categorisation and self-categorisation identical processes, social identity theory differentiates between the two (e.g. Hogg & Terry, 2000; Hornsey & Hogg, 2000). Social categorisation is the general process of dividing individuals in distinct identity groups. Self-categorisation, on the other hand, is more specific and includes creating prototypes (or stereotypes) for these social categories. Prototypes are the context-dependent features that define 'group membership'. Moreover, as the name suggests, self-categorisation applies the social categorisation process to the self; it "assimilates [the] self to the ingroup prototype" (Hogg & Terry, 2000, p. 123). This thesis will, however, follow the main body of team diversity literature (e.g. Williams and O'Reilly [1998] and Van Knippenberg et al. [2004]) in using the more general term of 'social categorisation' to avoid conceptual confusion.

### 2.3.4. Integrating Social Categorisation and Information Elaboration

Information elaboration and social categorisation have mainly been discussed in isolation. However, Van Knippenberg et al. (2004) posited that social categorisation might actually moderate the information-elaboration process. They integrated the two perspectives in a new framework through which to study the relationship between team diversity and workgroup outcomes: the categorisation-elaboration model (CEM). They propose that there is an interplay between the processes of social categorisation and information-elaboration, giving rise to either positive, negative, or neutral effects depending on how these processes unfold. Moreover, they postulate that social categorisation itself need not result in negative effects on how workgroup members work together as it might lead to individuals being more aware of their differences, potentially creating an environment in which they more actively engage with multiple perspectives (Van Knippenberg & Schippers, 2007). In this way, social categorisation might enhance information-elaboration and in turn the solution-creation process of the workgroup (Van Knippenberg et al., 2004).

Edmondson & Harvey (2017) build on the work of Van Knippenberg and colleagues (e.g. Van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007) in connecting the processes of social categorisation and information elaboration through the idea of group 'boundaries'. They considered the case of knowledge diversity, a deep-level characteristic that might elicit consequences associated with all three types (separation, variety, and skew) of diversity (Bunderson & Van der Vegt, 2018; Edmondson & Harvey, 2017; Harrison & Klein, 2007; Harrison et al., 1998). Knowledge diversity causes boundaries between individuals, which can occur at different intensities: syntactic - differences in language, semantic - differences in interpretation, and pragmatic - differences in interests (Carlile, 2002; Edmondson & Harvey, 2017). These boundary intensities influence how individuals and the whole workgroup develop new characteristics as workgroup members work together. Additionally, the intensity of these boundaries determines the difficulty of collaboration, i.e. more intense boundaries hamper collaboration.[7]

### 2.3.5. Home-Organisation Diversity

The discussion on boundaries and their effects on collaboration is especially relevant in the current research context on inter-organisational rather than intra-organisational collaboration. Organisational types, cultures, and structures all contribute to individuals' perspectives in workgroups (Guillaume, Dawson, Otaye-Ebede, Woods, & West, 2015; Mannix & Neale, 2005). In intra-organisational workgroups, this is shared among the various workgroup members (limiting the possibility for boundaries). In inter-organisational workgroups, on the other hand, workgroup members come from different home-organisations which potentially affects collaboration (Ehlen et al., 2014; Hietajärvi & Aaltonen, 2018). As discussed in the introduction, home-organisations are the organisations workgroup members get paid to work, while the organisation in which they do collaborative work is external to that organisation (Hietajärvi & Aaltonen, 2018). These differences result in what this thesis refers to as "home-organisation diversity".

[7] Although a full elaboration is beyond the scope of this thesis, here a connection can be made with the work of Shotter (2005a, 2005b, 2006) on what he called 'withness'-thinking and the work of Carlile (2002) and Edmondson and Harvey (2017) on knowledge boundaries. In his work, Shotter (2005a, 2005b, 2006) followed Wittgenstein in the idea that the meaning of words is shaped by their grammar, their context, and thus their use. What meaning individuals then attribute to words when in dialogue with others, whether one other or multiple others, is created by their expectations, their assumptions. The background and experiences of individuals shape their mental models and the language – whether literally or figuratively – through which they perceive the world and conduct work (Shotter, 2005b; Milliken & Martins, 1996; Carlile, 2002; Schneider et al., 2011). Therefore, the meaning different individuals give to something might not be equal as their context, i.e. their experience, is not identical. Differences in language create boundaries between individuals (Carlile, 2002; Shotter, 2006) in line with the knowledge boundaries introduced by Carlile (2002) and examined by Edmondson and Harvey (2017).

Although home-organisation (HO) diversity can be considered a surface-level attribute, it gives rise to deep-level diversity characteristics (Harrison et al., 1998). These include the different perspectives of work norms and organisational culture obtained by individuals through their work experience, i.e. their mental models (see Section 2.4). As argued in collaboration literature, members of inter-organisational workgroups experience differences in organisational perspectives (e.g. Boon et al., 2014; Faems et al., 2005; Hicks-Clarke & Iles, 2000; Kramer et al., 2017; Schneider et al., 2011). In other words, in inter-organisational workgroups HO diversity appears to be able to manifest itself as variety (Bunderson & Van der Vegt, 2018; Harrison & Klein, 2007).

Home-organisations influence the values, perceptions, and mental models of individuals through organisational culture (e.g. Lim & Klein, 2006; Milliken & Martins, 1996; Saks & Ashforth, 1997; Schneider et al., 2011).[8] This makes HO diversity similar to knowledge diversity discussed above. Following the logic of Edmondson and Harvey (2017), HO diversity might therefore cause prevalent boundaries within workgroups complicating workgroup communication through social-categorisation and with this limiting information-elaboration. This manifestation of HO diversity could then be most readily associated with separation and skew (Bunderson & Van der Vegt, 2018). How HO diversity influences the solution-creation process might thus depend on how it manifests itself: as variety, separation, or skew.

### 2.3.6. Development of Workgroups over Time

The relationship between team diversity and the solution-creation process can change over time (e.g. Harrison, Gavin, & Florey, 2002; Horwitz & Horwitz, 2007; Jackson & Joshi, 2011). However, not many studies have investigated the actual development of workgroup processes over time - rather than retrospectively (e.g. Horwitz & Horwitz, 2007) - and explicitly considered diversity. There are a few notable exceptions. In their early work, Watson, Kumar, and Michaelson (1993) studied the effect of cultural diversity on workgroup interaction and problem-solving performance. Almost a decade later, Harrison, Gavin, and Florey (2002) examined the effects of surface- and deep-level diversity on group functioning over time in student teams. More recently still, Farh, Lee, and Farh (2010) distinguished between early and later phase effects of task conflict (resulting from diversity) on workgroup creative performance and Büchel et al. (2013) examined the processes underlying 'team-stakeholder networking' and shared cognitions throughout the workgroup interaction. All employed quantitative methods to examine the influence of time on workgroups.

Building on these previous studies examining the role of time in workgroups, Edmondson and Harvey (2017) stated that certain characteristics of workgroups only emerge over time. The recent work of Li, Meyer, Shemla, and Wegge (2018) went even further in noting the dynamic nature of team diversity beyond emergent properties of workgroups. They stated that workgroups, often conceived of as stable entities, generally have a flexible membership in organisations (Li et al., 2018). This affects team diversity as the addition, subtraction, or substitution of workgroup members can increase or reduce the variety, separation, or skew within a workgroup. Based on these deductions, they created the Dynamic Team Diversity Theory (DTDT), which establishes propositions on how these alterations in diversity affect the team mental model (TMM) of a workgroup, its identity, and its coordination patterns. In their theoretical work they call for future work to evaluate these propositions and, more generally, explore the effects of dynamic team diversity on TMMs, identity, and coordination patterns both in laboratory settings and in the field. Time alone is thus not enough for groups to get 'on the same page' (Mohammed et al., 2010). This thesis follows this call in its research focus on HO diversity

[8] Organisational climate is another factor influencing these characteristics. This "concerns the policies, practices, and procedures as well as the behaviours that get rewarded, supported, and expected in a work setting and the meaning those imply for the setting's members" (Schneider et al., 2011, p. 373). However, for the purposes of this thesis, the focus is on organisational culture.

and TMMs. For the purposes of keeping an overview of the extensive literature on team diversity, Figure 2 depicts a simplified timeline of this field of research.

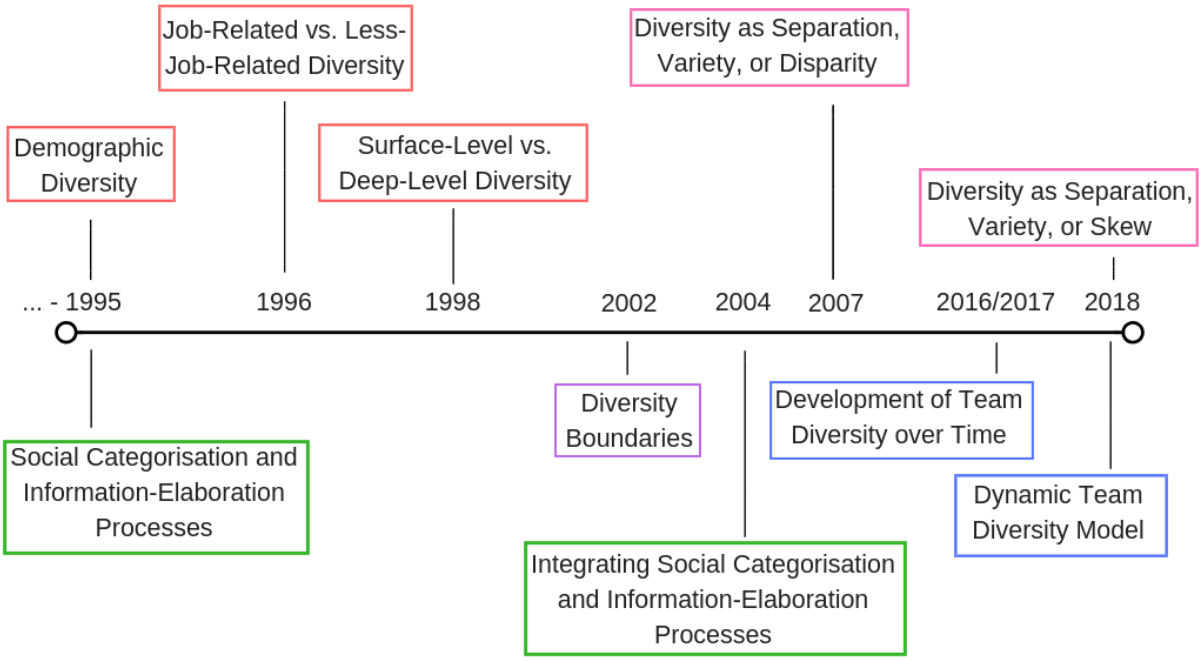


*Figure 2: Timeline of Research on Team Diversity*

## 2.4. Team Mental Models

As mentioned in previous sections of this chapter, mental models are a deep-level characteristic of individuals originating in their past experiences. They are structured patterns of knowledge that enable individuals to explain the relationships of system components and the behaviour of the system as a whole; additionally, they allow individuals to create expectations of these relationships and behaviour and to respond and act accordingly (Cannon-Bowers et al., 1993; Li et al., 2018; Mohammed et al., 2010). Diversity in mental models might cause boundaries between individuals, which should be overcome to create an effective workgroup (Boon et al., 2014; Carlile, 2002; Edmondson & Harvey, 2017; Milliken & Martins, 1996). This means that a shared understanding, e.g. of workgroup goals (Cannon-Bowers & Bowers, 2011; Mohammed et al., 2010), needs to be established. Through learning behaviours individuals' understanding of the problem and each other can be broadened. This can result in the development of a 'shared mental model' (Cannon-Bowers & Bowers, 2011; Edmondson & Harvey, 2017; Mohammed et al., 2010; Van Ginkel & Van Knippenberg, 2012).

The term 'shared mental model' was first coined by Cannon-Bowers and colleagues (Cannon-Bowers et al., 1993; Cooke, Salas, Cannon-Bowers, & Stout, 2000) who used it to describe the knowledge shared across workgroup members allowing for understanding of work requirements and predicting the needs and actions of other workgroup members.[9] As argued by Mohammed et al. (2010), 'sharedness' is an ambiguous term and they therefore recommend using the term 'team mental model' (TMM). A TMM is a "shared, organized understanding and mental representation of knowledge about key elements of the team's relevant environment" (Mohammed et al., 2010, p. 879).

[9] The terms 'shared mental model' and 'team mental model' have often been used interchangeably (e.g. Lim & Klein, 2006). However, as argued in this section as well as by other previously, the latter is generally preferred. Cannon-Bowers et al. (1993) argued that a team might not need a fully shared mental model but rather complementary mental models to work together effectively. Moreover, shared mental models might be inaccurate limiting the effectiveness of a team rather than enhancing it (Lim & Klein, 2006). This thesis therefore uses the term 'team mental model' and refers to its similarity among members rather than its 'sharedness'.

When group members have similar TMMs, their structured representations of the goals of the workgroup, i.e. taskwork, and the way in which these goals are to be achieved, i.e. teamwork, are similar (Aubé, Rousseau, Brunelle, & Marques, 2018; Marhefka et al., 2018; Mohammed et al., 2010, 2015).

Given the context of inter-organisational collaboration, the definition of (similar) TMMs used in this thesis includes a similar representation of organisational/workgroup goals and work processes for the creation of sustainable solutions within the collaboration organisation. In other words, similar TMMs are achieved when workgroup members have the same understanding of the goals of the group and the organisation as well as of how to achieve these goals. The processes that lead to similar TMMs predominantly include processes of establishing a shared goal (transition), coordination or communication (action), and management of conflict as well as the generation of collective confidence and motivation (interpersonal) (Cannon-Bowers & Bowers, 2011; Marks et al., 2001). This focus is in line with the processes Van Knippenberg et al. (2004) considered for their model (discussed in Section 2.3.4.) on the effects of team diversity on workgroup output, namely social categorisation and information elaboration.

Cooke, Salas, Cannon-Bowers, and Stout (2000) built on this by adding that TMMs include the task- and team-knowledge of workgroup members. This is knowledge pertaining to what tasks there are and how to execute them as well as knowledge relevant for how to work together as a group, respectively. These two sets of knowledge represent distinct mental models, a taskwork and a teamwork mental model, affect the workgroup in different ways (Mohammed et al., 2010). “Such knowledge is acquired by team members through formal training, experience, team discussions, and other similar methods and is relatively long lasting” (Cooke et al., 2000, p. 153). These experiences logically arise when working within organisations and workgroups. Organisational culture thus shapes mental models of individuals (see below).

Organisational culture is the “beliefs, ideologies, and values, and the ways these are transmitted through symbols, language, narratives […], and practices (Schneider et al., 2011, p. 373). It thus influences the mental models and perspectives of individuals within organisations (see also Jackson and Joshi [2011]). Culture can be influenced by the organisation and workgroups themselves (e.g. Hicks-Clarke & Iles, 2000; Jackson & Joshi, 2011; Mannix & Neale, 2005; Schippers, Den Hartog, Koopman, & Van Knippenberg, 2008; Schneider et al., 2011). As such, consideration of organisational culture can provide practical insights into how to exploit the diversity potential of workgroups more effectively. Developing similar TMMs might thus be especially relevant for an effective solution-creation process in cases of inter-organisational workgroups (see also Lim and Klein [2006] and Milliken and Martins [1996]).

In the case of inter-organisational workgroups, there are (at least) two cultures at work for each workgroup member, namely that of the workgroup and the home-organisation (HO). Both shape the mental models of workgroup members simultaneously, which might lead to difficulty in establishing similar TMMs. There is not one set of goals and processes to achieve goals – as is the case in intra-organisational contexts – but multiple as goals of the workgroup (as well as collaboration organisation) and the HO might not overlap. This can lead to so-called asymmetric goals (Pearsall & Venkataramani, 2015). Asymmetric goals in workgroups exist when “team members have divergent, and sometimes even conflicting, interests in a given situation, while still possessing a shared team objective” (p. 735). Workgroups with asymmetric goals might experience both advantages and disadvantages from these different goals. As with team diversity attributes, asymmetric goals have the advantage of bringing in more perspectives; however, they might also lead to group conflict (Pearsall & Venkataramani, 2015).

Organisations that contain multiple mental models, e.g. cultural ones as in Hogg and Terry (2000), need to either focus on the group-level TMM[10] or balance the multiple (distinct) mental models present according to Kourti et al. (2018). In (team) diversity research terminology, the former emphasises convergence, an assimilation of multiple subcultures or mental models into an overarching one, while the latter allows for divergent perspectives, i.e. focusing on the "value-in-diversity" by embracing differences. In the former case, there should be a cross-cutting structure that minimises boundaries by ensuring that people from similar groups do not also hold the same organisational roles (cf. (Tröster et al., 2014; Van Knippenberg et al., 2004; Van Knippenberg & Schippers, 2007). This emphasises the group-level over the individual (or home-organisation) mental models (see also Cannon-Bowers and Bowers [2011] on 'third culture'). The other approach includes balancing mental models at lower and higher levels of the organisation (Hogg & Terry, 2000; see also Footnote 9).

Another method of coping with multiple mental models within an inter-organisational team was found by Hietajärvi and Aaltonen (2018) in their research on a Finnish railroad construction project. The team they examined was able to distance their activities in the inter-organisational context from their work at their HO, allowing for the development of similar TMMs completely separate from their work at the HO. These different perspectives suggest that which strategy creates the most benefits for the organisation or group, might depend on the context in which individuals interact (Hornsey & Hogg, 2000; Kourti et al., 2018). This interplay between the multiple mental models makes the influence of organisational culture especially relevant for the current thesis, which examines the solution-creation processes of three workgroups in an inter-organisational context. According to Schneider et al. (2011), there was not yet any research on "what happens when all of those [cultures/mental models] simultaneously exist" (p. 396) and apart from the mentioned work of Kourti et al. (2018) and Hietajärvi and Aaltonen (2018) there still seems to be no research to date exploring this.

## 2.5. Research Gap

Throughout this chapter gaps in the literature were identified. This section combines these to delineate the specific research gap addressed in this thesis. As mentioned in the introduction, no research seems to have investigated to date the influence of diversity in home-organisations within inter-organisational workgroups on the solution-creation process, whether through mental models or otherwise. Therefore, the solution-creation process as affected by the development of similar team mental models (TMMs) as influenced by home-organisation (HO) diversity is not yet understood. This thesis therefore aims to address this gap. It aims to do so in the context of sustainable innovation, complementing work on sustainable innovation at the individual- (Delmas & Pekovic, 2018; Fellnhofer, 2018) and firm-levels (Mousavi et al., 2018; Olsen et al., 2017; Przychodzen et al., 2016). Moreover, it aims to create a theoretical framework on similar TMM development as influenced by HO diversity. This thesis therefore focuses on the role of organisational context (through culture) on HO diversity in relation to the solution-creation process (see also Mannix & Neale [2005] and Schippers, Den Hartog, Koopman, and Van Knippenberg [2008]). This results in the research question introduced in the first chapter:

> *How does home-organisation diversity influence the development of similar team mental models for the solution-creation process in interorganisational workgroups for sustainability challenges?*

[10] A group-level TMM is another phrasing of the aggregate of all similarities between the various team mental models present in a workgroup.

Several components are vital for answering this question. Firstly, the history of the workgroups needs to be examined, including changes over time up to the present. This includes the degree of HO diversity in the investigated workgroups, how workgroup members were affected by this diversity, and how workgroups have developed more generally (i.e. regarding workgroup goals and working processes). Secondly, the further development of the workgroups is followed throughout the research period. Here the emphasis is on the development of goals and workgroup processes and the workgroup members' similar understanding of these. This includes ongoing experiences of workgroup members regarding HO diversity and its effects on their working together. Insights into these factors provides answer to various sub-questions posited in Chapter 1, namely:

(1) *What is the composition of each of the three workgroups regarding the degree of home-organisation diversity?*
(2) *How does each of the three workgroups function, i.e. what is their solution-creation process regarding sustainability challenges?*
(3) *What are the various components influencing the way in which a workgroup functions?*

Additionally, there is a focus on the mental models present in the workgroups, which include their attitudes toward HO diversity, sustainability, and workgroup dynamics. The influence of the home-organisation on mental models is examined here by answering the following sub-questions:

(4) *What is the role of the home-organisation in a workgroup member's participation and the functioning of the workgroup more generally?*
(5) *How is workgroup functioning related to the development of team mental models?*
(6) *How does home-organisation diversity influence workgroup functioning?*

After answering these sub-questions, the main research question can be answered by combining the insights from all sub-questions and therewith examining the role of home-organisation diversity in TMM development. The next chapter will elaborate on the methodology employed to address the established research gap.

# 3. Methodology

This chapter will elaborate on the methodology used to develop theory on the influence of home-organisation (HO) diversity on the development of similar team mental models (TMMs). To achieve this, it will first describe the collaboration organisation and its workgroups. Secondly, the research design is elaborated upon including methods of data collection and analysis and sampling strategy. The chapter will conclude with a discussion on research quality indicators.

## 3.1. Organisational Context

The Green Business Club Utrecht Centraal (GBCU) is one of the charters of the Green Business Club Nederland (Green Business Club Utrecht Centraal, n.d.). The GBCU is a network collaboration organisation aiming to increase the sustainability of the central station area of Utrecht, the Netherlands, (Figure 3) through collaboration between organisations in the area. Founded in 2014, fifteen organisations (of which one the Utrecht municipality) participated in the GBCU during the research period.[11] These organisations span different industry fields from government to consultancy and from public transport to event management. Table 2 provides an overview of the participating companies, their sizes, and their industries. Participating companies have one organisational representative (or spokesperson) partaking in general participant meetings of the GBCU. This person is also expected to contribute to one of the workgroups of the GBCU (see below). Some organisations have multiple active members with one representing the organisation and others (solely) participating in the workgroups.

*Figure 3: Utrecht Central Station Area (wtcutrecht.nl)*

[11] Friends of the GBCU are smaller organisations participating less extensively than the other organisations.

*Table 2: Overview of Participating Organisations during the Research Period*

| Name of Organisation | Size (Number of Employees) | Sector | Activities (sources: organisation websites) |
|---|---|---|---|
| **Alexandrite** | >1450 | Real Estate | Creation of real estate and housing solutions, from strategic advice to technical advice |
| **Amethyst** | >3000 | Government | Governing of municipality |
| **Aquamarine** | >510 | Event Organisation | Creation and facilitation of events (for stimulation of trade and the Dutch economy) |
| **Citrine** | ~45 | Cinema | Showing newly released movies and special events |
| **Garnet** | >1200 | Real Estate | Providing expertise in development and active management in the retail market for shopping centres |
| **Jade** | ~1000 | Consulting | Advice on rail, space, mobility, and infrastructure projects |
| **Lapis Lazuli** | Unknown (small) | Hospitality / Tourism | Hotel chain |
| **Moonstone** | >36000 | Transport | Public transport |
| **Morganite** | >300 | Transport | Building and maintenance of traintracks and coordination of train traffic |
| **Onyx** | >43000 | Banking / Finance | Financial services |
| **Opal** | >6000 | Consulting | Advice on project management |
| **Pearl** | Unknown (large) | Government | Supporting entrepreneurs through subsidies and knowledge sharing |
| **Peridot** | Unknown (small) | Restaurant | Circular restaurant service |
| **Rubellite** | >120 | Event Organisation | Organisation of music events |
| **Spinel** | >3200 | Banking / Finance | Organisation of four financial banking brands |
| **Tanzanite** | Unknown (small) | Project Management | Project management for increasing liveliness of temporary spaces |
| **Topaz** | Unknown (small) | Network Organisation | Organisation of network events and support for new initiatives for a greener, healthier, and smarter city |
| **Tourmaline** | Unknown (small) | Innovation Consulting | Advice on innovation and social change in organisations |
| **Turquoise** | Unknown (small) | Real Estate | Renting of (flexible) office spaces, meeting rooms, and business addresses |

All individuals contributing to the GBCU fulfil their tasks within this organisation in addition to their ordinary work at their home-organisations. Only the programme manager (introduced below) is structurally paid (part-time) for their work at the GBCU. Workgroups might, however, hire external support or be provided external support by a collaboration partner in the form of project managers. The participating individuals at the GBCU focus on three separate areas to increase sustainability of

the Utrecht Centraal area: Circularity, Liveliness, and (person-)Mobility. The three workgroups examined in this thesis all have distinct goals described in the organisation's year plans. Each area has its own workgroup consisting of members from multiple organisations. This creates diversity regarding home-organisation in each group and thus ensures that the influence of HO diversity on the development of similar team mental models can be examined in-depth in each group. Each workgroup is coordinated by a chairperson. External to the workgroups, a programme manager coordinates the organisation, conducts internal and external communication, and connects the participating organisations with the GBCU board. The GBCU board establishes the course of action for the entire organisation and consists of a chairperson, a secretary, and a treasurer. Figure 4 shows the organisational structure of the GBCU.

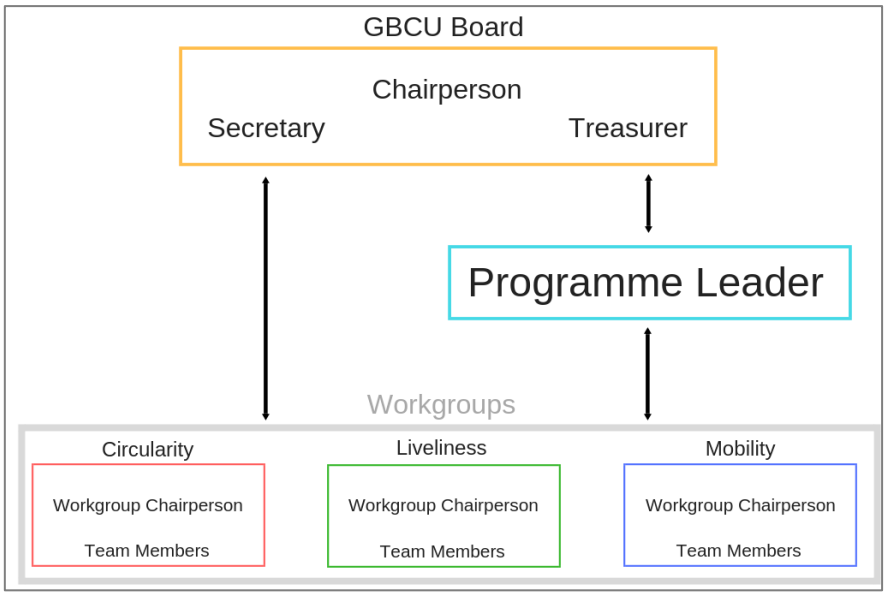


*Figure 4: Organisational Structure Green Business Club Utrecht Centraal*

### 3.1.1. Workgroup Circularity

The workgroup Circularity encompasses two topics: waste/recycling and goods transport.[12] In the 2018 year plan (YP2018) the workgroup goals were described as follows: "the reduction and structuring of waste streams at the participants and in the area around the central station as well as reducing the $CO_2$ emissions of goods transport by 25% by 2020." The goal of the workgroup was set more ambitiously with regards to goods transport during the research period as the aim became to "work on reducing, making smarter, and making cleaner the goods transport streams in the area around the station in order to reduce the $CO_2$ emissions as much as possible with the intention of zero emissions in 2025" (YP2019). The workgroup consisted of ten members from eight different organisations. This changed slightly during the research period with the member base comprising eight members from six organisations by early 2019 of which seven were longer group tenure members (at least one year of participation in the workgroup).[13] Table 3 provides an overview of the member base of this workgroup.

[12] Although the workgroup has been divided into two workgroups as of the beginning of 2019, this thesis will consider the workgroup as one entity as this division only occurred near the end of the research period. Moreover, the member base of the two workgroups is nearly identical with two key individuals (see Results) remaining active in both workgroups simultaneously.

[13] These numbers are based on the new workgroup goods transport. The member base is nearly identical for the new group of zero waste with all members but for one individual being active in this group as well. This one individual is external support for the goods transport project (more on this in Results).

*Table 3: Member Base Overview Workgroup Circularity*

| **Circularity** | Workgroup Size | Number of Represented Home-Organisations | Number of Represented Industries |
|---|---|---|---|
| Year Plan 2018 | 10 | 8 | 5 |
| Year Plan 2019 | 8 | 6 | 4 |

### 3.1.2. Workgroup Liveliness

The workgroup Liveliness had the goal of "contributing to the temporary and (semi-)permanent increase of Liveliness at Utrecht Centraal" (YP2018). This goal did not change as of 2019. Contrary to the other workgroups, the goal of the workgroup Liveliness is not quantifiable. The workgroup experienced a shift in member base during the research period with the number of participating individuals changing from nine to eight and the number of different organisations represented changing from nine to eight. More importantly, however, new individuals entered the workgroup as the representatives of various organisations changed during the year. Additionally, the chairperson of the workgroup also changed during 2018. Table 4 provides an overview of the member base of this workgroup during the research period.

*Table 4: Member Base Overview Workgroup Liveliness*

| **Liveliness** | Workgroup Size | Number of Represented Home-Organisations | Number of Represented Industries |
|---|---|---|---|
| Year Plan 2018 | 9 | 9 | 7 |
| Year Plan 2019 | 8 | 8 | 7 |

### 3.1.3. Workgroup (Person-)Mobility

The workgroup (person-)Mobility (hereafter referred to as simply 'Mobility') had a goal of "stepwise making the (home-work) Mobility of employees and visitors clean and more sustainable with a $CO_2$ emission reduction of at least 25% toward 2025" (YP2018). Similar to the workgroup Circularity, this goal changed in the year plan of 2019 to create a more ambitious (and still quantifiable) end goal for the workgroup. The workgroup now aims to "reduce the $CO_2$ emissions of person-Mobility of employees as well as visitors of the participating organisations with the intention of zero emissions in 2030" (YP2019). The member base of the workgroup is smaller compared to the other two groups with four members and three represented organisations. One new member (of a different organisation) joined the group toward the end of the research period, while another member left the workgroup around the New Year. The group is still looking for an additional member as of the end of the research period. Table 5 provides an overview of the member base of this workgroup during the research period.

*Table 5: Member Base Overview Workgroup Mobility*

| **Mobility** | Workgroup Size | Number of Represented Home-Organisations | Number of Represented Industries |
|---|---|---|---|
| Year Plan 2018 | 4 | 3 | 3 |
| Year Plan 2019 | 4 (5) | 3 | 3 |

## 3.2. Research Design

Most team diversity research and reviews of such research have employed quantitative methods to assess team diversity and its effects on team processes and performance (e.g. Horwitz & Horwitz, 2007). However, these methods provide a static perspective (Bryman, 2016; Ericksen & Dyer, 2004), while qualitative methods can provide insights into dynamic processes (Bryman, 2016; Miles & Huberman, 1984; Van Knippenberg & Schippers, 2007). Combined with a more longitudinal approach, causal relationships – as opposed to correlations – can be identified (Aubé et al., 2018; Bryman, 2016; Harrison, Mohammed, McGrath, Florey, & Vanderstoep, 2003; Marks et al., 2001). Qualitative methods and longitudinal research designs have often been used for research on social identity for these reasons (e.g. Svenningson & Alvesson, 2003).

Moreover, as the current research context consists of three workgroups with a changing member base the need to have insight into the dynamics of how HO diversity in these workgroups influences the development of similar team mental models (TMMs) might be best captured using qualitative methods. They allow for dynamic and detailed insights into team development as well as the influence of mental models on team processes as impacted by HO diversity as is the aim of this thesis (Bryman, 2016; Eisenhardt, 1989; Miles & Huberman, 1984; cf. Ely & Thomas, 2001). Quantification is only employed to assess the degree of HO diversity in each workgroup objectively, allowing for direct comparison between workgroups.

To explore the influence of HO diversity on the development of similar TMMs for the solution-creation process, this thesis will use a Grounded Theory approach (Eisenhardt, 1989; Glaser & Strauss, 1967; Strauss & Corbin, 1994). Underlying Grounded Theory is a (social) constructionism ontology, i.e. the idea that "social phenomena and their meanings are continually being accomplished by social actors" (Bryman, 2016, p. 689). The main characteristic of Grounded Theory is that of generating theory directly from the data (Glaser & Strauss, 1967; Strauss & Corbin, 1994). This methodology enables the researcher to construct theory founded on the patterns of actions and interactions between social units, e.g. groups and individuals (Strauss & Corbin, 1994). Grounded Theory is concerned with discovering processes (Strauss & Corbin, 1994) and is, therefore, especially suitable for answering the research question at the centre of this thesis. In this approach, theory continuously develops and deepens through simultaneous data collection and data analysis (see below; Corbin & Strauss, 1990; Glaser & Strauss, 1967; Strauss & Corbin, 1994). This ensures that theory developed through a Grounded Theory approach is conceptually dense, including many concepts and relationships between concepts to aim to explain the full variation of observations (Corbin & Strauss, 1990; Strauss & Corbin, 1994).

This thesis used a field-based, multiple-case study methodology (based on work by Eisenhardt [1989] and Yin [2013]) and closely followed the methodology of Ericksen and Dyer (2004). They generated Grounded Theory on the life cycle of six project teams focusing on their team dynamics from initiation (or creation of a team) to project completion. Data from mid-case and post-case interviews as well as observations, documents, and surveys formed the basis for their theory, which they generated through within-case and cross-case analysis. Their methodology is similar to the seminal work of Ely and Thomas (2001), who generated Grounded Theory on how cultural diversity impacts the team solution-creation process and team performance using interviews and meeting observations. Herein they focused on group processes and individual experiences around the impact of cultural diversity on group functioning. This thesis also draws from the work of Kourti et al. (2018) on identities in the context of inter-organisational collaboration, who employed a similar methodology.

Field-based research allows for in-depth insights into real-life events and organisations thus increasing so-called ecological validity (Aubé et al., 2018; Bryman, 2016). A multiple-case study

enables the researcher to compare multiple cases (here: three workgroups) to examine the research question under multiple conditions (Bryman, 2016; Yin, 2013). This allows the theory arising from the research process to be more broadly applicable than theories arising from a single case-study (Yin, 2013). The use of a Grounded Theory approach further emphasises these advantages by generating theory directly from the data rather than testing a theory from outside the research context (Glaser & Strauss, 1967).

### 3.2.1. Operationalisation of Key Concepts

The term organisational culture is a broad concept as described in Section 2.4.1. In the current section, its qualitative operationalisation is described to only include those factors most relevant in the setting of inter-organisational collaboration for sustainability challenges. Additionally, team diversity terminology has long struggled with operationalisation of types of diversity (see for a detailed discussion Harrison and Klein [2007]). This section will elaborate on the operationalisation chosen for this thesis. Similarly, the concept of team mental models has many analogous terms with vague definitions as many researchers have avoided clear conceptualisations and operationalisations of the term (Mohammed et al., 2010).[14] This section, therefore, elaborates on the operationalisation of these key concepts in the context of this thesis.

#### *3.2.1.1. Organisational Culture*

As elaborated upon in the previous chapter, organisational culture includes ideologies, values, and practices (Schneider et al., 2011). This thesis will focus on (and thus analyse) relevant cultural aspects of a home-organisation's culture given the context of inter-organisational collaboration for sustainability. These aspects include the home-organisation's view of sustainability and inter-organisational collaboration (especially in the investigated collaboration organisation). Due to participating members having to refer to their home-organisations for decision-making, processes and hierarchies of decision-making are also considered. This is also related to organisation size. Another relevant aspect is the industry or sector in which the home-organisation operates, including whether this is commercial on non-commercial. Work environment and the workstyle of employees are also considered.

#### *3.2.1.2. Home-Organisation Diversity*

Home-organisation (HO) diversity is a type of diversity based on individuals coming from different organisations, which is a categorical and thus qualitative basis on which individuals differ from each other (see Chapter 2). Blau's index is a widely used measure in team diversity research to assess the degree of diversity on a categorical basis (Bunderson & Van der Vegt, 2018; Harrison & Klein, 2007). The index is based on the maximum number of possible categories (here: home-organisations) that could be represented in a group compared to the number of categories that are actually represented (Harrison & Klein, 2007). The following formula is used to calculate Blau's index for categorical diversity, i.e. variety, in a given group:

$$1 - \sum p_k^2$$

Here p is the proportion of group members belonging to the kth category. This means that Blau's index can range from 0 to (k-1)/k, which is the point where group members are spread equally over all possible categories. This results in "evenness" and "richness" of diversity, respectively (Harrison & Klein, 2007). As k increases, i.e. the number of possible categories increases, the maximum of Blau's

[14] Although this thesis focuses on how home-organisation diversity influences the development of similar team mental models (TMMs) rather than their exact content, it is important to also establish what these TMMs contain to ensure an accurate understanding of how their development was influenced. Section 4.1.4. reiterates this point when introducing the results on the development of similar TMMs.

index increases toward the limit of 1. This means that the size of a group influences the maximum value of Blau's index as larger groups have more possible categories and thus higher potential values of variety (Harrison & Klein, 2007).

#### *3.2.1.3. Team Mental Models*

As mentioned in the previous chapter, the content of a team mental model (TMM) in the context of this thesis includes both taskwork and teamwork. As the emphasis of this thesis is on similar TMMs, the current operationalisation of TMMs includes the process of establishing what is similar among the TMMs of individual members of the group (Mohammed et al., 2010). It therefore considers similarity in understanding of the distinct workgroup goals among the workgroup members (taskwork) as well as a similar understanding of how the workgroup aims to achieve these goals, i.e. the solution-creation process (teamwork).

These similar TMMs for the three workgroups are investigated through an interpretative and observational approach and with the aid of semi-structured interviews and an elaborate research diary (see below). The data is analysed through a Grounded Theory approach and from the concepts the similarity of a particular understanding of workgroup goals, i.e. taskwork, and workgroup solution-creation processes, i.e. teamwork, is examined.[15] From this, the similarities in TMMs among members are combined to construct an overview of TMM similarities, i.e. the aspects of all the group members' TMMs that are similar to each other (Mohammed et al., 2010).

### 3.2.2. Data Collection

In line with Grounded Theory development, this thesis will use an iterative process of data collection and analysis employing within-case and cross-case analysis (Eisenhardt, 1989; Glaser & Strauss, 1967). Data on the various home-organisations is collected from workgroup members throughout the research period. This includes considerations around organisational culture and incentives but also indications of organisation size and the number of participating members. The home-organisations of all workgroup members are then used to quantitatively establish the degree of HO diversity in each workgroup using Blau's index as explained above (the only time quantification is employed in this thesis).

Qualitative data was collected through meeting observations, semi-structured interviews, and document analysis (see the work of Ely and Thomas [2001], Ericksen and Dyer [2004], and Kourti et al. [2018]). Data triangulation enhanced the validity of this study by allowing findings from one source to be compared with another (Bryman, 2016; Ericksen & Dyer, 2004). Organisation documents were collected and utilised for establishing an objective workgroup context and history (Ericksen & Dyer, 2004). Documentation allowed for insights into the development of workgroup goals and compositions over the four years of the existence of the workgroups. It furthermore gave insights into the decision-making process surrounding these workgroups and their goals during the research period (see also Ely and Thomas [2001]). During workgroup meetings, notes on activities and impressions were taken (Ely & Thomas, 2001; Ericksen & Dyer, 2004) and recorded in a research diary. Team meeting observations do not rely on self-reporting and can thus be considered more objective than interviews (Homan et al., 2007; Yin, 2013).

Semi-structured interviews allow interviewees to elaborate on their experiences and provide rich details and anecdotes exemplifying events relevant to the research topic (Bryman, 2016). They therefore enable longitudinal research more easily than direct observation (Bryman, 2016). These different data sources were used to construct a 'picture' of each of the three workgroups, their

[15] This examination includes questions such as: 'how much do workgroup members agree on the goal of the group' and 'how much do they agree on how decisions should be made?'

solution-creation processes and their members' TMMs. As the operating language of the collaboration organisation is Dutch, all field notes from meeting observations, transcripts of semi-structured interviews, and organisation documents are in Dutch. During analysis (see below) concepts and categories were constructed in English and quotes were translated with care to include underlying tone and meaning available in the Dutch language.

Interviewees were sampled through theoretical and snowball sampling. Firstly, individuals in leadership positions, i.e. workgroup chairpersons, the programme manager, and members of the board, were interviewed (theoretical sampling) as these individuals have an overview of the collaboration organisation and can thus provide context necessary to continue investigating in more depth (see also Ely and Thomas [2001]). Thereafter, they were asked to suggest workgroup members they deemed most relevant and informative for the conducted research (snowball sampling). Additionally, interviews were conducted with spokespeople of participating organisations to ensure insights were representative and to allow for as many HO perspectives as practically feasible to be considered (theoretical sampling). Employees of twelve different HOs were interviewed. The full overview of interviewees is depicted in Table 6.

*Table 6: Overview of Interviewees*

| **Code** | C1 | C2 | C3 | Chair | E | L1 | L2 |
|---|---|---|---|---|---|---|---|
| **Position in GBCU** | Chairperson Circularity | Workgroup member Circularity | Workgroup member Circularity | Chairperson Board | Programme Manager Liveliness | Chairperson Liveliness | Workgroup member Liveliness |
| | | | | | | | |
| **Code** | L3 | M1 | PM | S1 | S2 | S3 | |
| **Position in GBCU** | Workgroup member Liveliness | Chairperson Mobility | Programme Manager | Contact Person Citrine | Contact Person Amethyst | Contact Person Aquamarine | |
| | | | | | | | |
| **Code** | S4 | S5 | S6 | S7 | S8 | U | |
| **Position in GBCU** | Contact Person Alexandrite | Contact Person Peridot | Previous Contact Person Amethyst and Chairperson Liveliness | Contact Person Spinel | Contact Person Garnet | Workgroup member Mobility, New Treasurer Board | |

Interviews lasted between twenty minutes and an hour. This depended on the role of the interviewee in the collaboration organisation – with shorter interviews for spokespeople as opposed to active participants of workgroups – and the time they had spent in the collaboration organisation. Individuals with longer tenure tended to have longer interviews as they were able to provide more insights into the functioning of one or more workgroups or the whole organisation over time. For these reasons, interview guides differed slightly depending on the interviewee's position/role in the organisation.[16] For example, spokespeople were mainly given questions about their home-organisations while interviewees in leadership positions were asked about their specific roles and influence on the solution-creation processes of the three workgroups. The general interview guide can be found in Appendix A.

Interviews with workgroup members – whether chairpersons or ordinary members – focused on their perspectives on the goal and functioning of the workgroup, aiming to investigate their team

[16] Interview questions were predominantly based on the works of Ely and Thomas (2001) and Ericksen and Dyer (2004) and adapted to the context of home-organisation diversity using guidelines from Bryman (2016) to create methodologically sound formulations.

mental models. This allowed the researcher to deduce TMMs and the degree to which they were similar among workgroup members. Firstly, interviewees were asked about how and why they started participating in the collaboration organisation and their workgroup (see also Ericksen and Dyer [2004]). They were asked to elaborate on their role in their HO, including their function, expertise, and resources (see also Ericksen and Dyer [2004]). The main component of the interviews was focused on their perspectives on and experiences of the goal of their workgroup and the solution-creation process of their workgroup. Interviewees were asked to highlight specific events and projects to obtain concrete examples of the solution-creation process of the workgroup (see also Ely and Thomas [2001] and Ericksen and Dyer [2004]). Questions about HO diversity included how – if at all – interviewees experienced the effects of HO diversity in their workgroups and their views on it (see also Ely and Thomas [2001]).

These questions allowed for detailed examining of the mental models of workgroup members regarding taskwork and teamwork as well as their perceptions of organisational culture and HO diversity. It furthermore allowed the researcher to establish the context and dynamics of each workgroup and the meaning attributed to this context and workgroup dynamics (Ely & Thomas, 2001). This included how HO diversity – and members' perspectives on it – influenced the development of a similar understanding of workgroup goals and of how to achieve these goals, i.e. TMMs (Mohammed et al., 2010). Lastly, interviewees were always asked to suggest other individuals to be interviewed as mentioned above (snowball sampling).

This sampling combination (theoretical and snowball) ensured efficient use of research time available as well as a holistic picture of the factors (both diversity and otherwise) influencing the development of similar TMMs for the solution-creation process. Additionally, it allowed for achieving theoretical saturation in an efficient manner (see below). While interviews allowed for detailed understanding from an individual's perspective, meeting observations enabled an examination of the team solution-creation process and the mental models underlying it in real-time rather than through a reflective approach (Bryman, 2016; e.g. Ely & Thomas, 2001). This was strengthened by a discussion on research findings in one general participant meeting at the end of the research period allowing for feedback from research participants (Ely & Thomas, 2001; Miles & Huberman, 1984).

Each of these data sources has its own referencing. In the case of interviewees this is anonymised (see Table 6 for the overview). Documents are referenced 'YP[year]' for year plans and annual reflection reports are referenced 'AR[year]'. Meeting observations (O) are denoted by the relevant letter: C for Circularity meetings, M for Mobility meetings, L for Liveliness meetings, B for board meetings, and P for participant meetings. A full overview of all documents and meeting observations, including dates and attendees for the latter are shown in the tables below.[17]

*Table 7: Document Referencing Overview*

| Documents | Reference Code |
|---|---|
| Year Plan 2015 | YP2015 |
| Year Plan 2016 | YP2016 |
| Year Plan 2017 | YP2017 |
| Year Plan 2018 | YP2018 |
| Year Plan 2019 | YP2019 |
| Annual Reflection Report 2016 | AR2016 |
| Annual Reflection Report 2017 | AR2017 |

[17] Complete (anonymised) interview transcripts can be provided upon request and with approval of the interviewee.

*Table 8: Meeting Observation Referencing Overview*

| Meeting Observations | Reference Code | Date | Attendees |
|---|---|---|---|
| Board Meeting 1 | OB1 | 07/11/2018 | Chair, PM, U + 1 |
| Participant Meeting 1 | OP1 | 13/11/2018 | Chair, U, C1, C2, M1, L2, S2, S3, S4, S5, S8 + 3 |
| Liveliness Meeting 1 | OL1 | 17/12/2018 | L1, L2, E + 3 |
| Mobility Meeting 1 | OM1 | 18/12/2018 | M1, U + 4 |
| Circularity Meeting 1 | OC1 | 20/12/2018 | C1, C2, U, PM + ~10 |
| Participant Meeting 2 | OP2 | 18/01/2019 | Chair, PM, U, C2, S4, S8 + 9 |
| Liveliness Meeting 2 | OL2 | 21/01/2019 | L1, L2, L3, E + 3 |
| Mobility Meeting 2 | OM2 | 30/01/2019 | M1, U + 3 |
| Liveliness Meeting 3 | OL3 | 18/02/2019 | L1, L2, L3, E + 2 |
| Board Meeting 2 | OB2 | 20/02/2019 | Chair, PM, U |
| Circularity Meeting 2 | OC2 | 07/03/2019 | C1, C3 + 4 |
| Participant Meeting 3 | OP3 | 12/03/2019 | Chair, PM, U, E, C1, C3, S2, S7 + 7 |

### 3.2.3. Data Analysis

During qualitative data analysis, this thesis followed early recommendations by Miles and Huberman (1984) on the analysis of qualitative data, employing data reduction, data display, and conclusion-drawing and verification throughout the analysis. Data reduction includes focusing and abstracting findings from the data collection process and occurs continuously throughout the research process. Data display entails organising the data in a manner that allows for data analysis and conclusion-drawing, e.g. in the form of graphs, networks, and charts. The last component of these recommendations is conclusion-drawing and verification, which includes noting patterns and irregularities of those patterns to draw meaning from the data and verifying these conclusions on the basis of robustness, validity, and plausibility. These recommendations are suitable for employing a Grounded Theory approach as especially data reduction and conclusion-drawing and verification overlap with its coding process.

This thesis adhered to the methodology of Grounded Theory as first proposed by Glaser and Strauss (1967) and later adapted by Corbin and Strauss (1990). It uses a coding process of open coding, axial coding, and selective coding (i.e. data reduction) using NVivo v12 software (see also Ericksen and Dyer [2004]). Open coding is the process of the initial comparison of events, actions, and statements based on their similarities and differences. In this process these conceptually similar items are grouped together and labelled. This process results in a coding scheme, which includes the conceptualisations of discovered concepts and overarching categories (Corbin & Strauss, 1990; Kendall, 1999). These concepts are then the basis for further (theoretical) sampling. Open coding provides a guide for the researcher to immediately start generating theory directly from the data.[18]

The second step of coding is axial coding. In this process concepts are related to overarching categories and these relationships are tested against the collected data. Simultaneously, new concepts might still be discovered through continuous data collection for the generation of theory. Corbin and Strauss (1990) emphasise that the alternation of collecting and analysing data is necessary to limit gaps in the theory as "analysis [directs] what one focuses upon during interviews and observations" (p. 13). This results in a continuous process of theory revision as more data is collected and analysed to systematically consider the full diversity of observed phenomena. This increases the conceptual density of the theory under development (Corbin & Strauss, 1990).

Lastly, the step of selective coding includes the grouping of concepts and categories around the central phenomenon of a study: the development of similar TMMs as influenced by HO diversity

[18] On the notion of erroneous labelling Corbin and Strauss (1990) state: "A researcher may inadvertently place data in a category where they do not analytically belong, but by means of systematic comparisons, the errors will eventually be located, and the data and concepts arranged in appropriate classifications" (p. 13).

(Corbin & Strauss, 1990). This type of coding also ensures that categories requiring more conceptual depth to provide explanatory power are further developed. The final codebook can be found in Appendix B.[19] Simultaneously, with the aid of data display, the coding process will continuously increase the conceptual depth of observed themes - or categories - and relationships among these themes for all workgroups. The quantitative data on HO diversity is used to add to the depth of these themes and establish more complete relationships (Bryman, 2016).

This iterative process was continued to create detailed descriptions of each workgroup and their solution-creation process in the within-case analysis. Feedback from participants (see above) was asked to validate the findings of the within-case analysis (Ely & Thomas, 2001; Miles & Huberman, 1984). Workgroups were compared in a cross-case analysis by exploring similarities and differences between workgroups and examining the relationships among the themes obtained from the within-case data analysis (see also Ericksen and Dyer [2004]). These similarities and differences were highlighted using data visualisation in the form of radar charts which required concepts to be attributed a position on a scale from high to low (Miles & Huberman, 1984). It was thus necessary to use so-called "quasi-quantification" (Bryman, 2016) to more readily compare workgroups.[20] Data collection was ended when theoretical saturation of concepts and categories was reached (Bryman, 2016; Ericksen & Dyer, 2004; Glaser & Strauss, 1967). This resulted in a theoretical framework on how HO diversity influences the development of similar TMMs for the solution-creation process for sustainability problems. This thesis furthermore compared the framework with current literature to increase its level of theory building and therewith its internal and external validity (Bryman, 2016; Eisenhardt, 1989; see also Ericksen and Dyer [2004]).

### 3.2.4. Considerations of Validity and Reliability

This thesis employed a qualitative (Grounded Theory) approach as opposed to a quantitative approach, which is more common in team diversity and TMM research. This section elaborates on the research quality criteria of internal validity, external validity, reliability, and objectivity. The quality criterion that is most discussed for the research design of this thesis is that of external validity or generalisability (Bryman, 2016). By definition, case studies focus on only few cases complicating the assurance of generalisability of case-study findings (Bryman, 2016; Yin, 2013). In the current study, validity limitations of the case study design are reduced in two ways. Firstly, by using multiple data sources, namely observations, semi-structured interviews, and documents, insights could be compared and validated.[21] Data triangulation thus added to the internal validity of this study by examining whether conclusions held up across data sources (Ericksen & Dyer, 2004). Secondly, multiple cases were analysed to enhance the external validity of the employed research methodology further.

[19] Although coding was done 'in vivo' as much as possible (in line with Grounded Theory methodology), occasional 'in vitro' coding was used. One reason is considered with translation from Dutch to English. Direct translations did not always capture the exact (underlying) meaning of certain concepts. This was most notably the case for the concept of 'champions'. Using in vivo coding, this concept could have been termed 'pullers'. However, this term does not seem to cover the full meaning intended by interviewees. Additionally, during the coding process, concepts were often combined (Corbin & Strauss, 1990)and the new (overarching/combined) concepts were termed in vitro for conciseness (Bryman, 2016; Miles & Huberman, 1984).

[20] Quasi-quantification is the process of attributing quantitative values to qualitative findings for the purpose of data visualisation and (through data visualisation) simplified comparison between cases. The attribution of quantitative values to qualitative findings is based on the interpretation of the researcher and, as such, the exact value of these quantitative values should be considered an indication of relative strength or prevalence rather than absolute strength or prevalence (Bryman, 2016). It should be noted that the results of the study are solely based on the qualitative analysis and the quasi-quantification is only used for (visual) comparison between cases.

[21] In their chapter on interviewing for qualitative research, Bryman (2016) elaborately discussed the advantages of observation over interviewing and vice versa. Using both thus also makes up for methodological limitations of one data source by using the other.

By analysing multiple cases, namely three, and comparing their similarities and differences to generate theory on how HO diversity influences the development of similar TMMs. The multiple-case study design employed here increases theory building and thus transferability (i.e. external validity) as compared to a single-case study design (Bryman, 2016; Eisenhardt, 1989; Yin, 2013). Additionally, the examination of multiple cases allows for a deeper understanding of the mechanisms, i.e. causes, behind observed phenomena than even with detailed analysis of a single case as "the researcher will be in a position to examine the operation of generative causal mechanisms in contrasting or similar contexts" (Bryman, 2016, p. 68). Similarly, the Grounded Theory approach aims to achieve generalisability through the "process of abstraction that takes place over the entire course of the research" (Corbin & Strauss, 1990, p. 15). Having multiple cases and analysing them through the lens of Grounded Theory, therefore, increases the dependability of the research analysis.

The cases examined here are so-called 'exemplifying cases' (Bryman, 2016) as they exemplify the broader category of inter-organisational workgroups increasingly prevalent in the current work environment (see Introduction). Exemplifying cases provide the researcher with a 'typical' context of the phenomenon or phenomena under analysis (Bryman, 2016) allowing here for a deeper understanding of how TMMs are impacted in an inter-organisational context. The cases here considered are also longitudinal cases, i.e. cases that are studied over time. The studied workgroups were examined throughout the research period through interviews and observations; moreover, the interviews and documents allowed for the analysis of past events and processes through reflection of interviewees and recorded goals, progress, and performance of the workgroups over the past four years. As argued in Chapter 2, studying team processes, e.g. developments of TMMs and solution-creation processes, over time provides detailed insights into these processes that could otherwise not be obtained (see also Bryman [2016] and Yin [2013]). Therefore, the current research design enhances internal and external validity through the use of multiple cases and the choice of these cases.

The choice of cases also influences the ecological validity of the current research design. Ecological validity is concerned with the applicability of the research findings to real-life phenomena (Bryman, 2016). As this thesis examines workgroups in their natural environment, generating theory in a natural social setting through a Grounded Theory approach, it will grant insights for not only theory but also practice in the fields of team diversity and sustainable innovation on the link between the development of workgroups (and their members' mental models) and their solution-creation processes (see also Aubé et al. [2018]). The current study is therewith socially relevant and practical; in other words, its ecological validity is ensured (Bryman, 2016; Glaser & Strauss, 1967).

The level of reliability of a study concerns "the question of whether the results of a study are repeatable" (Bryman, 2016, p. 41) and in qualitative social research – as in this thesis – this quality indicator points to the importance of consistent conceptualisation of (key) concepts. The previous and current chapter contain elaborate descriptions of the concepts central to this thesis (organisational culture, HO diversity, and TMMs) to ensure reliability. The consideration for ample reliability in the present study also enhances the (closely related) replicability of the research process (Bryman, 2016). Although ensuring replicability in Grounded Theory research and qualitative research more generally is considered difficult (Corbin & Strauss, 1990), this thesis aimed to enhance this by providing a thorough account of how the phenomenon studied was analysed to a higher level of abstraction (Corbin & Strauss, 1990). This study thus enhanced its replicability through clear conceptualisation and operationalisation of key concepts as well as a detailed account of the processes of data collection and data analysis. This thorough account furthermore shows how this study aims to increase its inferential validity through a systematic Grounded Theory approach, which allows for causal inferences to be made more readily than exclusively quantitative (correlative) approaches (Bryman, 2016; Eisenhardt, 1989; Glaser & Strauss, 1967).

# 4. Results

As stated in the previous chapter, this chapter discusses the various results from the data analysis of the three workgroups. These results provide answers to the six sub-questions leading to the main research question: how does home-organisation (HO) diversity influence the development of team mental models (TMMs) for the solution-creation process in interorganisational workgroups of sustainability challenges? The sub-questions will be answered throughout this chapter. The effects of HO diversity on the development of similar TMMs are first discussed for each workgroup individually. Through the coding process and the use of data display, data reduction, and conclusion-drawing and verification described in the previous chapter, preliminary within-case models were constructed on the development of similar TMMs in the three workgroups. The within-case analyses are followed by a cross-case analysis in which the results from the individual workgroups were compared elaborating on similarities and differences between them and further refining concepts and categories. This analysis resulted in the theoretical framework bringing together the answers to all six sub-questions.

## 4.1. Within-Case Analyses

This section first provides detailed descriptions of (1) workgroup structures, which includes roles, functions, and expertise of workgroup members as well as workgroup goals, (2) workgroup solution-creation processes, and (3) relations to various (relevant) home-organisations for each of the three workgroups. Where relevant for the development of similar team mental models (TMMs) and the exploitation of an effective solution-creation process, each within-case analysis also highlights changes in these components.[22] Secondly, this section discusses the implications of these descriptions for the research question. It therefore elaborates on the models for the development of similar TMMs in each workgroup and the role of HO diversity in this process. Concepts, categories, and their relationships found through the analysis are highlighted.[23]

### 4.1.1. Liveliness

The workgroup Liveliness consisted of eight members as of January 2019. The table below provides an overview of the home-organisations of these members and their corresponding industries. Both the workgroup's diversity in home-organisations and industries is calculated with Blau's index following Harrison and Klein (2007). Blau's index for HO diversity is at its maximum for this workgroup, indicating maximum possible HO diversity for this workgroup. However, it is slightly lower for industry diversity. This might imply that perspectives might not be as diverse as Blau's index for HO diversity suggests.

*Table 9: Workgroup Liveliness Composition*

| Workgroup Liveliness | | |
|---|---|---|
| | Organisation | Industry/Sector |
| Member 1 | Onyx | Banking / Finance |
| Member 2 | Tanzanite | Project Management |
| Member 3 | Spinel | Banking / Finance |
| Member 4 | Morganite | Transport |
| Member 5 | Opal | Consulting |
| Member 6 | Peridot | Restaurant |
| Member 7 | Amethyst | Government |
| Member 8 | Rubellite | Event Organisation |
| Blau's Index | 0.875 | 0.844 |

[22] This provides answers to sub-questions 1 to 4 for each workgroup.
[23] This provides answers to sub-question 5 for each workgroup individually.

#### 4.1.1.1. Workgroup Structure

The workgroup Liveliness is focused on creating an environment in and around the Utrecht Central station that is lively and pleasant for employees of organisation in the area and visitors of the area (L1, YP2015, YP2016, YP2017, YP2018, YP2019, Chair). The chairperson of the group (L1) is mainly focused on keeping the group motivated and establishing general guidelines for the group based on the agreed upon year plan. They are often requested for input (whether informational or material) regarding Liveliness projects in the area even before their time at the GBCU because of their function in their HO (L1). Because of this, they deem themselves the most suitable person from their HO to be involved in this workgroup. Apart from the chairperson, there appears to be no differentiation between team members for their importance in the group. The two exceptions to this are differentiation on level of activity in the group and 'seniority', i.e. workgroup members range from having participated in the workgroup for a few years to becoming team members during the research period.

The functions of workgroup members range from facility managers to project managers. Few are involved with event management and the type of project management relevant for 'Liveliness' projects (S6, E). This lack of relevant expertise was acknowledged by the group approximately two years before the research period and the workgroup hired two external programme managers (including E) to help the group with the execution of their projects. However, over time – especially once the current chairperson took up their position in the workgroup – their role shifted to a different supportive role mainly secretarial in nature. One of the programme managers (E) is now mainly involved with more routine tasks including creating the year plan, taking minutes for the group meetings, coordinating internal group communication, and writing up small reports on the various projects. They are also responsible for updating the chairperson on all projects currently being undertaken by workgroup members. This shift resulted from a desire to reduce the workload of the group's chairperson as they - and the other group members - experience a lot of time pressure due to the workgroup being external to their primary job (L1).

Currently, the group does not seem to have any people functioning as 'pillars' or champions as expressed by one group member (L2) and the group is slightly fragmented. This might also be partly attributed to the independent projects members work on (see below). Up to the end of 2018, the workgroup has only completed relatively short-term projects, which are disjoint from one another. For example, two members were involved with the execution of the 'green construction fences' project (L2, S7) with little to no contribution by other workgroup members (see Figure 5). During the research period the group therefore discussed changing its structure to create a "core team" within the workgroup focused on larger projects with peripheral members focussing on short-term projects. The latter group members would then be working on these projects in a self-supporting manner (L1). This possibility for a change in the solution-creation process was suggested because there are currently no "big gestures" (L1), i.e. projects with a large impact regarding the workgroup's goal and a high visibility, being created by the workgroup.

*Figure 5: Green Construction Fences (YP2019)*

*"We think that the attention we currently give [to the workgroup], admittedly, ensures that you conduct small interventions, but that you get no further even though, I think, the area is really large. It should be fairly possible to do something that matters, and I can see that happening in a big gesture, but then we would need a few more people. Then you need to be able to spar with each other and back each other up and stimulate each other. That is what I have suggested." - L1*

L2 agreed with this notion and stated that they consider conducting one larger project as a group (using all the resources the group has available to it) would be beneficial for the project output and visibility of the workgroup.[24]

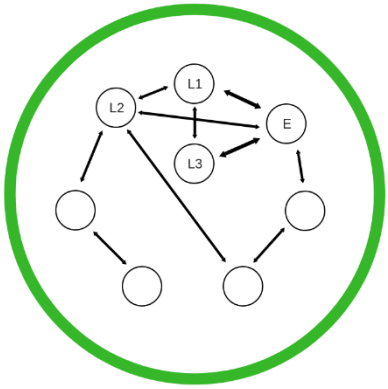


*Figure 6: Workgroup Structure Liveliness*

#### *4.1.1.2. Workgroup Solution-creation Process*

At the beginning of the research period, the workgroup would meet between every month and every two months to discuss project progress and more general workgroup processes and structure. Projects of the workgroup Liveliness are decided upon during the workgroup meetings, especially leading up to the creation of the year plan. However, all projects are led by one or two people who are responsible for executing the project. L1 described all past and current projects as having clear ends, i.e. there are no continuous projects, with a few potentially leading to follow-up projects. The solution-creation process of the workgroup Liveliness thus bases itself on pairs or small groups of members responsible for the execution of short-term (i.e. 'small') projects. Meetings are generally focussed on brainstorming for new project ideas and updates on ongoing projects from responsible members. This causes a lack of connection between the various small groups within the workgroup, making an overarching solution-creation process and TMM difficult to be developed.

For projects the workgroup contacts external parties to execute the project as they often require (technical/material) expertise that the workgroup does not possess (despite the high home-organisation diversity of the workgroup). The solution-creation process therefore heavily relies on parties external to the workgroup. An example of a completed project mentioned frequently is the 'compliments gate' (Figure 7). For this project the group hired an external party to design and construct the gate following the workgroup's sustainability guidelines (L1). However, the solution-creation process has not always lead to the successful execution of a project. The clearest example of

[24] However, during the evaluation period at the end of 2018 and the beginning of 2019, the workgroup did not revisit this proposed structural change of dividing the workgroup into larger and smaller projects. Instead the workgroup decided to keep its structure the same as in the previous year with only a division in name between "big" and "small" projects. However, according to E, this distinction is rather artificial as many small projects will still require a lot of time to execute and might actually result in members taking on too many tasks rather than focusing their time and other resources on one "big" project. Figure 6 shows a simplified version of the discussed workgroup structure of Liveliness.

this is the project of the green oasis (L1, L2, Chair). The workgroup started working on the green oasis project two years before the research period, but the project has of yet not been completed.[25]


*Figure 7: Compliments Gate (YP2019)*

To improve the solution-creation process, the workgroup reflected on their goals and projects. Most reflection took place towards the end of the year, continuing into the beginning of the subsequent year, when the year plan was being developed. This reflection process was observed in one meeting designated for this purpose in the middle of December (OL1). Here the group evaluated the previous year and developed ideas on work processes for the upcoming year. Afterward, the meeting shifted to its second main topic in the generation of ideas for new projects for the upcoming year. These included short-term ("small") as well as longer-term ("big") projects. The brainstorm was highly active with engagement from group members with long as well as short group tenure. In the brainstorm new ideas kept being raised and included ideas for projects prepared by (long group tenure) members before the meeting as well as ideas generated spontaneously during the meeting. While the first part of the meeting was highly structured, the second was relatively unstructured with only occasional steering from L1.

From analysing all data sources, many factors were found to influence the way in which the TMMs of the workgroup members developed. The factors most relevant to the workgroup's characteristics and solution-creation process were discussed in this section. Figure 8 summarises this section visually. Based on the analysis, scores between one and five were assigned by the researcher to the most relevant factors for TMM development (see Chapter 3 and Footnote 20 on the quasi-quantification of qualitative data for data visualisation). For example, a higher score on work environment indicates a higher professionality of the work environment. Figure 8 shows the high HO diversity and large size of the workgroup Liveliness; moreover, it shows how the workgroup struggled

[25] Two group members were in charge of executing it, L1 and L3. During the first year of the project, there was much discussion with the municipality on the location of the green oasis, a long process due to the complexity of working with the municipality (see below) and other external stakeholders, e.g. contractors (L1). The second year of the project L1 became chairperson of the workgroup shifting full responsibility for the green oasis project to L3. According to them, finding a location for the green oasis remains a problem resulting in others (Chair, L1, E, U [private]) stating the potential of replacing the idea for a (semi-)permanent green oasis with a transportable green oasis. However, L3 did not mention this idea.

with its solution-creation process and developing specific goals (showcased by the low scores in the figure) as discussed throughout this section.

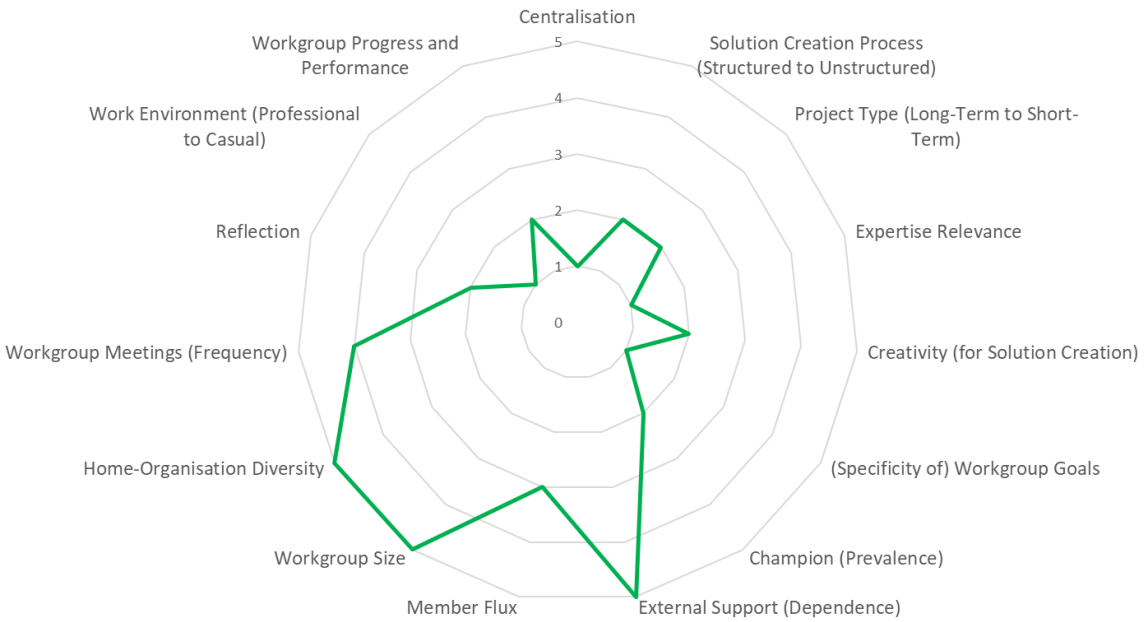


*Figure 8: Workgroup Characteristics and Workgroup Content Scores for Liveliness*

#### *4.1.1.3. Relations with Home-Organisations*

The workgroup Liveliness has little involvement with the internal processes of the various home-organisations participating in the GBCU and many GBCU members have expressed that this different goal type aids the solution-creation process of the group (L1, C1, M1, PM). The distinction from the other two workgroups was clearly articulated by the chairperson of another workgroup:

> *"I think the largest difference [between Mobility and other workgroups] is with Liveliness. That is… cheering up the neighbourhood - with all due respect. Everyone is in favour of that: you cannot be against that. […] no one's primary business model is damaged because of it." - M1*

In addition to Liveliness projects requiring external parties for their executions as mentioned above, most projects - if not all - require input and/or permission from the municipality (L1, L2). However, working with the municipality has been experienced as a slow process (L1, L3) despite municipality employees involved in the workgroup having been very motivated towards completing workgroup projects (L2, S6, S2). This is due to the high level of bureaucracy within this organisation, most importantly the difficulty finding the appropriate people within the organisation, i.e. the people responsible and in charge of certain aspects of municipal work. The frustration this elucidates was expressed in a metaphor by L1 as follows:

> *"I sometimes view [the municipality as an organisation] as some type of city with all these small streets and if you need something, it needs to come from one of those little streets and before you have been through all those streets and arrived at the right address… man, that really is a hassle and sometimes they [people working at the municipality] work against each other and do not inform each other." - L1*

This high level of bureaucracy negatively impacted the efficiency of the workgroup's solution-creation process (L1, Chair). The workgroup (and the GBCU in general) aimed to alleviate the complexity of municipality contact in 2019. For this purpose, the municipality set up an internal team to clarify the

internal structure of their organisation to their spokesperson and to directly connect workgroups with relevant municipality employees (Chair, S2).

### 4.1.2. Mobility

The workgroup Mobility consisted of four members as of 2019. The table below provides an overview of the home-organisations of these members and their corresponding industries. It moreover shows Blau's index as a measure of the workgroup's diversity regarding home-organisation (HO) and industry diversity. Blau's index for HO diversity is relatively low for this workgroup as two members work at the same HO and the workgroup only consists of four members. This is paired with the same low diversity in industry, indicating limited diversity in perspectives.

*Table 10: Workgroup Mobility Composition*

| Workgroup Mobility | | |
|---|---|---|
| | Organisation | Industry/Sector |
| Member 1 | Opal | Consulting |
| Member 2 | Opal | Consulting |
| Member 3 | Amethyst | Government |
| Member 4 | Turquoise | Real Estate |
| | | |
| Blau's Index | 0.625 | 0.625 |

#### *4.1.2.1. Workgroup Structure*

The workgroup Mobility is focused on making person-Mobility in the area more sustainable (YP2015, YP2016, YP2017, YP2018, YP2019). The last few years, the aim was to achieve this through the travel of employees of the various home-organisations. However, the chairperson of the GBCU suggested to extend this to visitor-Mobility (Chair). Similar to the other workgroups, Mobility has a chairperson who is in charge of chairing the group's meetings, ensuring that goals are met and projects completed, and motivating the group and its members (M1). The role of M1 in their HO also focuses on Mobility, giving them expertise regarding and a personal connection to the focus of the workgroup. Before M1 was chairperson of the workgroup, the group experienced a flux of members entering and leaving the group. This, according to M1, resulted in an ineffective solution-creation process (see below). They therefore emphasise continuity and expertise on the topic as key enablers of an effective process and have aimed to create this environment by establishing a core group of key members.

This core group consisted of three people: the chairperson, the key figure, and one other key player in the GBCU. The latter person is hired from an external organisation focusing on Mobility in the area (U). There are two paid workdays allocated for U to work on GBCU-related projects, which makes them fundamentally different from the volunteering members of the organisations participating in the GBCU (U, M1). Therefore, they do not experience time pressure in the same way and to the same extent as other members of the workgroup Mobility (and the other workgroups; M1, U, L1, OM1, OM2). The member base of the group is currently again shifting as one member, a key figure of the group possessing valuable knowledge and connections is leaving (M1, U, OM1) and a new member from the municipality has entered the group (OM1). This shift results in only two participating organisations of the GBCU being (actively) represented in the workgroup Mobility until one new member from a different HO joined the group at the beginning of 2019.[26]

[26] The workgroup still expressed a desire for additional members in the year plan draft (2019) and emphasised this in the participant meeting discussing this draft. This resulted into one new member entering the workgroup. The group remains, however, small compared to the other workgroups.

During the first half of 2019, U will transition from this role into their new role as part of the GBCU board. They will then have similar time constraints as other (board) members as this will be voluntary rather than paid work. U expressed some thoughts regarding the impact of paid versus voluntary contributions as follows:

> *"Yes, I'm trying to imagine if you didn't have someone [paid] like me [...]. That might be really difficult. I think that might actually be one of the reasons why it is going so well. [...] If that would cease to exist, then you would have to finance that together in some way. [...] I think that would be the 'next level', that there is a limit to what you can ask of the [participating] companies."*

U thus implies that the impact of the workgroups is limited (partly) due to the voluntary nature of collaboration participation as 'volunteers' can show less commitment, i.e. put in less time and effort. This in turn affects group dynamics and therewith the development of similar TMMs. The difference between paid and voluntary participation is immediately clear in the number of tasks U undertakes for the workgroup Mobility especially compared to other workgroup members, including its chairperson (see below).[27] Figure 9 shows a simplified version of this workgroup structure.

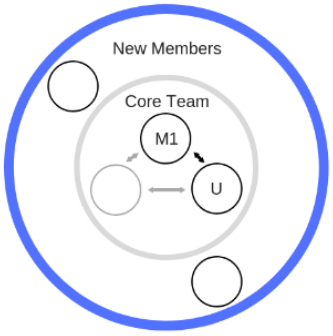


*Figure 9: Workgroup Structure Mobility*

#### 4.1.2.2. Workgroup Solution-creation Process

The Mobility workgroup meets every month to discuss the progress of their various projects and to divide new tasks. According to U, there is also much discussion on how to improve the workgroup:

> *"In the workgroup Mobility, we talk much more about content and we are constantly looking for 'how can this be improved'. […] There we also come together more often and are very active in thinking about this [improving the work process], I think. So, I think that's really good, but the workgroup is smaller so less strong."*

Regular meetings with explicit reflection on workgroup goals and the solution-creation process, result in an environment of learning within the group. This environment includes the solution-creation process as the group learns from the execution of past projects, whether (partly) failed or successful, to improve the process for current and future projects (M1).

[27] When they leave, they indicated it would be important they be succeeded. U indicated they were actively preparing a potential successor for the goods transport project. However, they also stated that ultimately this project manager would be hired in a manner similar to their own recruitment, which implies that despite the goods transport project keeping a project manager, they might not be the one 'groomed for the job' (U). In other words, a different, new project manager would need more time than U's proposed candidate to become familiar with the workgroup Mobility. If (or when) U is succeeded, the workgroup's structure would remain similar to the structure discussed in this section.

Ideas for projects arise during brainstorm sessions within the group and a small number of group members, i.e. two or three, are then made responsible for executing tasks related to the subgroup's projects (M1, OM1, OM2). According to M1, U always takes part in each of these subgroups, becoming a "linking pin" within the network of the group and causes the group to experience a feeling of continuity. M1's perception of U is shared by others (PM, C1) and shows U's central role in the workgroup. Additionally, this centralised working process ensures efficiency (M1). The solution-creation process of the workgroup Mobility is thus highly dependent on a few members of the workgroup (now only M1 and U). Especially U is actively involved with all tasks the workgroup completes to achieve a more sustainable Mobility policy in participating organisations as well as the central station area more generally.

As discussed previously for the workgroup Liveliness, many factors were found to influence the way in which the TMMs of the workgroup members developed. The most relevant factors for the development of TMMs of workgroup members (now for the workgroup Mobility) were discussed in this section. They were assigned scores by the researcher to visually summarise this section resulting in Figure 10 (see Chapter 3 and Footnote 20 on the quasi-quantification of qualitative data for data visualisation). Figure 10 shows how the workgroup Mobility was the exact opposite of the workgroup Liveliness in many aspects. The small workgroup had little diversity and experienced fewer challenges with developing a structured solution-creation process or specific workgroup goals. Champion prevalence and expertise relevance were also significantly higher than for the workgroup Liveliness.


*Figure 10: Workgroup Characteristics and Workgroup Content Scores for Mobility*

#### 4.1.2.3. Relations with Home-Organisations

The lack of participant involvement mentioned above is tightly connected to the focus of the workgroup, which "really touches business management [...] how to move people, [...] it is your whole policy, your terms of employment" (U). In other words, Mobility projects appear to affect the core business of many participating organisations, for example, in the terms of employment. The terms of employment of the various companies are viewed as a key barrier to successfully creating solutions in this workgroup (M1, U). This is also impacted by the different interests, working speeds, motivations, and sizes of the organisations (U). This was also observed by the other two workgroups as making the solution-creation process challenging (C1, L2). The workgroup Mobility has therefore decided to focus more on enabling more sustainable ways of travel rather than trying to stimulate a change in

behaviour from inside the organisations, changing its focus to avoid getting into conflict with the incentives of various participant organisations (OM1).

As stated above and expressed in the quote above from U, the shifting (and shrinking) member base of the workgroup has led to a lack of continuity (M1) and a limited number of participant organisations being represented in the workgroup (OM1, OM2). Multiple members of the group have, however, stated that a diversity in perspectives and experience would be valuable to the group's solution-creation process (M1, U, OM1). M1 expressed this as follows:

> *"Also, because we would like a broader representation [...] because it would create more support for our plans and also to perhaps get new ideas. From an advisory bureau you get a few ideas, from Amethyst and Moonstone[28], but then you only have part of the spectrum. You of course try to empathise with a bank or another party [...], but that is always difficult when you are not in that organisation."*

The spectrum referred to here is the full range of perspectives that can be obtained from the participating organisations. M1 thus indicates that the workgroup is missing insights from other parts of the 'spectrum', i.e. other organisations, that are not represented within the group. This corresponds to the low Blau's index calculated above. With its new focus (see above), the workgroup Mobility now aims to incorporate expertise and experience from different home-organisations to further their goals (OM1, M1). This includes a consideration of disadvantages of HO diversity experienced in the workgroup: culture and – especially – incentives.

The workgroup Mobility has experienced many challenges regarding the participation of organisations in one-time actions as well as longer-term projects (M1, U). According to multiple group members, this is because of the different interests of the various organisations (M1, U, OM1, OM2). M1 elaborated on how these incentives might complicate proposed changes for sustainability with regards to person-Mobility. These include the business models of various large organisations within the area which include income from parking garages and parking lots, thus creating barriers for employing measures for less car traffic to the area (M1, S8).

> *"We have six parking garages […] so when it comes to limiting Mobility, well, then I have a different viewpoint [than other participants]" – S8*

Conversely, the active involvement from Moonstone ensured the workgroup generally focused on public transport rather than other types of transport in the past (M1, OM1). The incentives of home-organisations thus play an important role in this workgroup.

### 4.1.3. Circularity

The workgroup Circularity consisted of eight members as of 2019. The table below provides an overview of their home-organisations and corresponding industries. It moreover shows Blau's index as a measure of the workgroup's diversity regarding home-organisation (HO) and industry diversity. Blau's index for HO diversity is near its maximum for this workgroup, indicating a high degree of HO diversity for this workgroup. However, Blau's index for industry diversity is significantly lower as many members come from similar industries or sectors. This might limit diversity in perspectives despite high HO diversity.

[28] These are two participating organisations in the collaboration organisation. Table 2 gives a full overview of the organisations participating in the Green Business Club Utrecht Centraal.

*Table 11: Workgroup Circularity Composition*

| Workgroup Circularity | | |
|---|---|---|
| | Organisation | Industry/Sector |
| Member 1 | Jade | Consulting |
| Member 2 | Opal | Consulting |
| Member 3 | Morganite | Transport |
| Member 4 | Spinel | Banking / Finance |
| Member 5 | Spinel | Banking / Finance |
| Member 6 | Amethyst | Government |
| Member 7 | Amethyst | Government |
| Member 8 | Onyx | Banking / Finance |
| | | |
| Blau's Index | 0.813 | 0.719 |

#### *4.1.3.1. Workgroup Structure*

The workgroup Circularity concerns itself with improving the Circularity of the area in two ways: waste/recycling and goods transport (YP2015, YP2016, YP2017, YP2018, YP2019).[29] The latter is a relatively new addition to the workgroup as this project started at the workgroup Mobility (see below; YP2018, YP2019). The workgroup Circularity has a chairperson in charge of chairing meetings and coordinating projects (C1). They occupy two roles within their own organisation, both relevant for the Circularity of the organisation. Additionally, they have an extensive network with other organisations across the country fulfilling roles similar to one of their roles (C1, C2, U). This allows for knowledge sharing both internally and externally for the GBCU and was part of the reason goods transport was shifted to the Circularity workgroup (C1, U, M1).

Two other members of the group are considered core members, C2 and C3. Together with the chairperson of the group they are the driving force for the two Circularity projects while other group members and participants generally contribute to the projects from the perspective of their home-organisations (PM, C1, C2, U). One more person is perceived as central to the group for the project of goods transport who, additionally, is a core member in the workgroup Mobility (U). Other members of the workgroup have less influence on workgroup decision-making and reflection and thus on the setting of goals (C1, C2, C3, OC1). These members can be considered 'peripheral members'.[30] Figure 11 shows a simplified version of the discussed workgroup structure of Circularity.

[29] As of 2019, the workgroup Circularity was officially divided into two new workgroups ('zero waste' and 'zero emission goods transport') to accommodate the two topics more effectively. Two members of the core team remained active in both workgroups. C3 became involved with only 'zero waste', while another individual from their HO entered the 'zero emission goods transport' workgroup. Although the workgroup was divided into two separate groups, C1 remained the workgroup chairperson for both workgroups (YP2019, OC2). Although new members joined the workgroups, both workgroups retained a core team – periphery structure similar to the initial workgroup wherein the core team relied heavily on C1 and C2 (with the addition of C3 in 'zero waste'). At the end of the research period, other members have started to show a willingness to increase their involvement in the workgroup 'zero waste' and become a part of the core team (OC2). C1 and C3 stated that this would be beneficial for the workgroup as it would ensure more involvement and commitment as well as less pressure on the previous core team members (OC2). As the two workgroups appear to function similarly and most research has been conducted during the period of a united Circularity workgroup, the remainder of this section takes a united perspective.

[30] This term was used to concisely state the role of members less actively involved in the workgroup than others, i.e. less than champions.

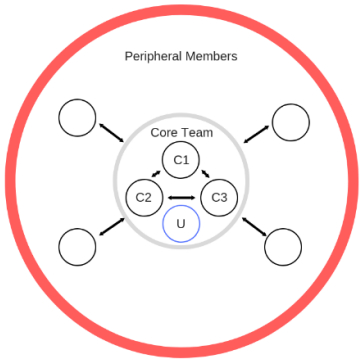


*Figure 11: Workgroup Structure Circularity*

#### *4.1.3.2. Workgroup Solution-creation Process*

As stated above, there are two areas of focus in the workgroup: waste/recycling and goods transport.[31] Both are large, long-term projects concerned with improving the Circularity of all participating organisations. The workgroup meets every six weeks to discuss both projects (C1). The workgroup agrees that the size and complexity of these projects warrants the creation of two distinct groups to improve the solution-creation process (U, C1, C2, C3, OC1, OC2). At the beginning of the research period, the core group members would 'pull' the two projects (C1, C2). They established and executed required tasks to meet the goals of the workgroup: zero emissions for goods transport and a fully circular waste system within the participating organisations.

Other workgroup members would remain involved, but decisions were made by the core members. This approach was aimed at improving the efficiency of the solution-creation process:

> *"If you want to make a decision with twenty people, then there never will be any decision made. So, then we said, 'you know, we just do it with the three of us, we decide and if other people are against it, then we will hear that, but then there has at least been made a decision.' So, that is only to keep pace, because otherwise it [the group process] doesn't make headway at all." – C1*

However, later this shifted slightly to a decision-making process wherein members present at meetings would decide (OC2). Ordinary meetings of the workgroup were small and therefore efficiency was retained. After decision-making in the workgroup, participating organisations then needed to communicate these decisions within their home-organisations. However, this could cause problems through the hierarchy (or horizontal divisions) of decision-making as group members do not always have the authority to execute workgroup decisions within their own organisations (C1).

The problem of decision-making is avoided in C1's organisation as they are in charge of both areas Circularity is concerned with.

[31] The goods transport component of the workgroup is a relatively new addition to the group as it was initially a project under U's responsibility at the Mobility workgroup. However, multiple interviewees stated having acknowledged that the people with influence on goods transport within the participating organisations were predominantly based in the Circularity workgroup (Chair, U, C1, M1, PM). To increase the efficiency - including regarding decision-making on the project within participating organisations - the project was shifted to this workgroup. However, all core members admit that the broadened focus of the workgroup (now including 'zero waste' and 'zero emission goods transport') raised the workload, further increasing the already high demand on the group's resources (C1, C2, C3, U). This resulted in the workgroup splitting into two workgroups at the beginning of 2019 as stated above.

*"That has to do with that I fulfil those special roles here, so I can quickly say 'now we are going to do it and not any other way' and someone else first has to have 86 hours of discussion and convince three managers. I don't have to do all of that." – C1*

However, this is a unique combination of functions highlighted by many as aiding the solution-creation process of the workgroup (U, C1, C2, Chair, PM). Both the sharing of data and knowledge more generally is easier for C1 than other members because of these differences. Both C2 and C3 ensure their ability to share knowledge through holding close connections with the others within their HO with decision-making authority. This process simultaneously affects how connected their home-organisations are to the collaboration organisation (C2, C3).

The solution-creation process of the workgroup Mobility is thus largely based on sharing knowledge among members of the group to ensure participating organisations individually work toward more circular waste and goods transport systems. Additionally, the core team carries out tasks related to overarching projects, e.g. the creation of a transport hub (OC1), with limited support from 'peripheral members'. The workgroup does not appear to work with pairs responsible for executing tasks (as is the case with the workgroup Liveliness). Rather the same core team members are constantly responsible for ensuring progress regarding workgroup goals. An example is how C1 and C2 created a 'recycling walk' in which employees of participant organisations could gather waste in the area during their breaks and could compete with each other for the largest amount of waste without input from other workgroup members (C1, C2, PM, Chair).

As for the other workgroups, many factors were found to influence the way in which the TMMs of workgroup members developed, which were discussed in this section. Figure 12 is a visual summary of these results. The most relevant factors for the development of TMMs of workgroup members were (as done previously for the other workgroups) assigned scores by the researcher (see Chapter 3 and Footnote 20 on the quasi-quantification of qualitative data for data visualisation). The workgroup Circularity is a mix of the other workgroups with high centralisation and goal specificity as well as high diversity in its large workgroup. It therefore has characteristics observed in both other workgroups.


*Figure 12: Workgroup Characteristics and Workgroup Content Scores for Circularity*

#### *4.1.3.3. Relations with Home-Organisations*

As mentioned above, the workgroup Circularity is concerned with improving the waste/recycling and goods transport systems for all participating organisations. For this purpose, they require a lot of data from the organisations which is acquired through the participating members in the workgroup (OC1).

These members are thus the contact persons for all organisations, the spokes in the network, while the core group members comprise the network hub (Figure 13).

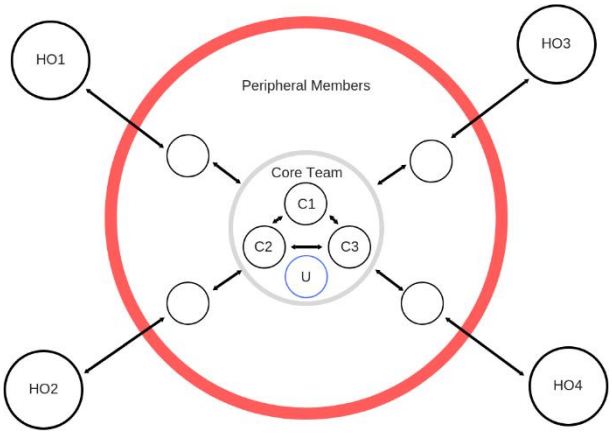


*Figure 13: Network Structure of Workgroup Circularity with Home-Organisations*

This is also reflected in the solution-creation process discussed in the previous section. According to C1, this network allows the participating organisations to learn from each other as 'best practices' are shared in a transparent manner, for example with contracts (e.g. for waste management) being made public between the participating organisations of the GBCU. The sharing of sustainability knowledge is relevant for the whole GBCU (C1) and is often emphasised by others (e.g. Chair) and elsewhere (reports). Expertise specific knowledge is also shared within the GBCU, according to C1, allowing the workgroups (including Circularity) to benefit from the diversity present in the network.

However, the workgroup experiences the occasional lack of commitment from the participating organisations in executing tasks:

> *"That [active commitment] doesn't happen right now, because then they suddenly cannot install the process in their organisation and then there is something else again and every time there is something in the way. I think in those moments: 'you know, if you say yes to something, then you also have to do it'." – C1*

This lack of commitment might be caused by the fact that decisions in meetings (both general participant meetings of the GBCU and workgroup meetings) are not always made by people in charge of those decision areas (C1). During one of the group's meetings (OC1), C1 aimed to prevent this from happening with (the next steps of) the goods transport project by strongly emphasising that the attendees had committed to actions toward a sustainable goods transport system in the meeting. They continued this approach by establishing deadlines for these actions experienced by others as 'stretch goals', goals that are set too ambitiously to be reasonably achieved (OC1). According to both C2 and C3, it is important that not only individuals are involved with the collaboration organisation (the GBCU) and the workgroup specifically but that participating organisations as a whole are actively participating, e.g. by sharing data and knowledge.

### 4.1.4. Development of Team Mental Models

As described above in Sections 4.1.1, 4.1.2., and 4.1.3, the three workgroups of the Green Business Club Utrecht Centraal (GBCU) have distinct workgroup goals, group compositions, and solution-creation processes. For these reasons, three separate models explicating the development of similar team mental models (TMMs) in the workgroups arose from the Grounded Theory data analysis. This section highlights the discovered concepts and categories influencing the development of similar

TMMs in each workgroup. Simultaneously, reasons for the degree to which TMMs appear to be similar among members are elaborated upon.[32]

#### *4.1.4.1. Liveliness*

Compared to the other workgroups, the workgroup Liveliness appears to have significant challenges with developing similar TMMs. The workgroup has few – if any – champions and therefore no core team that might facilitate the development of similar TMMs. Champions have high levels of motivation based on intrinsic factors and HO function. However, work within the workgroup Liveliness is generally not related to workgroup members' function in their HO and thus limits this type of motivation. As other workgroups have champions motivated based on their functions, this indicates that function-based motivation is key to the rise of workgroup champions. Examples are C1, C2, and C3 as well as M1 and U from the workgroups Circularity and Mobility, respectively.

Another side effect of limited functional relevance of the work is that the workgroup depends on external support for the execution of (most of) its projects. This restricts motivation for becoming actively involved in the workgroup and might account for low turnout for workgroup meetings before 2019. Most projects are short-term and disconnected, resulting in limited interaction between workgroup members outside of workgroup meetings. Moreover, although group members are still highly intrinsically motivated for the goal of the workgroup to create a livelier central station, the non-specific nature of this goal of the workgroup makes it difficult to create a sense of progress and impact. This results in the group appearing more like a loose connection of projects rather than one unit aiming to achieve one goal as is the case for the other two workgroups, complicating developing similar TMMs as member interaction is limited.

The workgroup has aimed to overcome this limitation to their solution-creation process by relying on external support to connect the various projects into one workgroup. However, this external project manager did not appear to be able to overcome the barrier for TMM development from having loosely connected projects. The workgroup experiences a lack of similar understanding of how to work toward the goal of the workgroup but especially of what the workgroup's goal actually is. This is reflected in the discussions around 'what Liveliness is', which have continuously been held in workgroup meetings for the last few years. Therefore, the key challenge of this workgroup appears to be coming to an agreement on a joint definition of the term 'Liveliness', as the concept is currently very vague.

Even when the year plan was agreed upon and projects were being explored, discussions of this nature still occurred showcasing how the workgroup seems to struggle with agreeing on the goal of the workgroup and what this entails for the projects they execute. Moreover, the phrasing around projects and the workgroup's goal itself (e.g. in the year plan of 2019) shows how ambiguous the essence, i.e. the ultimate goal or group identity, of the workgroup is. This ambiguity complicates agreement on goals and methods of how to achieve these goals. The workgroup seems to have settled for conducting smaller projects throughout the year in pairs or small groups. This impacts their solution-creation process by only loosely connecting members responsible for different projects rather than establishing an overarching solution-creation process to work towards an ultimate goal of the workgroup as a group. The lack of a concrete goal to work towards limits the ability of workgroup

[32] This thesis focuses on dynamic workgroup processes to address the gap in previous research into team diversity and team mental models, which have mainly included studies using quantitative, i.e. static, methods. However, the content of the various team mental models (TMMs) within the workgroups remains important to understanding how their development was influenced by home-organisation diversity. Therefore, Appendices C, D, and E showcase the taskwork- and teamwork-related components of these TMMs for the three workgroups by highlighting in which way these TMMs are similar among workgroup members.

members to develop a complete TMM as a key taskwork component is not clearly defined. In turn, this ensures a continuous heterogeneity in TMMs in the workgroup.

The workgroup Liveliness has the highest level of HO diversity. With this high diversity, it aims to stimulate creativity for high project idea generation. Although this ensures the idea output of this workgroup is high (and innovative), the high level of HO diversity is all but neglected in the execution of projects. HO diversity mainly influences the brainstorm sessions and too a much smaller degree general group discussions, including the discussions on the essence of the workgroup. Workgroup members only (indirectly) refer to their HO when generating project ideas and executing project ideas. Home-organisations do not appear to influence the deeper-level discussions of the workgroup in any noticeable manner. This indicates that the agreement on what the goals of the workgroup are (and the way in which these are to be achieved) is influenced by home-organisations and thus by HO diversity to a lesser extent than in the other workgroups.

Combining all insights from the within-case analysis, the development of similar TMMs for the workgroup Liveliness is limited. This is mainly the result of the unspecific goals of the workgroup due to the ambiguous nature of the term 'Liveliness' and is amplified by the nature of the workgroup itself. The lack of function-based motivation – as expertise, function, and sector (or field) of the HO are generally deemed irrelevant to the projects of the workgroup – contributes to this. Similar to the other workgroups (see below), workgroup processes are influenced by participant involvement and decision-making within participating organisations. All relationships among these concepts are displayed in the model below (Figure 14).[33]

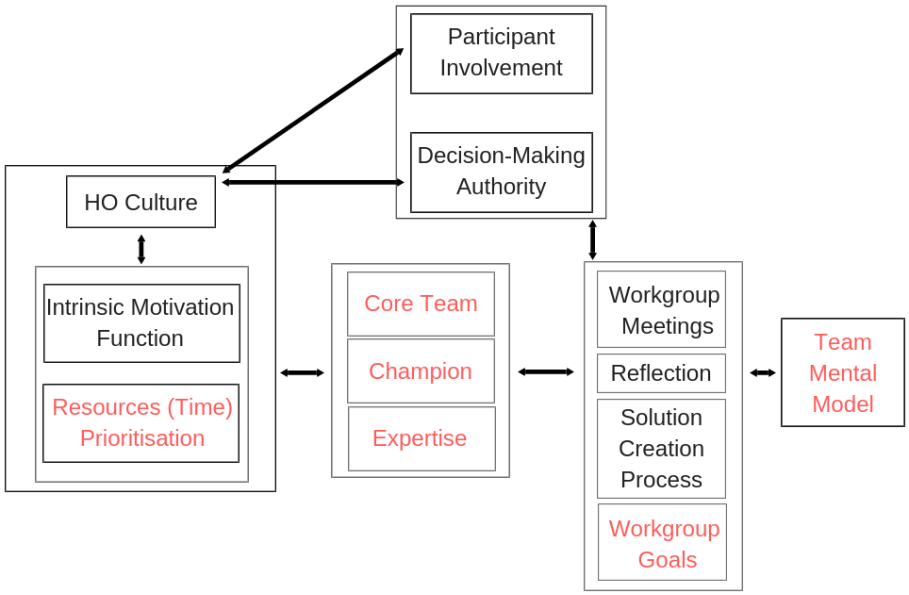


*Figure 14: Model on Team Mental Model Development for Workgroup Liveliness*

#### 4.1.4.2. Mobility

The workgroup Mobility has a limited number of members and therefore only needs a few individuals to agree upon workgroup goals and the way in which to achieve these goals. The past two years the group consisted of four members. Of these four members, three were considered active participants, part of a core team, by people inside the workgroup as well as outside the workgroup. Two came from the same HO and even the same department within their HO. The third core member came from a different HO and recently left the workgroup. This resulted in this workgroup having an extremely low

[33] Through the analysis it became clear that these relationships tend to work in both directions hence the bidirectional arrows in this model and the subsequent two models as well as the framework in Section 4.2.3.

HO diversity. The two members from the same HO remained active in the workgroup while other members left, and new members entered the workgroup. Workgroup meetings were often small – regularly limited to only these two or three members with another workgroup member joining occasionally – and the development of similar TMMs was thus largely restricted to these two or three members. Additionally, two came from the same home-organisation and thus shared the same organisational culture and incentives, aiding the development of an agreement on workgroup goals and its solution-creation process.

Similar to the workgroup Circularity, the most active members of this workgroup also had relevant expertise regarding the topic of the workgroup as their functions in their HO are concerned with (sustainable) Mobility problems. This enhanced the level of motivation for working in the collaboration organisation in general and this workgroup in particular. Expertise of the third core member originated in their HO, a large public transportation company, rather than in their specific function. However, this also resulted in the workgroup focusing on public transport for an extended amount of time rather than the current focus on other types of sustainable Mobility, e.g. electric cars.

One of the remaining core members of the workgroup is hired by a collaborator of the Green Business Club Utrecht to assist the GBCU in Mobility projects. This allows them to dedicate more time to the workgroup resulting in more influence in the workgroup as they execute more tasks and contribute more to the content of the workgroup. This has resulted in the workgroup chairperson, the other core member, to be less involved in doing work for the workgroup. However, the chairperson remains proactively involved in workgroup meetings in which they regularly need to 'slow them down' – as the paid support tends to take on (new) tasks immediately – to ensure that other workgroup members remain involved and realistic goals are set. Because of this, the large influence of the paid member has not prevented the development of similar TMMs and might have actually promoted it.

As mentioned above, the workgroup has struggled with generating commitment among participating organisations the goals of their workgroup due to different home-organisational cultures and incentives. This has resulted in the workgroup 'reinventing' itself from 2018 to 2019. This is a notable shift in its members' TMMs as the main approach of the workgroup changed. However, workgroup members were able to do this smoothly and retain a similar understanding of their goal and way of achieving this goal despite the large change through extensive reflection during meetings. Reflection is a recurring process the workgroup undertakes throughout the year to ensure agreement on what the workgroup is working on and why as well as improvement of their solution-creation process, thus solidifying similarity in TMMs continuously. Combined with low HO diversity and high motivation, this ensured similar TMMs for the workgroup.

The within-case analysis for the development of similar TMMs for the workgroup Mobility results in many similarities with the process for Circularity (see Section 4.1.4.3.). The main differences are related to the fields of home-organisations, which are more relevant in the case of Mobility, and the small workgroup size and high member flux of this workgroup. Workgroup processes are affected by the changing composition of the workgroup. This influences the development of similar TMMs in a negative manner. However, this is offset by the small size of the workgroup that is furthermore highly similar in terms of background and especially home-organisations. The relationships among these concepts are displayed in the model below (Figure 15).

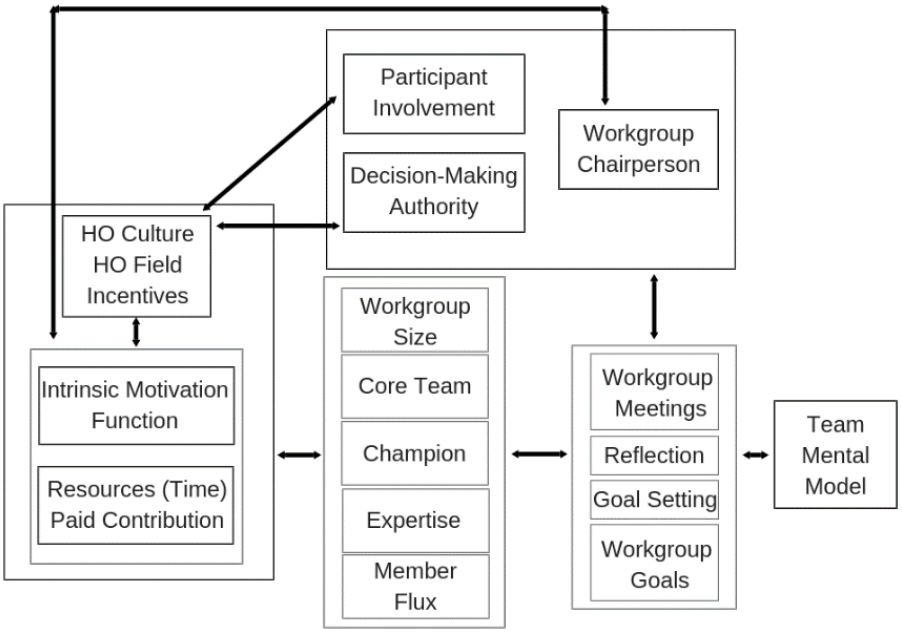


*Figure 15: Model on Team Mental Model Development for Workgroup Mobility*

#### 4.1.4.3. Circularity

To develop a similar understanding of workgroup goals and the way in which these goals will be achieved, the workgroup Circularity relies heavily on the similarity in functions of their members. The workgroup furthermore has mostly developed similar TMMs in a core team consistent of three champions. As noted before (Section 4.1.3.), this core team is a small group of workgroup members that are highly motivated and have expertise relevant for the workgroup. Additionally, two out of three members of the core team emphasised their place connection to the area and the city more generally. Due to their high motivation, these core team members therefore do not experience the time pressure associated with voluntary participation the same way as others as motivation enables individuals to justify the time spent on work for the workgroup. Prioritisation of work for the workgroup is therefore easier.

The workgroup now only contains individuals with functions relevant to the focus of the workgroup. This ensures that all members have expertise and connections that aid the solution-creation process directly. Moreover, shared expertise and function – even function title – resulted in a feeling of shared experience and background (C3). The differences among members as a result of HO diversity, e.g. in organisational cultures, might be (partly) negated by this shared experience. In other words, the initial mental models of new members might already be largely similar to those of the core team. This was hinted at by all three members of the core team and the development of similar TMMs, i.e. a similar understanding of the workgroup's goals and ways to achieve these goals, was relatively easy for this core team. This core team reflects often, both in person and over email, and enhances the similarity of their TMMs further by sharing knowledge extensively.

'Peripheral members' (as opposed to the core team) are less involved in the workgroup Circularity. For example, they express less commitment towards executing their tasks for a project and participate less (actively) in workgroup meetings. This might be caused by a different amount of time these members feel they can allocate to collaboration work, due to different prioritisation. Such prioritisation is grounded in (a) motivation and (b) the nature of the HO. Champions display a high level of intrinsic motivation in addition to their motivation arising from their function in their HO, while 'peripheral members' mainly rely on the latter type of motivation. Secondly, differences in workgroup members might be further enhanced by the HO. The culture of a HO, including its view on sustainability, influences how active its employees are in the workgroup Circularity.

Combining all insights from the within-case analysis, the development of similar TMMs for the workgroup Circularity is influenced by various components of the workgroup, including its goals and reflection on these goals. These in turn are influenced by the workgroup itself, which concerns both group-level (e.g. a core team) and individual-level factors (e.g. expertise). As argued extensively above, these are influenced by intrinsic and function-based motivation, the culture of the HO, and the time workgroup members make available for the workgroup. These factors are also relevant for the chairperson of the workgroup in their leadership position and the level of participant involvement. Moreover, the workgroup is closely connected to issues of decision-making in participating organisations because of their focus on more circular waste and goods transport management within these organisations. All relationships among these concepts are displayed in the model below (Figure 16).

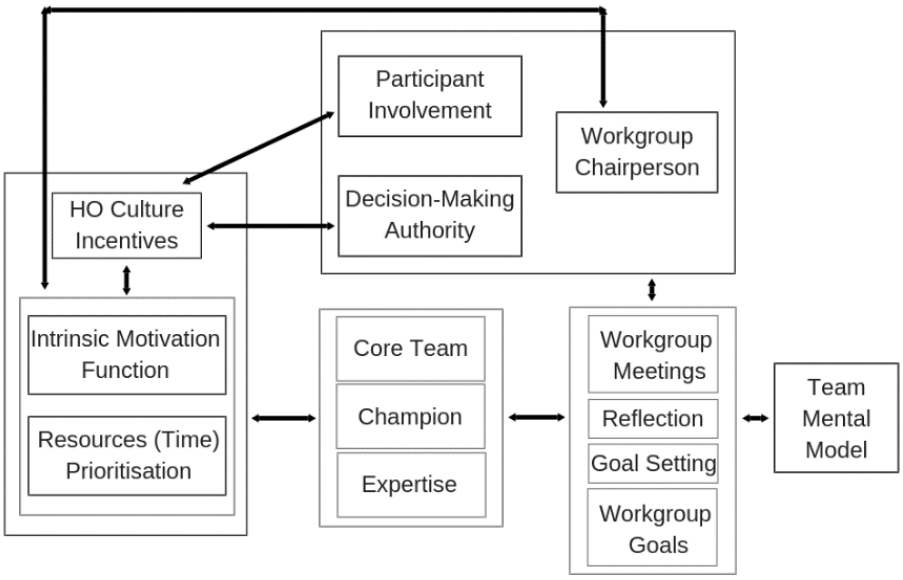


*Figure 16: Model on Team Mental Model Development for Workgroup Circularity*

## 4.2. Cross-Case Analysis

In the previous section, each workgroup-specific model on the development of similar team mental models (TMMs) for the solution-creation process was elaborated upon. However, to establish a holistic understanding of how similar TMMs are developed in workgroups more generally, this section compares these three models. Similarities and differences are highlighted while simultaneously concepts and categories previously discussed in the within-case analysis are revisited to enhance their depth even further. This results in the framework of the development of similar TMMs for the solution-creation process elaborated upon at the end of this section. This includes an analysis of the role of home-organisation (HO) diversity in this process.[34]

### 4.2.1. Similarities

Although these workgroup-specific frameworks of TMM development are distinct, similarities can still be identified. All three workgroups rely on workgroup discussions lead by the workgroup's chairperson to reflect on the goals of the workgroup and processes through which the workgroup conducts their (project) work. Additionally, members of all workgroups indicated that the role of motivation is vital to workgroup functioning by driving a coherent workgroup toward solution-creation through member commitment of time, expertise, and network connections as well as their commitment to an (ambitious) common goal. This directly shows the relevance of motivation for the development of

[34] This provides an integrated answer to sub-question 5 and a holistic answer to sub-question 6.

similar TMMs in all three workgroups as central workgroup discussion allows for establishing a team goal and a method of achieving said goal, i.e. the main components of a TMM (Cooke et al., 2000), as well as generating similarities in members' TMMs at the same time.

Motivation did not only prove to be considered vital for commitment of team members in general, but especially for the rise of workgroup 'champions'. Champions are highly motivated group members with expertise in relevant fields as well as connections relevant for the workgroup in and/or outside of their HO. As champions are highly motivated, they consider the constraint put on their time to be less prevalent than others. One example is the chairperson of the workgroup Circularity (C1). As elaborated upon in Section 4.1.3., they are highly motivated and have expertise as well as connections relevant for the workgroup, which is related to their role within their HO. Furthermore, champion-like behaviour could also be observed outside of the workgroups in the GBCU board and the programme manager. The individuals in these organisational leadership roles all highlighted personal motivation as a main driver for their commitment to the organisation.

Closely connected to workgroup champions is the role of external support. 'External support' constitutes both individuals and organisations hired (or collaborated with) to improve the efficiency and effectiveness of the solution-creation process. Two workgroups have (semi-)permanent external support in the form of project managers. The project manager in the workgroup Mobility, U, is hired through another organisation with which the GBCU collaborates to reduce $CO_2$ emissions from Mobility. The workgroup Liveliness hired external support themselves, contracting a project manager, E (as well as a colleague of theirs), to aid them in the solution-creation process. The roles of these project managers have been more explicitly described in Sections 4.1.1. and 4.1.2. However, external support can also result in other group members feeling less need to commit (M1, U, E). This lack of commitment affects the development of similar TMMs by members having less incentive to discuss and reflect within the workgroup as well as less drive to conduct project work more generally. Groups with external support can thus lead to a tendency in some members to exhibit less champion-like behaviour themselves. This causes a decrease in discussion, reflection, and action and makes the development of similar TMMs more difficult.

### 4.2.2. Differences

In addition to similarities, differences between the frameworks also indicate useful information about the development of TMMs and the varying degrees of success achieved in creating such models. These differences in developing similar TMMs might be most apparent in the establishment of the newly agreed upon year plan of 2019. While both Mobility and Circularity created detailed plans for the initial concept of the year plan, Liveliness had mostly focused on the generation of new ideas for activities and projects for the upcoming year rather than clearly stating which specific activities and projects the group would undertake to achieve its workgroup goal of making the area livelier. This is a clear reflection of a deeper difference between this workgroup and the other workgroups. While Mobility and Circularity both have measurable time-based goals, the Liveliness workgroup lacks such a specific goal. The main reason lies in the aim of the workgroup to increase the Liveliness of the central station area as argued by members of the workgroup themselves (L1, L2), individuals in organisational leadership positions (Chair, PM), and members of other workgroups (M1, C1, C2).

The goal differences are enhanced by the similarity of members' TMMs (or lack thereof). As the workgroup Liveliness aimed to create a coherent TMM among its members with workgroup goals and a similar understanding of the way in which the workgroup aims to achieve these goals, it ended up as a loosely-connected group of individuals rather than a workgroup. In other words, the workgroup Liveliness struggled with developing similar TMMs that both incorporated its non-specific aim and lead to an effective solution-creation process. This struggle for developing a coherent TMM is reflected in the limited success of the workgroup as expressed by members of the group (L1, E).

Another observation that is telling about the feelings toward the success of the workgroup is the phrasing by people external to the workgroup around its activities and projects, which have been described as “just cheering up the neighbourhood” (M1), “the most amusing” (Chair), and “[to keep] society around us… just cosy and nice” (C1).

Another attribute of the workgroups that might complicate or aid the development of similar TMMs is workgroup size. When a group is large, more individuals need to agree for convergence on TMM to occur. Conversely, when a group is small, the limited number of individuals having to agree upon goals and ways of achieving said goals might facilitate the process of developing similar TMMs. While the influence of larger workgroup sizes for Liveliness and Circularity was not explicitly mentioned as resulting in difficulty for the development of similar TMMs, this may well have been the case. Both the independent behaviour of the workgroup members in Liveliness and the creation of a core team in Circularity hint at workgroup size playing a role in TMM development. The workgroup Mobility, on the other hand, was significantly smaller, which resulted in efficient group meetings and easily agreed upon goals and solution-creation processes. The fact that this group also discussed more elaborately and reflected upon their way of conducting project work more regularly and inclusively than the other groups might have further enhanced the effects of smaller group size. This was mirrored in the core team of the Circularity workgroup showcasing how a larger workgroup could still facilitate the development of similar TMMs by having a limited number of prominent (and dominant) members.

The workgroup Circularity is a hybrid of the two other workgroups in the sense that it has a core team, like Mobility, with ‘peripheral’ members, like the less connected members of Liveliness. While the group does discuss and reflect on their solution-creation process, decisions on which tasks the group pursues and how it will do so are made by a core team of individuals within the workgroup. Although other members can contribute in meetings, the core team – consisting of three champions, including the chairperson – conduct the final say. This ensures effective goal setting and establishment of the way in which the group does their work yet allows ‘peripheral’ members to still add their own perspective in the process of (similar) TMM development.

The influence of individuals’ functions in their HO is also of note. This affects the level of motivation and the available expertise of a workgroup member and thus of the workgroup as a whole. In the case of Liveliness, function was not a relevant factor in the development of TMMs and most likely one of the reasons for a lack of similar (and concrete) TMMs. Both Circularity and Mobility showed the importance of function for the development of similar TMMs. In both workgroups, function also brought relevant expertise and different perspectives.[35] Here a distinction needs to be made regarding the way workgroup member perspectives contribute. In the workgroup Mobility, perspectives were mainly based on experience with solutions for Mobility challenges. Members of the workgroup Circularity relied more heavily on the (waste and goods transport) practices of their organisations, including relevant data, rather than their individual expertise to create solutions (M1, C1, meeting). There was thus more dependence on the active contribution and involvement of participating organisations than in the case of Mobility. This also had the positive consequence of having more direct reasons to generate involvement from the various home-organisations, resulting in faster goal alignment.

### 4.2.3. Theoretical Framework on the Development of Similar Team Mental Models

The cross-case analysis resulted in the establishment of three types of overarching categories based on their relevance to the development of the TMM: primary, secondary, and tertiary. Categories that

[35] Yet function is also a basis on which boundaries between members were limited through having the same function, cross-cutting it with home-organisation diversity.

are especially relevant for the development of similar TMMs in the three workgroups are motivation, time, HO, workgroup members, workgroup characteristics, and workgroup content. These are in turn related to each other. Other categories that are still relevant for the development of TMMs but to a lesser degree, i.e. secondary categories, are network connections, collaboration organisation, leadership, and decision-making. Results and project work are only relevant to the development of TMMs on a tertiary basis; they contain concepts concerned with the changing of TMMs based on achieving or failing to achieve goals rather than concepts related to the active development and shaping of similar TMMs. Figure 17 shows the framework for the development of similar TMMs resulting from the within-case and cross-case analyses. It therefore applies to all three workgroups. The remainder of this section elaborates on the discovered categories and the relationships among them as well as the specific role of HO diversity for the development of similar TMMs.[36]

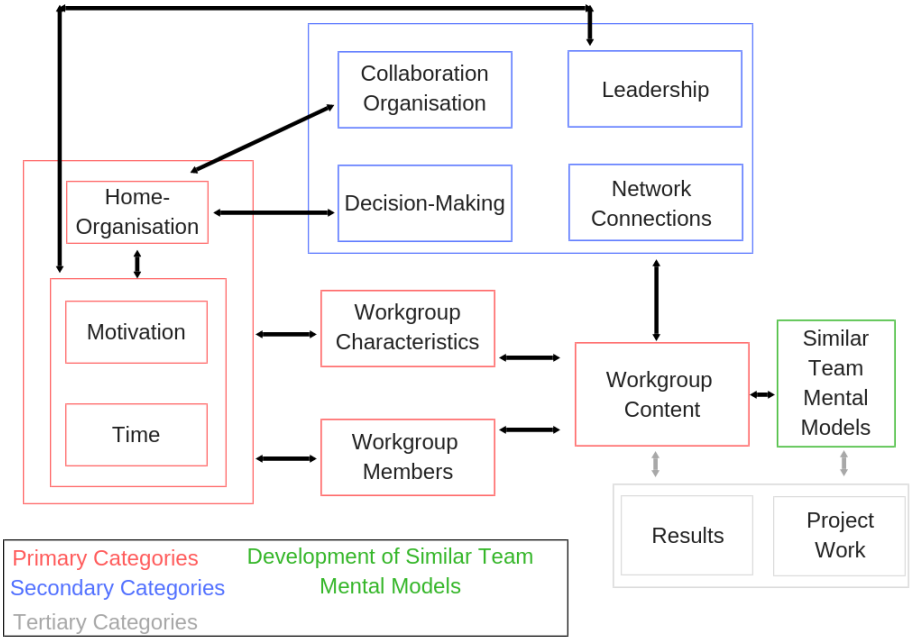


*Figure 17: Theoretical Framework on the Development of Similar Team Mental Models*

#### 4.2.3.1. Primary Categories: individual-level and workgroup-level

The primary categories relevant for the development of similar TMMs are highly interconnected. On the individual-level, the HO, motivation, and time are influenced by each other. When the sector, incentives, and culture – especially regarding sustainability – of a HO align with the mission of the collaboration organisation and specifically with the goals of the workgroup, motivation of employees involved in the workgroup is higher. Both home-organisational factors and motivation in turn affect how much time they (perceive to) have for collaboration work. This influences categories at the workgroup-level in the sense that home-organisations, motivation, and time influence how involved workgroup members are and whether they become champions or not. This also influences the creation of a core team and the more general characteristics of the workgroup, including its size and member flux. Both individual members and the workgroup as a whole affect the workgroup content, i.e. reflection and goal setting processes as well as the content of these goals and the meetings of the workgroup. Workgroup content is directly related to the development of similar TMMs: it influences how well TMMs are established and to what degree they are similar among members.

[36] See Appendix B for the codebook, a full overview of all concepts and their overarching categories.

#### 4.2.3.2. Secondary Categories: external to workgroup

A second group of categories is important to the development of similar TMMs albeit to a lesser extent than the aforementioned categories. These secondary categories tend to be (mainly) external to the workgroup and, therefore, have a less direct relationship to the TMM development process. These include the collaboration organisation (here: the GBCU) and leadership within this organisation. Leadership is affected by similar factors as workgroup members, especially motivation and time, and influences how all three workgroups or one workgroup specifically conduct their work. This is closely connected to the broader collaboration organisation through its mission, the involvement of participating organisations, and general participant meetings and discussions. The involvement of participating organisations depends on the HO (see above for the same argument for individuals). The HO also influences the decision-making process as incentives and goals need to (largely) align for collaboration to succeed. More broadly, workgroup content is also affected by network connections, which includes internal collaboration connections as well as external connections and connections within the various home-organisations. These connections can enhance solution-creation processes and provide additional perspectives and incentives to consider.

#### 4.2.3.3. Tertiary Categories

The last group of categories is only marginally relevant for the development of similar TMMs. For this reason, previous sections of this chapter have not explicitly discussed their roles in this process. Both project work and results affect the workgroup content and TMMs in an iterative manner. This means that both categories are affected by workgroup content and TMMs and that they in turn affect these categories. An example is that of project execution. The execution of projects is influenced by the solution-creation process and workgroup goals (concepts under workgroup content). Conversely, the execution of one specific project might affect how a workgroup views their goals and their way of working together (especially for future projects). The success or failure of projects also influences future (and potentially even current) goals of the workgroup as the experience from these projects is incorporated in the solution-creation process and workgroup goals. However, it does not directly affect workgroup members' expectations of each other and the work and how they perceive the goals and methods of achieving these goals of the workgroup. Project work and results are therefore more relevant for the changing (or evolution) of similar TMMs than their (initial) development.

#### 4.2.3.4. The Role of Home-Organisation Diversity

The various home-organisations (HOs) in this study have been found to exist in different fields/sectors, have different sizes, experience different incentives, and contain different cultures. Organisational cultures do not only influence how participating members conduct their work and what expectations and perceptions, i.e. mental models, they have regarding work. They also affect the degree to which a HO's goals 'naturally' align with the mission of the collaboration organisation (the GBCU). In this context, alignment mostly concerns the degree to which sustainability is imbedded inside the HO's culture and in their incentives. Workgroup members can have different (levels of) motivation for workgroup goals and projects, the collaboration organisation mission, and sustainability in general. Moreover, their function in their HOs and their connection to the area also affect their motivation. HOs thus influences how workgroup members react to each other and work together (e.g. due to different expectations and goals) as well as how a similar process happens in the collaboration organisation more generally. The effects of HOs are thus apparent in individual-level and workgroup-level categories (including through the creation of HO diversity) as well as in external categories (see framework above).

HO diversity includes differences in expectations and incentives. This influences goals of the collaboration organisation (the GBCU) and of the workgroups as well as the setting of these goals. More broadly, HO diversity affects workgroup content, which also includes reflection (the depth and width thereof), work environment, and workgroup meetings. High diversity increases the number of

different perspectives a workgroup might need to consider. This can result in boundaries between members (e.g. during discussions), making functioning as a group more difficult. Firstly, it makes goal alignment of participating organisations and the collaboration organisation at the organisation-level more difficulty. If HO diversity in a workgroup is high, there are more differences in cultures and incentives that need to be either integrated or downplayed to generate consensus on goals and how to achieve these goals. Establishing similarity of taskwork and teamwork mental models is thus made more difficult when HO diversity is high.

Conversely, high HO diversity makes a workgroup more aware of different ways in which to achieve workgroup goals and which goals to strive towards. As M1 argued multiple times throughout the research process (M1, meeting2), more perspectives not only lead to a more complete analysis of sustainability challenges, they also lead to higher acceptance among participating organisations for these goals and workgroups' approaches towards these goals. When a workgroup encounters resistance from participating organisations toward its goals, high HO diversity could create awareness of the reasons for this resistance. This also works in the opposite direction: incentives uncovered through high HO diversity could be leveraged to create interest among participating organisations. This happened in the case of the workgroup Circularity, which created interest from participating organisations by focusing on a project with positive incentives for all participating organisations: goods transport. This eased workgroup functioning.

The effects of HO diversity on the development of similar TMMs follows from its impact on workgroup functioning due to the direct connection between workgroup functioning/content and TMM development (Figure 18). HO diversity's effects are both positive and negative. When exploited effectively, it can ensure more holistic TMMs (regarding taskwork and teamwork) because of the diversity in member perspectives, which more easily share similarities with those of other workgroup members. However, HO diversity also gives rise to different incentives and cultures, resulting in contrasting representations of workgroup goals and how to achieve those goals. This complicates the development of similar TMMs within a workgroup.

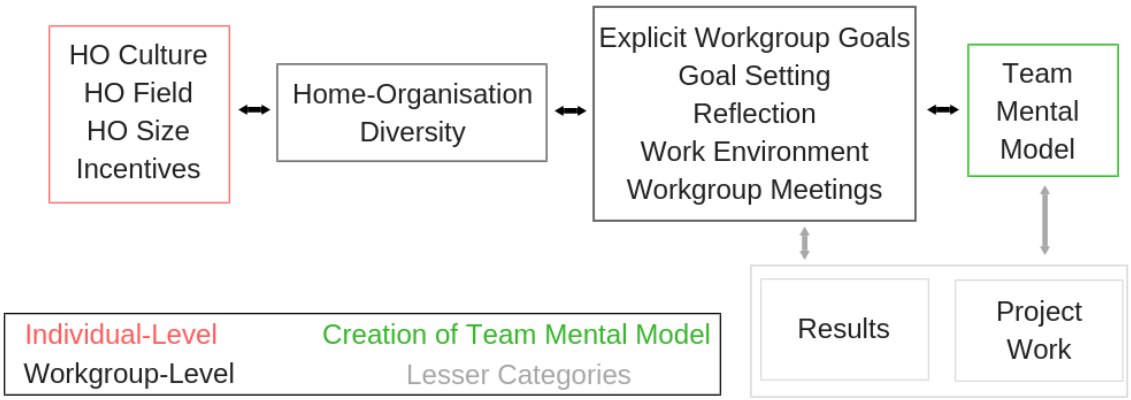


*Figure 18: Theoretical Framework on the Influence of Home-Organisation Diversity on Team Mental Model Development*

# 5. Discussion

This chapter compares the framework on the development of similar team mental models (TMMs) introduced in the previous chapter to previous research to expand on the theoretical level of the framework thus increasing its explanatory power (Bryman, 2016; Eisenhardt, 1989). Secondly, it discusses the limitations of the present study and suggests future research directions. Lastly, it discusses the implications, both theoretical and practical, of the theoretical framework on the development of similar TMMs in an inter-organisational workgroup setting.

## 5.1. Enriching Theoretical Framework using Previous Literature

This section discusses the parallels of this study with others for the overarching themes introduced in the previous chapter (workgroup-level factors, individual-level factors, and factors external to the workgroup). It elaborates on it by comparing the findings to other research.[37] Research from the fields of innovation sciences, networking theory, social identity theory, and theories on motivation and commitment are consulted for additional insights. Lastly, this section discusses the role of home-organisation (HO) diversity for the development of similar team mental models (TMMs) in more detail.

### 5.1.1. Workgroup-Level: Members, Characteristics, and Content

The three workgroups studied in this thesis exemplified different group structures. The workgroup Mobility consisted of a small, core team that worked closely together and relied on three champions for the development of its similar TMMs. The workgroup Liveliness displayed an extremely different structure with many members only loosely connected to each other. A seemingly 'middle ground' was found in the workgroup Circularity with its core team of champions and peripheral members adding onto the work of this core team. These different structures embody the dissimilar workgroup networks: members are connected to different degrees and in different ways. The concept of networks not only proved important in the internal structure of the three workgroups; it also impacted a workgroup's relation to external parties, HOs, and the collaboration organisation.

The structure of a workgroup is influenced by workgroup-level factors: members, characteristics, and content. To explain the examined differences between the three workgroups in this study, Rogers' (1983) theory on the diffusion of innovations can provide additional insights.[38] The notion of organisational slack (Rogers, 1983) is key for the solution-creation process as well as the development of similar TMMs. Organisational slack is "the degree to which uncommitted resources are available to an organisation" (p. 361). All three workgroups encounter challenges arising from the voluntary nature of the collaboration work. Available time, prioritisation, and the differences between paid and voluntary participation were highlighted continuously. More organisational slack in HOs is thus beneficial for inter-organisational collaboration workgroups.[39] This seems to be directly connected to the cultures of these HOs as well as their sizes. Larger organisations have more resources to actively participate in collaboration (as suggested by a small number of interviewees in this study). An example is Amethyst, a large governmental organisation, which is represented in every workgroup.

[37] There are many similarities between this thesis and the dissertation of Greer (2017) on elements of effective inter-organisational collaboration. This warrants a more elaborate discussion than this chapter allows. As such, Appendix F elaborates on similarities and differences between that study and the current thesis.

[38] Innovation theory is used more elaboratively when discussing the collaboration organisation (the GBCU) in Section 5.1.4. However, its relevance for workgroup structure warranted reflection on Rogers' (1983) work in this section.

[39] Organisational slack is necessary for an organisation to be innovative. This concept is not only connected to the theme of 'collaboration organisation' in participant involvement and discussion processes; it also influences individual-level factors such as prioritisation and available time for workgroup members. Participating organisations with organisational slack can send employees with more time and resources therefore increasing the likelihood of champions to arise.

Organisations with cultures encouraging collaboration and networking and subscribing to the mission or goals of the collaboration are more willing and able to send (motivated and time-committed) individuals to contribute to the workgroups.

Following Rogers (1983) further, the high centralisation of Mobility (and to a lesser extent of Circularity) enhances the implementation of projects and the execution of tasks (see also Tröster et al. [2014]). Moreover, the limited diversity in expertise and – therefore – perspectives allows for relatively easy consensus in discussions and reflections. In the case of Mobility this is enhanced through low HO diversity. The workgroup Circularity, on the other hand, limits boundaries from its high diversity by cross-cutting it with similarity in function (see Chapter 2). However, the factors that enhance implementation and execution in these workgroups also limit generating innovations or innovative solutions as limited diversity implies fewer perspectives making innovation more difficult (Cox & Blake, 1991; Rogers, 1983).

As the workgroup Liveliness is decentralised with limited similarities in expertise and perspectives, innovative solution-creation is easier for this workgroup (see also Tröster et al. [2014]). On the other hand, this workgroup has lower interconnectedness due to the disconnected projects, making innovation more difficult (see also Tröster et al. [2014]). The workgroup Liveliness struggles with implementation and execution in addition to reaching consensus on the workgroup's goals more broadly. Balancing these characteristics would allow the three workgroups to enhance the generation of innovative solutions as well as the implementation thereof. This balance would allow for establishing what Griffiths & Petrick (2001) referred to as the organisational architecture ideal type of "network organisation", termed by others the "spider web organisation" (e.g. Quinn [1992, in Griffiths & Petrick, 2001]).

### 5.1.2. Individual-Level: Motivation, Time, and Home-Organisation

The workgroup-level factors discussed above are strongly influenced by individual-level factors discovered during the analysis. The most direct impact on the workgroup from these individual-level factors can be found in the presence or absence of workgroup champions. As argued in the previous chapter, champions are highly committed individuals (see also Greer [2017]). This commitment is the result of motivation, time, and home-organisational factors. The behaviour of champions can be described as what Aubé et al. (2018) termed 'proactive behaviour'. This is individual behaviour directed towards the future to change the team's situation or the way in which the team functions. According to Aubé et al. (2018) proactive behaviour influences team performance, the result of an effective solution-creation process. They emphasise the relationship between this type of behaviour and a perceived similar understanding of "the work to be done" (p. 804). In other words, Aubé et al. (2018) argue that the awareness of similar TMMs results in champion-like behaviour. This was observed in the workgroup Circularity most clearly due to the core team highlighting a common understanding among them.

However, according to Aubé et al. (2018), when group members do not have a similar understanding, this demotivates the members of the group and in turn results in less proactive behaviour. This was observed in the workgroup Liveliness as well as in the peripheral members of the workgroup Circularity. Relatively low motivation (compared to the core teams of Circularity and Mobility) resulted in the workgroups establishing fewer shared norms and expectations and, therefore, similar TMMs were less present (Greer, 2017; Mohammed et al., 2010). Conversely, this resulted in less motivated members than when there were similar TMMs confirming findings of Aubé et al. (2018) and Greer (2017). This shows how less similar TMMs can also affect the motivation of members, warranting the bidirectional relationships between the development of similar TMMs, workgroup-level factors, and individual-level factors in Figure 17. In other words, motivation does not

only influence the development of similar TMMs through workgroup-level factors; similar TMMs also influence workgroup-level factors and motivation.

Motivation and time factors are both influenced by the HO. HOs and their representatives with incentives and cultures focused on sustainability and active encouragement of employees for collaboration agree more quickly with workgroup goals. Linnenluecke and Griffiths (2010) discussed the influence of organisational culture on the adoption of corporate sustainability in the organisation. They categorise organisational cultures using the competing values framework (CVF) in which each of the four categories "outline how people think, how they organize their values and ideologies, and how they process information" (p. 359). Each category of organisational culture has a different understanding of adopting corporate sustainability, emphasising different aspects in the process (Linnenluecke & Griffiths, 2010). Organisations can either be integrated in their culture, i.e. have one dominant organisational culture, or be differentiated in their culture, i.e. have multiple organisational cultures co-existing. The latter is the case in inter-organisational collaboration (e.g. in the context of this thesis) as participating organisations have displayed different perspectives on the importance of sustainability for their (core) business and their willingness to collaborate for sustainability projects in the area. These different perspectives affect the motivation of workgroup members and the time they (perceive to) have for collaboration and in turn their level of involvement as well as involvement of the participating organisation as a whole (see below).

### 5.1.3. Factors External to the Workgroup

In addition to the work of Linnenluecke and Griffiths (2010) on the adoption of corporate sustainability, another perspective granting insights into participant involvement in the collaboration organisation is that of innovation theory. Innovation theory can explain why participating organisations differ in their involvement in the collaboration organisation as well as the effects of the different network connections at play within the collaboration context. One of the most influential works in the field of innovation theory is by Rogers (1983) on the 'diffusion of innovations'. In his work, he elaborated on the decision process around adopting an innovation and why some adopters did so earlier than others. In addition to characteristics of innovative organisations discussed below, the concept of 'compatibility' is relevant to the present discussion. This is the degree of similarity between the innovation and (1) values and beliefs, (2) previously introduced innovations/ideas, and (3) (perceived) need for innovations. Compatibility thus encompasses aspects of organisational culture and incentives influencing willingness to adopt an innovation (cf. Greer, 2017). Higher compatibility between workgroup goals and organisational cultures and incentives might therefore help explain why some HOs contribute more actively –as whole organisations and as individuals – to the collaboration organisation than others.

Although Rogers (1983) mainly focused on the individual innovation adopter, he also discusses three categories of characteristics of innovative organisations: individual/leader, internal and structural, and external. When leaders are more likely to adopt innovations, they can influence other individuals to do the same. In the context of this thesis, this implies that when leaders are open to workgroup goals and exhibit commitment themselves, they inspire others to become more proactive. External factors, including the degree to which the system in which the organisation is embedded is open to innovation, also influences organisation innovativeness. Internal structural characteristics include considerations of organisational culture and structures within the organisation. Reviewing hundreds of innovation studies in the 1960s and 1970s, Rogers (1983) concluded that a centralised structure inhibits the innovativeness of an organisation (or group) while encouraging implementation of innovations. This was observed in the workgroups Mobility and Circularity and might give a reason for why these workgroups had more similar team mental models (and effective workgroup functioning) than the workgroup Liveliness.

Conversely, the amount of available expertise enhances innovativeness yet complicates creating convergence on innovations. This is the same argument as used in team diversity and TMM literature discussed extensively in this thesis. Another characteristic useful for innovation is interconnectedness, the linking of units in a network to share ideas and knowledge (cf. Tröster et al., 2014). The three workgroups exhibited different network connections. Network connections were partly influenced by the HOs of workgroup members, which provided pre-existing networks inside HOs. Other important connections for the functioning of the three workgroups were external. External networks were influenced by workgroup-level factors discussed previously, including different workgroup structures. These structures influenced the size, attributes, and impact (on the solution-creation process and the development of similar TMMs) of external networks.[40]

Diversity in external networks is generally enhanced when workgroup members are dissimilar (Reagans, Zuckerman, & McEvily, 2004). However, resources embedded in external networks of workgroup members cannot always be utilised. Which resources are used and how depends on both the internal and external network structures of a group (Reagans et al., 2004). A densely connected core team (comprised of champions) is beneficial for implementation and execution processes, while a (large) external network allows for creative problem-solving (Reagans et al., 2004). When these co-exist – a condition approached in the workgroup Circularity – a workgroup can use diversity in expertise and resources (from external sources) effectively.

However, reliance on one (or few) members at the centre of the workgroup structure with less emphasis on 'peripheral members' might also have negative consequences. According to Tröster et al. (2014), "excessive network centralization contributes to (1) an overburdening of the central individuals in the team and (2) elicits the resentment of those relegated to the margins of the network" (p. 247). Although the central individual or individuals have more impact on the development of similar TMMs and the solution-creation process, this may also lead to an overburdening of these individuals and failure or falling away of a central member might cause major disruption in the workgroup (Tröster et al., 2014). These risks are thus present in the workgroup Mobility with its reliance on the paid workgroup member and in the workgroup Circularity as the core team (and especially the chairperson) contribute significantly more than other members.

### 5.1.4. Team Mental Models and the Role of Home-Organisation Diversity

The work of Linnenluecke and Griffiths (2010) discussed earlier in this chapter is also beneficial for discussing the role of champions and leaders in developing similar TMMs. Establishing similar TMMs would benefit from a shared culture as shared values and ideologies could allow groups to more effectively agree on goals and methods of how to achieve these goals (cf. Greer, 2017). This would entail integrating the culture of a workgroup to ensure one dominant "workgroup culture" (see Section 2.4.2.). However, the existence of multiple cultures as a result of HO diversity might limit the influence of champions on developing similar TMMs (Linnenluecke & Griffiths, 2010). As argued previously, diversity in organisational cultures leads to a diversity in perspectives and therefore to group members having dissimilar mental models (see also Toader & Kessler [2018]). According to Toader and Kessler (2018), information elaboration can allow for effective use of dissimilar mental models in group members to leverage their diversity for higher group performance (see also Van Knippenberg et al. [2004] and Van Knippenberg & Mell [2016]).[41]

[40] Brass et al. (2004) emphasised that the key to a large variety of resources was a network rich in so-called 'structural holes' (a term first coined by Burt (1992), "the absence of a link between two contacts who are both linked to an actor" (p. 799). This gives the connecting actor (or team member) both additional information and the power over the connection (Brass et al., 2004; Büchel et al., 2013; Jackson & Joshi, 2011).

[41] It is important to note that Toader and Kessler (2018) seem to conflate dissimilar knowledge-based mental models of individuals with having dissimilar team mental models. In their work, they appear to equal knowledge diversity and diversity in perspectives to dissimilar team mental models. However, as argued extensively by

The development of similar TMMs relates to the processes of so-called divergence and convergence (Boon et al., 2014; Harvey, 2013; Toader & Kessler, 2018). Although these processes are generally used to refer to one-time (or at least bound) solution-creation processes, these concepts can also shed light on the development of similar TMMs for longer-term workgroups. Divergence concerns the use of multiple perspectives resulting from one or more types of diversity for creativity and innovation (Boon et al., 2014; Harvey, 2013). It increases to what extend a group relates to a challenge holistically. Convergence, on the other hand, includes processes that ensure a group comes to one solution, i.e. a collective end-result (see also Toader and Kessler [2018] and Van Knippenberg et al. [2004]). This can be achieved through creating a similar understanding of both task- and teamwork and thus similar TMMs (cf. Mohammed et al., 2010; Toader & Kessler, 2018).

To be more effective at generating similar understanding in a workgroup, members should first be aware of their different perspectives to then develop similar TMMs (Linnenluecke & Griffiths, 2010; cf. Van Knippenberg et al., 2004). This requires a process like Van Knippenberg and colleagues' (Hoever et al., 2012; Van Knippenberg et al., 2004, 2013; Van Knippenberg & Mell, 2016) information elaboration process (see Section 2.3.4.). After creating salience of member differences, convergence requires a group to work together to use these differences to create an end-product or solution (Toader & Kessler, 2018). In the case of HO diversity, differences are based on organisational culture and incentives. Especially when these cultures and incentives conflict within a workgroup, convergence and by extent the development of similar TMMs is made more difficult (Greer, 2017).

As discussed in Section 2.3.5., HO diversity belongs to the category of surface-level diversity. Inter-organisational workgroups tend to be aware of the organisations fellow workgroup members come from, indicating HO diversity to be an easily observable trait (Harrison et al., 1998; Jackson & Joshi, 2011). Harrison et al. (2002) argued that surface-level diversity traits can proxy for deep-level diversity. These characteristics include motivations, expertise, and prioritisation, i.e. perceived time available. Moreover, Chapter 2 highlighted the possible connection between organisations and their cultures and the mental models of their employees. HO diversity would result in different mental models among workgroup members, i.e. deep-level diversity. Workgroup members expressed both directly (during interviews) and indirectly (during workgroup or general meetings) that organisational culture and incentives are vital to the motivation, time available, and ultimately involvement of participating organisations and individuals alike. These factors determined workgroup content including goal setting and reflection. Workgroup content was the decisive factor for whether and how similar TMMs were established in the workgroup. HO diversity can thus be a relatively good proxy for the deep-level characteristic of mental models.

Deep-level diversity can lead to boundaries between workgroup members as exemplified by the work of Edmondson and Harvey (2017) on knowledge diversity. Similar to this type of diversity, HO diversity (as a proxy for TMM diversity) might also lead to boundaries for successful collaboration (cf. Greer, 2017). Moreover, there is commonality with Van Knippenberg et al.'s (2004) model on social categorisation (causing boundaries) and information elaboration (overcoming boundaries). The social categorisation process is generally avoided in these three workgroups as HO diversity mainly manifests itself as variety rather than separation or skew (see Figure 1 in Chapter 2). Workgroup members, spokespeople, and people in leadership positions argued that a larger variety in HOs benefits creativity

Mohammed et al. (2010), the team mental model concept does not just include knowledge structures. Team mental models also include the structures around task- and teamwork and thus how the group functions and what it aims to achieve rather than just perspectives. Having noted this conceptual difference, the work of Toader and Kessler (2018) still provides useful insights into how home-organisation diversity as a precedent of dissimilar mental models influences team performance through workgroup processes such as information elaboration and TMM development.

and/or degree of impact. When separation occurred due to different incentives and cultures of HOs, this created syntactic, semantic, and, most importantly, pragmatic boundaries (see Section 2.3.4.). Pragmatic boundaries resulted in asymmetric goals (Pearsall & Venkataramani, 2015) and mainly affected goal setting and discussions. Skew is only an occasional manifestation of HO diversity as only few individuals have stated that some HOs allow their participating employees more time for tasks pertaining the GBCU. This is the result of HO size and culture (and therefore resources) as argued by these individuals. However, no actively participating individuals seemed to support these claims, indicating that HO diversity mainly manifests itself as variety and occasionally as separation.

Because of this, HO diversity was generally perceived as positive by workgroup members and many indicated that this was due to the goal or mission that connected them: all participating members wanted to enhance the sustainability of their surroundings and the organisations in the area. This shows similarities with the work of Hietajärvi and Aaltonen (2018) discussed in Chapter 2. The team they observed developed a shared identity independent from their various HO inside the project team. They had thus overcome the barriers often associated with diversity, such as different professional language (Edmondson & Harvey, 2017), to develop similar TMMs. The three workgroups examined here, especially Mobility and Circularity, and the collaboration organisation more generally show the same behaviour wherein participating individuals identify with the goals of the GBCU and the workgroups. Although this identification differs in intensity among members and all members still simultaneously identify with their HO, this shared motivation is a strong indicator of a similar understanding of the goals of the GBCU and the workgroups, i.e. a similar taskwork TMM.

The common goal and similar TMMs show many similarities to social identity theory more generally (e.g. Hogg and Terry [2000] and Hornsey and Hogg [2000]). Social identity theory suggests that groups can either accommodate different identities – parallel to mental models in this analogy – by establishing a superordinate identity that allows for the existence of subgroup identities or impose a superordinate identity eliminating subgroup identities (see Chapter 2). One study that investigated the potential benefits of dual identity and the tensions created in the interplay of identities is the longitudinal case study of Kourti et al. (2018) who investigated the interaction of collaborative and non-collaborative identities in the context of inter-organisational collaboration for the educational support of children with disabilities. They found that the "delicate balance between […] opposing but equally important identities" was vital to the collaborative work they examined (Kourti et al., 2018, p. 516). In the case of HO diversity, mental models of individuals and overarching TMMs appear to coexist as the mission of the collaboration organisation as well as the goals of workgroups are added to the previously existing motivations and commitments of participating individuals (cf. Greer, 2017).

## 5.2. Limitations and Future Research

This section elaborates on various limitations of this thesis. In doing so, it suggests multiple directions for future research to build on the current study and examine the influence of home-organisation (HO) diversity on team mental models (TMMs) using different methods and in different contexts. Lastly, it calls for future research to investigate the connection between social identity theory and team diversity theory in more detail.

### 5.2.1. Team Mental Model Assessment

This study addressed multiple gaps in existing research on team diversity, inter-organisational collaboration, and sustainable innovation. One of these gaps was the relative absence of qualitative assessments of the effects of team diversity on team processes. Using a Grounded Theory approach, the influence of HO diversity on the development of similar TMMs was investigated and found to be multi-faceted and complex. Quantitative methods would not have allowed for the same complexity to be examined in this relationship as they provide static insights rather than enabling the researcher to investigate dynamic processes (Bryman, 2016; Mohammed et al., 2010). The use of qualitative

methods is rare in the field of TMM research, however, and the current Grounded Theory approach appears to be less utilised as most TMM research employs pair-wise ratings and concept mapping, both quantitative approaches, to assess TMMs.

Qualitative assessment of TMMs furthermore allowed for deep insights into the content of TMMs. This thesis investigated content of TMM's regarding both taskwork and teamwork, i.e. what groups do and what is done by whom and how. However, the structure of TMMs is more difficult to assess using qualitative methods as it heavily relies on researcher interpretation to deduce the TMM structure during the coding process (Mohammed et al., 2010). Because of this, the current study did not investigate the influence of HO diversity on TMM structure. The structure of TMMs concerns how concepts are organised in the mind of an individual (Mohammed et al., 2010, 2015) while TMM content reflects what these concepts are (Mohammed et al., 2010). Structure thus reflects how individuals connect various components of taskwork and teamwork to each other. Agreement on TMM structure as well as content has been found to predict team performance more accurately than similarity of TMM content by itself (Mohammed et al., 2010, 2015). Future research should thus build on the current study and aim to obtain insights into how HO diversity influences the development of TMM structure.

### 5.2.2. Workgroup Creation

The current study followed three workgroups over an extended period of time. With the use of documents and reflections during interviews, the development of similar TMMs could be investigated over multiple years. However, real-time observations are more objective than interviewees' reflections on (past) events (Bryman, 2016). The development of similar TMMs could therefore not be objectively investigated throughout the entire life cycle (up to the present) of the three workgroups. Mohammed et al. (2015) state that TMMs evolve through three stages: orientation, differentiation, and integration. As the workgroups already existed for multiple years at the start of the research period, it was assumed workgroups would be in the last phase of TMM evolution.

Successful integration, the final stage of TMM development, leads to an effective solution-creation process (cf. Mohammed et al., 2015). The current study therefore focused on similarity in TMMs between workgroup members. However, the development of similar TMMs in the earlier phases of these workgroups could not be observed. According to Farh et al. (2010), there are significant differences in team dynamics between recently established workgroups and longer existing workgroups. Future research should aim to investigate the development of similar TMMs in workgroups from workgroup inception to the present (or workgroup termination) to assess the generalisability of the current findings to such a context.

### 5.2.3. Applicability to Different Collaborations

Although there are large differences between the various organisations participating in the GBCU, one interviewee (S7) pointed out that most of them are still service-based and located in office buildings. Moreover, none of the participating organisations were non-profit organisations or knowledge institutions. This limits the generalisability of this thesis to the context of inter-organisational collaboration with, for example, production organisations and non-governmental organisations (NGOs). Different types of organisations tend to be accompanied by different organisational cultures as found in the current study with governmental organisations and for-profit service-based companies. As different organisations have different incentives (especially in the case of NGOs and knowledge institutions), HO diversity might manifest itself more as separation in those types of inter-organisational collaboration. HO diversity might therefore more negatively influence the development of similar TMMs in workgroups operating in such a collaboration organisation.

Conversely, these organisational differences also provide vastly different perspectives, networks, and resources, thus potentially allowing HO diversity to manifest itself primarily as variety, a 'positive' manifestation of diversity, rather than separation or skew, 'negative' manifestations of diversity (see Section 2.3.2). This would positively influence the solution-creation process. The applicability of the created framework on the development of similar TMMs as influenced by HO diversity should thus be tested in different contexts. This could be most readily done by studying the other green business clubs in the Netherlands as well as other inter-organisational collaborations working on sustainability challenges external to the core business of their participants. Additional attention should be paid to collaborations with different types of companies as well as NGOs and knowledge institutions. Future research should investigate whether home-organisational differences are increased in these collaborations and what the consequences are for the development of similar TMMs and solution-creation processes more generally.

### 5.2.4. Social Identity and Team Mental Models

This thesis – most notably chapter 2 and the current chapter – have alluded to the connection between social identity and TMMs. Many have argued that for a group to establish a collective (or group) identity it is necessary to first create common ground (Gioia, Patvardhan, Hamilton, & Corley, 2013; Greer, 2017). The most vital factor is a common goal to unite all group members for a single purpose (Greer, 2017). By extension the group is then also united by the process through which they agree to achieve this goal (Greer, 2017). As argued earlier in this chapter, this is similar to the relationship between TMMs and solution-creation processes; the prerequisites for a collective identity thus seem identical to what this thesis and others (e.g. Cannon-Bowers et al., 1993) have referred to as similar TMMs. Following the work by Greer (2017) and the current study, future research should investigate this link further. In doing so, it should draw on collaboration theory, social identity theory, and team diversity theory to reach a more holistic understanding of the dynamics of workgroups and teams and the factors that lead to successful collaboration.

## 5.3. Implications

This section elaborates on the main theoretical and practical implications of the current study. It discusses the literature gaps addressed in this thesis, including methodological limitations of previous research in the fields of team diversity and team mental models (TMMs). Secondly, it discusses the roles of committed members and leaders in inter-organisational collaboration in addressing misalignment between organisational cultures and incentives and workgroup goals.

### 5.3.1. Theoretical Implications

As mentioned earlier, the current thesis addressed multiple gaps in previous literature. Most notably, it connected the fields of team diversity and inter-organisational collaboration in the concept of 'home-organisation diversity'. Inter-organisational collaboration literature often investigates collaboration at the organisational-level within supply chains or other partnerships. However, the team-level of inter-organisational collaboration has been relatively underexplored. Conversely, team diversity literature focuses on the relationships between individual team members and between groups, but often neglects the organisational influences on these individuals and groups. This thesis therefore strengthened the field of team diversity by directly investigating diversity resulting from different home-organisations and the field of inter-organisational collaboration (and by extent the fields of collaboration and networking theory) by providing a novel perspective using team diversity insights in the context of sustainability challenges.

As discussed in Chapter 2, despite various calls for more longitudinal and qualitative methods to be used, for the vast majority of its studies team diversity research has employed static, quantitative methods. However, multiple qualitative studies have shown that this different methodological angle

can provide more dynamic and detailed insights into the causal relationships between various types of team diversity and team processes (e.g. Ely & Thomas, 2001). The same could be argued for the field of TMMs, which has even more heavily relied on quantitative assessments of TMMs. This thesis provided rich, qualitative insights for both fields, addressing two persistent methodological gaps.

### 5.3.2. Practical Implications

The theoretical implications discussed above gave rise to various practical implications. Similar to the work of Greer (2017) on effective inter-organisational collaboration, this thesis showed there are multiple components vital to the success of collaboration, including stimulating home-organisations and high individual motivation in workgroup members. To achieve the best results from inter-organisational collaboration, organisations should thus provide their participating employees with enough resources to actively engage in the collaboration organisation. Simultaneously, workgroups should build themselves around these individuals, establishing a core team, i.e. a relatively centralised group structure, for efficient and effective collaboration for sustainability challenges. Workgroup chairpersons are in the best position to start these core teams by creating strong connections with a few workgroup members as they should have the best overview of which members are able to show the required commitment to the collaboration.

However, committed workgroup members are not enough to achieve effective inter-organisational collaboration. This thesis showed how home-organisations play a significant role in sustainability challenges even when these appear to be external to the core business of participating organisations. Misalignment between these cultures and incentives and the goals of the collaboration organisation and its workgroups might occur, resulting in pragmatic boundaries within the collaboration. When this happens, groups encounter significant challenges in developing similar TMMs and especially in creating an effective solution-creation process for sustainability challenges. Differences in cultures and incentives should thus be discussed in as much detail as possible to ensure that all members can be “on the same page” (Mohammed et al., 2015, p. 694) regarding the goals of the collaboration and how to achieve them. Individuals in leadership positions, whether internal or external to the workgroups, and champions within workgroups are in the best position to start and lead these discussions.

# 6. Conclusion

Organisations are increasingly aware of the need for innovation and creative problem-solving to face environmental and social sustainability challenges (Crews, 2010; Hekkert et al., 2007; Lozano, 2007; Manning, 2017; van Huijstee & Glasbergen, 2010; Vermeulen & Witjes, 2016; WBCSD, 2010). Most of the research into sustainable innovation has tended to connect the ability of an organisation to innovate in a sustainable manner with firm performance (Mousavi et al., 2018; Olsen et al., 2017; Przychodzen et al., 2016). However, organisations often struggle with these complex challenges when operating individually. Collaboration between different organisations is, therefore, becoming increasingly prevalent to face environmental and social sustainability challenges through innovation and creative problem-solving (Boon et al., 2014; Faems et al., 2005).

Inter-organisational collaboration can take place in network-based partnerships which connect otherwise unrelated organisations in inter-organisational teams or workgroups (e.g. Bakker, 2010; Faems et al., 2005; Grekova et al., 2016; Manning, 2017). One example of such a partnership is the Green Business Club Utrecht Centraal (GBCU). The GBCU is a collaboration organisation in which fifteen organisations work together to increase the sustainability of the central station area of Utrecht, the Netherlands. For this, it has three workgroups focusing on three different areas of sustainability: Liveliness, Mobility, and Circularity (Green Business Club Utrecht Centraal, n.d.). Collaboration organisations like the GBCU use sustainability projects for improving both the sustainability of the participating organisations as well as of the geographical area in which they operate. However, most research into (sustainable) inter-organisational collaboration has tended to focus on the firm- (Mousavi et al., 2018; Olsen et al., 2017; Przychodzen et al., 2016) and individual-levels (Delmas & Pekovic, 2018; Fellnhofer, 2018) of sustainable innovation rather than examining the workgroup-level.

Workgroups have often displayed more innovative and creative capabilities than individuals by using diverse knowledge bases, resources, and perspectives (e.g. Curşeu et al., 2013; Harvey, 2013; Homan et al., 2007; Przychodzen et al., 2016). However, diversity in teams can also result in tension and conflict within a workgroup. Inter-organisational workgroups might bring an even higher diversity in perspectives by spanning organisational boundaries. Workgroup members come from different 'home-organisations' (Ehlen et al., 2014; Hietajärvi & Aaltonen, 2018) and are influenced by different organisational cultures (Schneider et al., 2011). These members might therefore have different 'mental models' (Cannon-Bowers & Bowers, 2011; Cannon-Bowers et al., 1993; Mohammed et al., 2010). However, for workgroups to function effectively, they should develop similar mental models of what the team's goals are and how to achieve these goals, i.e. similar team mental models (Mohammed et al., 2010, 2015). The impacts of home-organisation diversity on the development of similar team mental models, a key process for the functioning of a group, therefore appears to be under-explored in the literature. As such, this thesis has aimed to address this gap by examining the following research question:

> *How does home-organisation diversity influence the development of similar team mental models for the solution-creation process for sustainability challenges?*

Most research on team diversity and team mental models has employed quantitative methods (see Horwitz and Horwitz [2007]). However, quantitative methods do not allow for insights into dynamic and longitudinal processes as is the focus of this thesis (Bryman, 2016). As such, this thesis used a qualitative approach to answer the main research question and address this methodological gap in the literature. More specifically, a Grounded Theory approach was used to uncover the way in which home-organisation diversity influences the development of similar team mental models in the three workgroups of the GBCU. Through the analysis of documents, semi-structured interviews, and meeting observations, insights into this relationship were obtained both in real-time and retrospectively. A Grounded Theory coding process of open, axial, and selective coding was employed

as well as qualitative data analysis by means of data reduction, data visualisation, and conclusion drawing and verification (Corbin & Strauss, 1990; Glaser & Strauss, 1967; Miles & Huberman, 1984). Using these methods, six sub-questions leading into the main research question restated above were answered. This culminated in a framework on the development of similar team mental models in the three workgroups of the GBCU. Moreover, it gave insights into the role of home-organisation diversity in this process.

Home-organisation diversity is the result of workgroup members coming from different home-organisations with different cultures, incentives, and sizes as well as being based in different (industry) sectors. As home-organisations affect their employees and the commitment they can make to the collaboration organisation, home-organisation diversity can result in underlying deep-level diversity – most notably in mental models. In other words, home-organisations affect the ideas workgroup members have about the goals of the workgroup and the way in which to achieve these goals. This diversity influences the development of similar team mental models in a workgroup both positively and negatively. On the one hand, it allows for more holistic team mental models, enabling the various workgroup members to include considerations of other organisations. However, it simultaneously can lead to boundaries between workgroup members as higher diversity leads to differences in cultures and incentives. When these differences are large and many, as is the case when home-organisation diversity is high, it makes the development of similar team mental models more difficult. These boundaries should thus be overcome to develop similar team mental models in a workgroup and therewith an effective solution-creation process for sustainability challenges.

The positive and negative effects of home-organisation diversity on the development of similar team mental models make this type of diversity similar to previously studied types of diversity, including racial diversity and functional background diversity (e.g. Van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998). This thesis thus extended the work of others on team diversity in emphasising how a new type of diversity, home-organisation diversity, gives rise to benefits and difficulties in the functioning of workgroups. Moreover, a qualitative approach and a focus on team mental models was taken, which were perspectives underdeveloped in previous team diversity research such as work by Van Knippenberg and colleagues (Hoever et al., 2012; Homan et al., 2007; Van Knippenberg et al., 2004, 2013; Van Knippenberg & Mell, 2016; Van Knippenberg & Schippers, 2007) and Edmondson and Harvey (2017). Home-organisation also appears to be connected to deep-level diversity, e.g. in mental models (Harrison et al., 2002), yet a connection between the fields of collaboration theory and team diversity literature appeared to not yet have been made prior to this thesis (cf. Greer, 2017). This thesis thus built on the work of others in innovation theory (for example the prominent work of Rogers [1983]) and collaboration theory (e.g. Greer, 2017) by using a team diversity perspective in the context of sustainability challenges.

The workgroups of the GBCU have showcased how high home-organisation diversity might result in both positive and negative effects on the development of similar team mental models and, by extension, on workgroup functioning and performance in the context of sustainability challenges. This diversity in organisations might not only allow for more perspectives and more holistic solution-creation processes, it might also result in boundaries between workgroup members making collaboration more difficult. This thesis has highlighted these different effects in the context of workgroups collaborating through short-term and long-term projects for increasing the sustainability of their home-organisations as well as of the geographical area they collaborate in. Increasingly organisations work together in workgroups to face the complex problems of environmental and social sustainability challenges. The role of home-organisation diversity should therefore be studied in more detail to fully exploit the value-in-diversity often heralded in team diversity literature to enable diverse workgroups to solve complex sustainability challenges.

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Interviewees, documents, and meetings used for analysis as stated in Chapter 3 are shown in the tables below.

| Documents | Reference Code |
|---|---|
| Year Plan 2015 | YP2015 |
| Year Plan 2016 | YP2016 |
| Year Plan 2017 | YP2017 |
| Year Plan 2018 | YP2018 |
| Year Plan 2019 | YP2019 |
| Annual Reflection Report 2016 | AR2016 |
| Annual Reflection Report 2017 | AR2017 |

| Meeting Observations | Reference Code | Date | Attendees |
|---|---|---|---|
| Board Meeting 1 | OB1 | 07/11/2018 | Chair, PM, U + 1 |
| Participant Meeting 1 | OP1 | 13/11/2018 | Chair, U, C1, C2, M1, L2, S2, S3, S4, S5, S8 + 3 |
| Liveliness Meeting 1 | OL1 | 17/12/2018 | L1, L2, E + 3 |
| Mobility Meeting 1 | OM1 | 18/12/2018 | M1, U + 4 |
| Circularity Meeting 1 | OC1 | 20/12/2018 | C1, C2, U, PM + ~10 |
| Participant Meeting 2 | OP2 | 18/01/2019 | Chair, PM, U, C2, S4, S8 + 9 |
| Liveliness Meeting 2 | OL2 | 21/01/2019 | L1, L2, L3, E + 3 |
| Mobility Meeting 2 | OM2 | 30/01/2019 | M1, U + 3 |
| Liveliness Meeting 3 | OL3 | 18/02/2019 | L1, L2, L3, E + 2 |
| Board Meeting 2 | OB2 | 20/02/2019 | Chair, PM, U |
| Circularity Meeting 2 | OC2 | 07/03/2019 | C1, C3 + 4 |
| Participant Meeting 3 | OP3 | 12/03/2019 | Chair, PM, U, E, C1, C3, S2, S7 + 7 |

| Code | C1 | C2 | C3 | Chair | E | L1 | L2 |
|---|---|---|---|---|---|---|---|
| Position in GBCU | Chairperson Circularity | Workgroup member Circularity | Workgroup member Circularity | Chairperson Board | Programme Manager Liveliness | Chairperson Liveliness | Workgroup member Liveliness |

| Code | L3 | M1 | PM | S1 | S2 | S3 |
|---|---|---|---|---|---|---|
| Position in GBCU | Workgroup member Liveliness | Chairperson Mobility | Programme Manager | Contact Person Citrine | Contact Person Amethyst | Contact Person Aquamarine |

| Code | S4 | S5 | S6 | S7 | S8 | U |
|---|---|---|---|---|---|---|
| Position in GBCU | Contact Person Alexandrite | Contact Person Peridot | Previous Contact Person Amethyst and Chairperson Liveliness | Contact Person Spinel | Contact Person Garnet | Workgroup member Mobility, New Treasurer Board |

# Appendix A – General Interview Guide

## Interview Guide - General

*NB: Exact interview questions depend on the relevance to the interviewee's situation/role/case.*

**Joining**

- Why did you decide to join the Green Business Club Utrecht Centraal (GBCU)?
    - How does this compare with the other people in the GBCU?
    - Why are you paid, while others volunteer? How do you think this affects your position/role/way of working?
    - How did you become chairperson of your team?
- How would you describe the GBCU?
    - What do you perceive the goal of the GBCU to be?
    - How has this developed over time?
    - How would you describe the organisational structure of the GBCU? Why like this (how has this developed)?

**Project group**

- Which project teams are there? How has this structure developed?
- How would you describe each project team?
    - How do they differ in the way they work?
    - How do they differ in their goals?
    - How has their membership developed?
        - What happens when new people join the GBCU? (new organisation, new person)
        - How are they integrated in the team they join? Does this differ between teams?
    - Are these topics discussed in board and participant meetings? In other words, are differences and similarities between project groups and the consequences of this discussed?
- Which project group do you work at? Why this one and has this changed in the past?
- How many team members does this project group have?
    - How has this changed over time?
    - From which organisations?
- What do you perceive the goal of this project team to be?
    - How was this decided for the group?
- How would you describe the way your project team works?
    - How is it different from the other project teams? How was this decided?
    - How has the process of working together developed over time?
    - How do projects start (why and when) and what is the work process in projects like?
- How is your role in the GBCU related to the work of the project teams?
    - How do you communicate with them? How often and about what?
    - How does this affect their work process?

**Experience**

- How do you experience working at the GBCU?
- How do you experience the project work at GBCU?

        - Do you notice in working with others at the GBCU that they are from different organisations? How?
        - How do you think the work is influenced by many organisations working together?
        - How is working at GBCU different from or similar to working at your home-organisation?
        - What are the benefits and difficulties, according to you, regarding working with people from different organisations?
        - How do other team members think about working in a context like the GBCU?
    - How does your home-organisation think about GBCU?
    - How do you combine working at GBCU with working at your home-organisation?

**Programme Leader and Board**

- How would you describe your role within the GBCU?
    - What kind of work activities are involved with this role?
- How would you describe your role within the GBCU?
    - What kind of work activities are involved with this role?
    - How is your role in the GBCU related to the work of the project teams?
        - How do you communicate with them? How often and about what?
        - How does this affect their work process?

**Evaluation**

- How would you evaluate the past year?
    - Or the past few years, since you started at the green business club?
- How are you looking towards the new year?
    - What do you consider priorities for your workgroup?
    - What do you consider priorities for the GBCU more generally?

**Ending**

- What would you still like to share they we have not yet discussed regarding the research?
- Which other people (from your project group) should I talk to? Why these people?

# Appendix B - Codebook

| Category | Concept | Description |
|---|---|---|
| Collaboration Organisation | Collective Strength | Expression of having more authority and/or impact when operating as a collective of organisations as compared to an individual organisation for reaching goals (in line with workgroup goals) |
| | Discussion | Discussions (during general meetings) on the broader mission of the collaboration organisation and the goals of the various workgroups, excluding decision-making and specific goal setting |
| | Mission | Statement on the mission and goals of the collaboration organisation |
| | New Participant | Direct mentioning of newly joined/joining home-organisations for the collaboration organisation; Expression of the consequences of new home-organisations joining the collaboration organisation |
| | Organisational Goal Setting | Events/actions related to the setting of goals in the collaboration organisation overall |
| | Participant Involvement | Expression of (a high level of) active involvement or lack thereof in a workgroup, the collaboration organisation, or specific projects by a participating home-organisation |
| | Social Pressure | External pressure on home-organisations to participate in the collaboration organisation and to contribute to achieving the goals of the various workgroups |
| Decision-Making | Decision-Making Authority | Authority for making decisions about proposals, ideas, and/or projects for the workgroups - related to decision-making hierarchy within the home-organisation |
| | Decision-Making Process | Events/actions related to the method of making decisions in workgroups and/or the collaboration organisation in general whether on projects, goals, mission, or otherwise |
| Home-Organisation | HO Culture | Elements of home-organisational culture and/or their expression of its relevance to one or more workgroups, including how individuals (might) express characteristics originating from the culture of their home-organisation |
| | HO Field | Expression of relevance of field/sector in which a home-organisation operates for the functioning of workgroups or individuals specifically |
| | HO Size | Expression of the importance of the size of a home-organisation (for the number of participating members it provides to the collaboration organisation and their activity level in the collaboration organisation) |
| | Incentives | Mentioning of different incentives home-organisations have to (not) undertake or participate in certain actions/tasks/projects; Expression of (lack of) alignment in incentives or goals of one or more home-organisations with the mission of the collaboration organisation or the goals of one or more workgroups |
| Leadership | Role Chairperson | Statement on the role of collaboration organisation's chairperson |
| | Role of Board | Statement on the role of collaboration organisation's board as a collective, excluding statements for the chairperson specifically |
| | Role Programme Manager | Statement on the role of collaboration organisation's programme manager |
| | Workgroup Chairperson | Statement on the role of a workgroup's chairperson |
| Motivation | Function | Statement of relevance of an individual's or individuals' function at the home-organisation for choice of workgroup, functioning of workgroup, or achieving goals of workgroup |
| | Intrinsic Motivation | Direct mentioning of the phrases 'intrinsic motivation' and 'personal motivation'; Expression of motivation for joining and/or contributing to the functioning of a workgroup (or collaboration organisation) and/or achieving the goals of a workgroup (or collaboration organisation) intrinsic to an individual |
| | Place Connection | Expression of personal connection of an individual to the area (and the city more generally) in which the collaboration organisation operates, potentially related to personal motivation to contribute in the organisation |
| Network Connections | External Network | Connections with individuals, groups, or organisations external to the home-organisation and the collaboration organisation |
| | HO Network | Use of the network (of employees and executives) of the home-organisation (to further the goals of the collaboration organisation generally or a workgroup specifically) |
| | Internal Network | Use of the network (of employees and executives) of the collaboration organisation (to further the goals of the collaboration organisation generally or a workgroup specifically) |
| | Network Organisation | Effects of the collaboration organisation being a network organisation consisting of many home-organisations or expressions of the network nature of the collaboration organisation |
| | Municipality | Statement on the role of the municipality for the collaboration organisation and/or the functioning of a workgroup and the achievement of workgroup goals |
| Project Work | Project Execution | Examples of how specific projects have been (aimed to be) completed |
| | Project Experience | Explicit mentioning of experience gained from the execution and/or planning of a project for one of the workgroups |
| | Project Type | Examples of different projects and statements on whether these are, for example, long-term or short-term and internal or external to home-organisations; Explicit comparison between different projects for the sake of giving meaning to the impact of expressed differences |
| | Responsibility | Expression of how individuals or multiple individuals are (made) responsible for the execution of tasks and/or projects for a workgroup |
| | External Support | Individuals or organisations external to the collaboration organisation that contribute to the functioning of one or more workgroups and achieving the goals of those workgroups, whether long-term or on project-basis |

| Category | Concept | Description |
|---|---|---|
| Results | HO Impact | Impact from workgroup projects or the collaboration organisation more generally on the level of sustainability in one or more home-organisations |
| | Impact | Impact from workgroup projects or the collaboration organisation more generally on the level of sustainability in the area |
| | Knowledge Sharing | Expression of actions related to the sharing of knowledge/experience (or lack of sharing knowledge) among individuals and home-organisations active in the collaboration organisation as well as consequences of these actions and the reasons for knowledge sharing |
| | Mutual Benefits | Expression of mutual benefits for one or more home-organisations and potentially the collaboration organisation or general area experienced due to actions undertaken in the collaboration organisations, e.g. specific projects, or actions undertaken due to the network effect of the organisation |
| | Visibility | Statements on the visibility of actions/projects of the collaboration organisation and/or specific workgroups toward parties outside of the collaboration organisation |
| | External Communication | Communication with parties external to the collaboration organisation |
| Team Mental Model | Mental Model of Workgroup Goals | Statement on the goals of one or more workgroups, qualitatively indicating taskwork mental model |
| | Solution Creation Process | Statements about or examples of how a workgroup works together to achieve its goals, qualitatively indicating teamwork mental model |
| Time | Paid Contribution | Statements on the nature of the work conducted by individuals in the collaboration organisation and the workgroups more specificall who are in some way compensated (generally: paid) to do that worky, potentially 'contrasted to voluntary contribution' |
| | Prioritisation | Direct or indirect expression of how individuals prioritise tasks/projects related to workgroups compared to tasks/projects for their work at their home-organisations |
| | Resources (Time) | Direct or indirect expression of time pressure or a lack of time available experienced by workgroup members and other individuals participating in the collaboration organisation |
| | Voluntary Contribution | Statements on the voluntary nature of the work conducted by individuals in the collaboration organisation and the workgroups more specifically, potentially 'contrasted to paid contribution' |
| Workgroup Characteristics | Core Team | Collective of workgroup members who are identified by others and/or themselves as the few people in the group most important for achieving the goals of the workgroup, decision-making in the workgroup, and other processes vital to the functioning of the workgroup |
| | HO Diversity | Expression of positive, neutral, or negative consequences of home-organisation diversity in the collaboration organisation and/or a workgroup |
| | Member Flux | Statement on the addition, substitution, and/or substracting of a workgroup member and (optionally) an expression of the consequences thereof |
| | New Member | Direct mentioning of new members of a workgroup; Expression of the consequences of new members joining a workgroup either with a specific individual in mind or not |
| | Workgroup Size | Expressions of the number of members in a workgroup |
| Workgroup Content | Goal Setting | Events/actions related to the setting of goals in one or multiple workgroups, including goal setting around new workgroups |
| | Reflection | Actions related to or expressions of behaviour in which the workgroup reflects on the way in which they work and their goals, potentially looking back at past events/experiences |
| | Work Environment | Expression of how workgroup members experience the atmosphere/environment of the workgroup in which they participate, including notions of friendliness |
| | Explicit Workgroup Goals | Explicit (written) statement on the goals of one or more workgroups |
| | Workgroup Meetings | Statement on the content and/or frequency of workgroup meetings |
| | Workgroup Progress and Performance | Statements on the general performance of a workgroup as judged by an individual or group as well as how a workgroup has progressed/evolved/changes throughout the years of its existence in terms of how the workgroup functions (contrast with 'solution creation process', which includes how the group currently functions) |
| Workgroup Members | Commitment | Expression of commitment to workgroup goals and/or the mission of the collaboration organisation, including a willingness to make time for these goals |
| | Individual Involvement | Expression of (a high level of) active involvement in a workgroup or the collaboration organisation by an individual, including notions of individual energy or enthusiasm |
| | Ownership | Expressions of or about a feeling of projects, workgroups, or the collaboration organisation more generally being a part of one's identity and having a high commitment to the completion of tasks/projects because of this feeling |
| | Champion | An individual identified by others and/or themselves as important contributors to the workgroup in terms of resources (time, expertise, and connections) and content for achieving workgroup goals |
| | Expertise | Statement of relevance of an individual's or individuals' expertise, knowledge, and skills for choice of workgroup, functioning of workgroup, or achieving goals of workgroup |
| | Workstyle | Actions and/or behaviours that depict the workstyle of an individual or multiple individuals |

# Appendix C – Team Mental Model Workgroup Liveliness

This group-level team mental model comprises both taskwork and teamwork, which are here operationalised as what the goals of the workgroup are (according to the workgroup members) and how they are to be achieved, respectively. It is based on the similarities found in team mental models from workgroup members. As stated in Section 3.2., qualitative analysis of interviews and meeting observations allowed for elicitation of the team mental models (Mohammed et al., 2010). In the case of the workgroup Liveliness this included interviews with L1, L2, L3, and E as well as meeting observations OL1, OL2, and OL3. Indented points are components of TMMs less similar among workgroup members than non-indented points.

| Taskwork | Teamwork |
|---|---|
| • Increasing the Liveliness of the central station area, i.e. making it more friendly, nicer, and more pleasant<br>• Focus on visitors of the central station area and employees of organisations in the area alike<br>• Executing (short-term) projects that increase the Liveliness of the area | • A lot of brainstorming for creative idea generation<br>• Employing external parties to actually execute projects<br>• Subgroups responsible for executing (short-term/small) projects, own choice and therefore (hopefully) ownership toward those projects<br>  ○ Reflection on the solution-creation process of the workgroup |
| **Similar Comments by Workgroup Members** | |
| • Liveliness is what the workgroup aims for but it is difficult to pinpoint/define<br>• 'Loose sand', i.e. loosely connected projects that might not necessarily require the existence of a separate workgroup | • Difficulty in setting priorities for the workgroup<br>• Less commitment among members as external support helps executing projects<br>• Search for bigger project to execute as a group, but unsuccessful |
| **Notes on Degree of Similarity in TMMs** | |
| Disagreement on what Liveliness is exactly, e.g. if art is something to be added to projects or if the focus should be on the 'green' aspect of Liveliness only<br><br>Slight disagreement on the exact boundaries of the area in which the workgroup operates | Disagreement on whether more people are needed, or the current members of the workgroup should commit more (time) to the workgroup<br><br>Miscommunication within the workgroup around executing tasks<br><br>Disagreement on whether workgroup members should solely focus on their projects and updating their fellow workgroup members instead of actively working together as a group |

# Appendix D – Team Mental Model Workgroup Mobility

This group-level team mental model comprises both taskwork and teamwork, which are here operationalised as what the goals of the workgroup are (according to the workgroup members) and how they are to be achieved, respectively. It is based on the similarities found in team mental models from workgroup members. As stated in Section 3.2., qualitative analysis of interviews and meeting observations allowed for elicitation of the team mental models (Mohammed et al., 2010). In the case of the workgroup Mobility this included interviews with M1 and U as well as meeting observations OM1 and OM2. Indented points are components of TMMs less similar among workgroup members than non-indented points.

<table>
<tr><th>Taskwork</th><th>Teamwork</th></tr>
<tr><td>
<ul>
<li>Reducing $CO_2$ emissions from employee Mobility
<ul>
<li>To zero by 2035 (easier to understand and achieve)</li>
<li>Only consider emissions from participating organisations, not the whole general area</li>
<li>Focus on visitors (only during meetings)</li>
<li>Not measuring emissions</li>
</ul></li>
<li>Increasing safety of the area</li>
<li>Short-term challenges for no-emissions Mobility</li>
<li>Sharing of electric cars and (electric) bicycles
<ul>
<li>Less focus on public transport (than previously)</li>
</ul></li>
<li>Generating support from home-organisations for workgroup actions and plans</li>
</ul>
</td><td>
<ul>
<li>Every four weeks workgroup meetings with agenda made by M1 or U</li>
<li>Executing (short-term) actions and establishing (long-term) programmes regarding no-emissions Mobility</li>
<li>Discussion to create solutions to large problems rather than only sharing knowledge, benefits from diversity in perspectives</li>
<li>Brainstorm during meetings to generate new ideas for projects and programmes</li>
<li>Tasks are divided among small subgroups with U as ‘linking pin’
<ul>
<li>‘Ideal team per tasks’</li>
<li>Continuity in solution-creation process</li>
</ul></li>
</ul>
</td></tr>
<tr><th colspan="2">Similar Comments by Workgroup Members</th></tr>
<tr><td>
<ul>
<li>Goals affect business model and terms of employment (aiming to avoid this)</li>
<li>Decision-making regarding Mobility in home-organisations is complex</li>
</ul>
</td><td>
<ul>
<li>Communication toward home-organisations should be improved (mostly emphasised by M1 though)</li>
</ul>
</td></tr>
<tr><th colspan="2">Notes on Degree of Similarity in TMMs</th></tr>
<tr><td>Explicit agreement among workgroup members on goals of the workgroup during general participant meetings as well as workgroup meetings<br><br>Workgroup members often refer to the year plans and annual reflection reports to ensure they agree during discussions on the goal of the workgroup</td><td>General agreement on solution-creation process during workgroup meetings with occasional proactive behaviour from some members (most notably M1) to ensure U does not become solely responsible for executing tasks<br><br>Different perception of U’s role (slightly) as U tends to take responsibility for many tasks (arguing they are being paid rather than volunteering) while others are also willing to take on tasks and project responsibility</td></tr>
</table>

# Appendix E – Team Mental Model Workgroup Circularity

This group-level team mental model comprises both taskwork and teamwork, which are here operationalised as what the goals of the workgroup are (according to the workgroup members) and how they are to be achieved, respectively. It is based on the similarities found in team mental models from workgroup members. As stated in Section 3.2., qualitative analysis of interviews and meeting observations allowed for elicitation of the team mental models (Mohammed et al., 2010). In the case of the workgroup Circularity this included interviews with C1, C2, C3, and U as well as meeting observations OC1 and OC2. Indented points are components of TMMs less similar among workgroup members than non-indented points.

<table>
<tr><th>Taskwork</th><th>Teamwork</th></tr>
<tr><td>
<ul>
<li>Reducing general waste from organisations participating in the GBCU
<ul><li>Create value from waste</li></ul></li>
<li>‘Ultimate goal’ to have no general waste in the central station area of Utrecht
<ul><li>Contributing to Circularity of the central station area</li></ul></li>
<li>Reduce the number of trucks entering the city
<ul><li>Create a hub for goods transport outside the city</li></ul></li>
<li>Sharing knowledge and building a network for waste management and goods transport</li>
</ul>
</td><td>
<ul>
<li>Workgroup meetings every six weeks</li>
<li>Core team writes year plan by which the group operates throughout the year</li>
<li>Core team steers other workgroup members for executing tasks, which are mainly data collection and knowledge sharing</li>
<li>Support from U with relevant expertise and networks regarding goods transport</li>
<li>Spontaneous project creation by using network of workgroup members</li>
<li>Fast execution of short-term projects by core team with external support</li>
</ul>
</td></tr>
<tr><th colspan="2">Similar Comments by Workgroup Members</th></tr>
<tr><td>
<ul>
<li>Too many parties and incentives for reducing general waste in public areas</li>
<li>Emphasis on knowledge sharing for sustainability-related topics</li>
</ul>
</td><td>
<ul>
<li>Slightly chaotic workgroup functioning due to voluntary nature of participation in the workgroup</li>
</ul>
</td></tr>
<tr><th colspan="2">Notes on Degree of Similarity in TMMs</th></tr>
<tr><td>Explicit referencing of the year plan when elaborating on workgroup goals to show agreement with written goals among workgroup members<br><br>Some members indicated a shift to the goods transport project as main topic of the workgroup (workgroup split up into two workgroups later)</td><td>Some members indicated solutions for Circularity challenges are more easily created than for other sustainability challenges, e.g. Mobility challenges</td></tr>
</table>

# Appendix F – Comparison with Greer (2017) on Effective Inter-Organisational Collaboration

In their dissertation on inter-organisational collaboration, Greer (2017) identified two types of elements essential for successful collaboration: initial and emergent elements. This distinction shows similarities with the emergent properties of teams in team diversity literature (e.g. van Knippenberg & Mell, 2016). Emergent elements or properties are the result of processes within a group and are defined in reference to the group itself and its initial elements (Greer, 2017; Van Knippenberg & Mell, 2016). According to Greer (2017), initial elements for successful collaboration are committed members, time, and resources. These are identical to some of the concepts identified in this thesis as influencing the development of TMMs. From these initial elements and initial communication, the group develops emergent elements: (emergent) communication, trust, shared goal, defined process, and collective identity (Greer, 2017). As the group continues working together, adjustments are made to eventually come to a successful collaboration. This process is shown in the figure below.

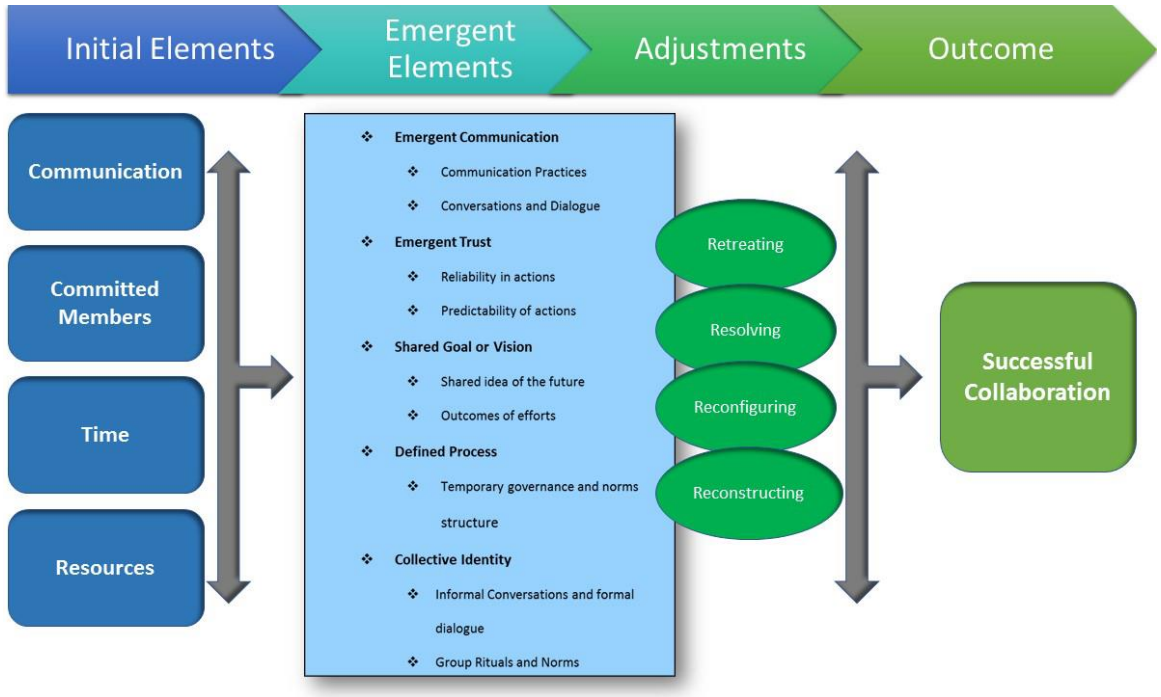


*Figure 19: The model for successful collaboration based on the interactions of all elements within the socially sustained boundary (from Greer [2017])*

According to Greer (2017), effective collaboration starts with committed members. After testing the above model, Greer (2017) also concluded that there were high correlations between 'committed members' and the elements of time and resources. As discussed in the previous chapter, commitment itself has many precedents and committed members are created rather than found. Intrinsic motivations, home-organisational culture, and incentives are all important factors to the creation of highly committed members, i.e. champions. Rather than committed members being initial elements, the current study showed that even more primary elements, such as motivation and time, influence member commitment. The importance of committed members for successful collaboration is evident in both the current study and in Greer (2017). Greer (2017) found that committed members were deemed vital to the success of a collaboration. Others (e.g. Hietajärvi & Aaltonen, 2018) concluded similarly in a range of collaboration settings. The importance of committed members is again confirmed in the present study, indicating that member commitment is one of the main components necessary for successful collaboration in both paid and (more) voluntary collaboration.

Emergent communication and trust arise throughout a group working together as members communicate with each other and learn from each other (Greer, 2017). These elements could also be seen in the present study at the workgroup-level (in 'workgroup content') and at the level of the collaboration organisation. Discussion in the collaboration organisation and reflection in workgroup meetings displayed the same components as Greer's (2017) communication and trust. Constructive communication is the same as what Van Knippenberg and colleagues (Hoever et al., 2012; Van Knippenberg et al., 2004, 2013; Van Knippenberg & Mell, 2016) termed 'information elaboration'. This process, discussed in Chapter 2, entails group members constructively building on their individual perspectives and using this diversity in perspectives, knowledge, and resources to create trust between members and to effectively work together to create solutions to challenges. These elements are thus predecessors to the creation of a 'shared goal' and a 'defined process' as well as continuous influences on these other elements (Greer, 2017; Guillaume et al., 2015; Harrison et al., 2003; Marks et al., 2001; Van Knippenberg et al., 2004).

The defined process of Greer (2017) is not simply the established way in which group members work together to achieve their goals. Greer (2017) stated that after communication among members has started and rituals and norms have begun to be created, "collective identity formation [is] solidified by the creation of the shared process and goals" (p. 62). The establishment of a defined process and a shared goal is thus the result of agreement among group members on norms and expectations around working together (Greer, 2017). The defined process in turn also influences these norms and expectations. In other words, it has a bidirectional relationship with the TMMs of the group. It is therefore the same or at least similar as what this thesis termed the solution-creation process. The current study and Greer (2017) thus agree on the importance of similar TMMs for successful collaboration as well as the complex relationship it has with the solution-creation process.

# Master Thesis
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# Sustainable Business and Innovation

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