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The Impact of Negative Goal Interdependence on Knowledge Sharing and Shared Mental Models in Hybrid Team Environments and the Moderating Role of Trustworthiness

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Abstract

Purpose. The purpose of this study is to examine the impact of perceived trustworthiness and negative goal interdependence on knowledge sharing and SMMs in hybrid teams. This aims to provide insights into optimizing team dynamics and management practices in hybrid team environments.

Methodology. Through a quantitative study among 32 teams across different industries, the mediating relationship of negative goal interdependence and shared mental models through knowledge sharing was examined. Additionally, the moderating role of perceived team members' trustworthiness on the direct and indirect relationship was analyzed.

Findings. The findings indicate that neither negative goal interdependence, knowledge sharing, nor perceived team members' trustworthiness significantly impacts the development of SMMs in hybrid team environments. The hypotheses, which focused on these relationships, are not supported. The lack of significant results suggests that other factors might play a more critical role in influencing SMMs in hybrid team settings.

Implications. This study gives theoretical insights into the relationship between negative goal interdependence and SMMs with knowledge sharing as a mediator, and perceived team members' trustworthiness as a moderator. Practically, it includes implications to organizations, team leaders, and members on how to manage hybrid teamwork more effectively.

Keywords: Shared Mental Models, Negative Goal Interdependence, Knowledge Sharing, Knowledge Hiding, Perceived Team Members Trustworthiness, Hybrid Team Setting.

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1. Introduction

Due to globalization, technological advancements, and the need for flexible work arrangements, working in a hybrid team setting has emerged as the modern approach to work (Chinowsky & Roja, 2002). Hybrid teams can be defined as a workgroup composed of team members who work remotely or on-site in a physical office location. This blend of remote and in-office results in a mix of virtual and face-to-face interactions, aiming to leverage the advantages of both work environments. These teams play a vital role in today`s fast-moving and globalized business environment since they facilitate effectively working together across geographical boundaries and enable increased flexibility and responsiveness accommodating a variety of employee needs and preferences (Zaccaro, 2003). Additionally, they offer several benefits to organizations such as giving access to a diverse talent pool and saving costs. Hybrid teams have several key characteristics that differentiate them from traditional teams (Chinowsky & Roja, 2002). The main characteristic is the reliance on Information and Communication Technology (ICT) tools. However, it is emphasized that "… communication technology restrictions also create unexpected challenges during the life of the team" (Abbasnejad & Moud, 2012, p.15). By communicating through ICT tools, global virtual teams lack the nonverbal cues that are present in face-to-face interactions such as body language, facial expression, and eye contact. Furthermore, they face communication delays due to different locations, leading to less real-time interactions and informal interactions. Due to the absence of nonverbal cues and real-time interactions, there is lower information richness in hybrid teams, which refers to the depth and width of information that can be conveyed through a communication channel, increasing the risk of misunderstandings, misinterpretations, and difficulties in conveying more complex ideas (Maynard et al., 2018). Therefore, in a hybrid team environment, adequate information, knowledge sharing, and communication become exceptionally important. Particularly considering the challenges of communicating through ICT tools, the literature highlights the importance of developing a shared understanding about crucial aspects of work within these teams. It ensures that team members are aligned and therefore serves as the foundation for effective collaboration and increased team performance (Maynard et al., 2018).

In academic literature, this shared understanding among team members is commonly referred to as "shared mental models" (SMMs) (Mohammed et al., 2010; Santos et al., 2015).

SMMs have been identified as a critical success factor within teams enabling effective communication, coordination, decision-making, and performance (Mohammed et al., 2010; Santos et al., 2015). Furthermore, the literature emphasizes that in a hybrid team setting, where members are geographically dispersed and rely on a combination of face-to-face and virtual interactions, the importance of SMMs becomes even more pronounced (Li et al., 2018). SMMs enable a common understanding of goals and objectives within the team, despite working geographically dispersed, and therefore can mitigate the challenges faced in a virtual team setting (Mohammed et al., 2010; Santos et al., 2015). However, it is important to emphasize that this research focus lies on perceived SMMs within the team (PSMMs). While SMMs refer to the actual understandings within a team, PSMMs are about the individual team members' perceptions about the extent to which the team shares this common understanding or mental model.

However, the main limitation in theory is that despite the high importance of SMM in hybrid team settings it may be more difficult to develop SMM within hybrid teams due to several challenges. Existing research has yet not provided clear insights on how to optimize the development of perceived SMMs in this specific context. First, one reason is the geographical distance of team members and the challenges of a virtual team setting such as missing face-to-face contact, and less real-time interactions that further complicate establishing SMMs within the team. However, the other main challenge identified is negative goal interdependence. Negative goal interdependence happens when team members perceive their goals and outcomes to be in conflict, which creates an atmosphere of competition and self-interest (Johnson & Johnson, 1991). This concept is grounded in the social interdependence theory by Johnson & Johnson, (1991), which suggests that when individuals share common goals, their outcomes are affected by the actions of others. Unlike positive goal interdependence, where goals are seen as compatible, negative goal interdependence involves the perception that the own success comes at the expense of others, posing a significant challenge in team dynamics (Johnson & Johnson, 1991). This study suggests that when team members perceive negative goal interdependence, team members do not share their knowledge and start engaging in knowledge-hiding behaviors. This can be seen as a major problem since knowledge sharing has been identified as a fundamental driver for developing SMM within teams (Li et al., 2018). This problem is further exacerbated in a hybrid team setting, where factors such as limited visibility, geographical dispersion, reduced social cues, and lack of informal information make it even easier for individuals to withhold knowledge (Staples & Webster,

2008). Literature defines knowledge sharing as the exchange of crucial information, experiences, and expertise within an organization, facilitating a common understanding of tasks, goals, and expectations (Argote & Ingram, 2000). In contrast, knowledge hiding encompasses behaviors such as avoiding sharing relevant information, providing incomplete or misleading information, or actively avoiding discussions related to one's expertise. Literature identified knowledge hiding as a major challenge since it prevents access to critical knowledge and information which in turn, hinders the development of SMM (Sergeeva & Andreeva, 2016). However, one concept that emerges to address the problem of negative goal interdependence, is the perceived trustworthiness of team members.

The perceived trustworthiness of team members has been identified as a potential solution in mitigating the negative effects of negative goal interdependence on knowledge-sharing (Lee et al., 2010). Current research argues for the positive impact of perceived trustworthiness on knowledge-sharing behaviors (Breuer et al., 2019; Zand,1972). It has been identified that when someone is perceived as trustworthy, individuals are more willing to share their knowledge with that person (Breuer et al., 2019). Therefore, this thesis aims to uncover how the perceived trustworthiness of team members can mitigate the negative impact of negative goal interdependence on knowledge sharing and with that promote a conducive knowledge-sharing environment that fosters SMMs.

The primary research objective of the thesis is to investigate whether negative goal interdependence influences knowledge sharing and perceived SMMs in a hybrid team environment. Furthermore, this research aims to examine if the perceived trustworthiness among team members can lead to increased knowledge sharing even in the presence of negative goal interdependence, thereby mitigating the negative impact of negative goal interdependence, and supporting the development of SMMs. This study makes theoretical contributions to the understanding of hybrid teams, particularly in the context of negative goal interdependence, perceived Shared Mental Models (SMMs), and the role of perceived trustworthiness within teams. The results of this thesis will broaden literary knowledge, but it will also provide practical insights for effective team management in modern work environments.

2. Theory and Hypotheses

2.1 The Negative effect of Negative Goal Interdependence on SMM

SMMs have been identified as a critical team success factor and can be defined as having "…a common understanding among the team members about relevant task and team aspects of their work" (Santos et al., 2015, p.645). Current research clearly emphasizes the relationship between SMMs and increased team effectiveness and performance (Mohammed et al., 2010; Santos et al., 2015). SMMs enable team members to gain a deeper understanding of the task, team dynamics, and the situation, leading to an improved understanding within the team (Johnson et al., 2007). They foster a common understanding of information (description), facilitate the expression of future anticipations (prediction), and encourage the development of similar explanations for a given situation (explanation) (Cannon-Bowers et al.,1993). Having this shared understanding within the team is crucial since it ensures that team members are aligned about critical aspects of work (Mohammed et al., 2010; Santos et al., 2015). However, this research primarily emphasizes the concept of perceived SMMs (PSMMs). While SMMs refer to the actual understandings within a team, PSMMs are about the individual team members' perceptions about the extent to which the team shares this common understanding or mental model.

The literature distinguishes between five different types of mental models. According to Cannon-Bowers et al. (1993), one can differentiate between an equipment model, a task model, a team interaction model, and a team model. At a later stage, the temporal model was added (Mohammed et al., 2015; Santos et al., 2015). However, recently, to measure perceived SMMs, Rensburg et al. (2022) refined and renamed the SMMs to equipment, execution, interaction, composition, and temporal models. The equipment model refers to the shared understanding of the tools and resources required to accomplish the given task. Next, the execution model involves the understanding of the steps, actions, and dependencies of the sequence of actions that are needed to carry out the task efficiently. The interaction model refers to the norms and rules on how to communicate, share information, and interact with each other. In contrast, the composition model is about the awareness of each other's knowledge, abilities, skills, strengths, and weaknesses.

Lastly, the temporal model focuses on the temporal aspects of the task, including deadline, coordination, sequencing, timing, and any temporal constraints or dependencies that may influence the execution of the task (Rensburg et al., 2022). Research emphasizes "… it is critical that team members are "on the same page" on which tools or equipment to use, what tasks to perform, with whom they need to interact and coordinate and how to do so, and when the work has to be accomplished" (Rensburg et al., 2022, p.3). Having a shared understanding of these aspects within the team will make team processes more efficient and lead to higher team performance (Mohammed et al., 2010; Santos et al., 2015).

The literature emphasizes the significance of perceived SMMs especially in hybrid team environments, highlighting how geographical dispersion and reliance on virtual interactions amplify the need for a common understanding (Mohammed et al., 2010). However, the development of SMMs faces considerable obstacles in hybrid team environments (Li et al., 2018). Kanse et al. (2023) discuss the challenges unique to these settings, which can significantly hinder the formation of SMM. In traditional team settings, team members benefit from spontaneous interactions and face-to-face contact, which are largely absent in virtual teams. This lack of physical presence and reduced communication richness often leads to a loss of social cues, a direct challenge to the establishment of perceived SMMs (Schmidtke & Cummings, 2017; Maynard & Gilson, 2015).Additionally, current research identified team characteristics, which further exacerbate the complexity of developing perceived SMMs, including negative goal interdependence (Mohammed et al., 2010). In this study, it is argued that negative goal interdependence can hinder the formation of perceived SMM in a hybrid work setting. With negative goal interdependence, team members perceive a negative relation between the attainment of one's own and the others' team members' goals, and goals are seen as mutually incompatible: "If one party swims, the others must sink" (Janssen et al., 1999, p.118). This perception of conflicting goals can create a competitive and suspicious environment within the team, which makes the development of perceived SMM more challenging (Johnson & Johnson, 1989; Tjosvold, 1988). The main challenge identified is that when team members perceive conflicting goals, it limits the team members' ability to share, exchange, and process relevant information and knowledge (Janssen et al., 1999). This is perceived as a major challenge since information and knowledge sharing are critical components in forming perceived SMM within the team (Maynard and Gilson, 2014, Deutsch, 1949). Furthermore, it is emphasized that when perceiving conflicting goals, team members develop a competitive mindset.

Team members perceive that their success comes at the expense of others, which represents a significant issue (Janssen et al., 1999). Team members become suspicious about others' intentions and are less motivated to engage in collaborative efforts (Tjosvold, 1988; Zand's, 1972). There is a reduced willingness of team members to collaborate and communicate with each other (Thompson, 1967). In a hybrid team setting, these factors are already perceived as a main challenge, however, negative interdependence may further intensify the problem, hindering the development of SMM (Maynard & Gilson, 2014; Kanse et al., 2023). Team members start prioritizing their own success over the team's success. Instead of working towards collaborative goals, they focus on their individual goals instead (Johnson & Johnson, 1989; Tjosvold, 1988). Consequently, there is no longer a shared understanding of crucial aspects of work resulting in misaligned mental models (De Dreu & Weingart, 2003).

Considering the implications of negative goal interdependence, particularly within a hybrid team environment, and while taking into account what is important for effectively developing SMMs, this thesis proposes that when team members perceive conflicting goals, they are less likely to develop a common understanding, leading to lower levels of shared mental models within the team. Therefore, I hypothesize:

Hypothesis 1. Negative Goal Interdependence has a negative influence on SMM in a hybrid team setting.

2.2 Mediation of Knowledge Sharing on the Relationship between Negative Goal Interdependence and SMMs

This study argues that Negative Goal Interdependence, negatively impacts knowledge sharing among team members, which in turn hinders the development of SMMs. This issue is perceived as a main challenge since it hinders the access and exchange of critical knowledge and information, which is crucial for developing perceived SMMs (Sergeeva & Andreeva, 2015). This challenge is particularly exacerbated in the hybrid team environment, where team members, due to factors such as limited visibility, lack of informal information, and reliance on virtual communication technologies, can more easily withhold their knowledge (Kanse et al., 2023). Withholding knowledge encompasses behaviors such as avoiding sharing relevant

information, providing incomplete or misleading information, or actively avoiding discussions related to one's expertise (Sergeeva & Andreeva, 2015). Research emphasizes that in settings with high outcome interdependence, knowledge sharing becomes even more crucial since team members highly depend on each other (Jiang et al., 2015). However, another study by Kanse et al. (2023) highlighted that virtual teams perform best when they are less interdependent regarding their access to crucial resources, including skills, information, and knowledge. It is emphasized that team performance declines due to being dependent on others for access to information and knowledge as a critical resource, which makes access to these resources essential but even more challenging in virtual teams (Kanse et al., 2023; Hinds & Bailey, 2000). According to the Media Richness Theory, for tasks, where a lot of individually held information needs to be shared, low communication media richness, which applies in virtual teamwork, will negatively impact performance (Kanse et al., 2023). Additionally, it is argued that when team members perceive a misalignment between an individual's goals and the organization's objectives, team members might not see the value in sharing knowledge. Conflicting goals, diminish the beneficial effects of motivation on knowledge sharing, leading to the reduced willingness of team members to share and integrate knowledge effectively (Janz et al., 1997). Team members perceive sharing information as harming their own goals while benefiting others. The literature states “When employees feel constrained to compete, it may lead to hide knowledge to maximize their competitive advantage” (Sergeeva & Andreeva, 2015, p.13) According to the social exchange theory, individuals base their actions on an evaluation of their perceived benefits and costs. While perceived benefits are positively associated with knowledge sharing, perceived costs decrease knowledge sharing (Wang & Noe, 2010). Furthermore, team members become critical regarding the intentions, how the information will be used, and whether sharing intellectual property will be valued and receive appropriate credit (Tjosvold, 1988; Zand’s, 1972). Lin (2006) proposes that goal interdependence impacts knowledge sharing through instrumental and expressive ties. While instrumental ties focus on the exchange of task-related information, expressive ties relate to the personal aspects. The study suggests that in team settings, with high negative goal interdependence, these ties may be weakened, reducing knowledge sharing within the team. This weakening occurs because conflicting goals can lead to competition, mistrust, and reduced willingness to cooperate.

In turn, the reduction in knowledge sharing hinders the development of perceived SMMs with the team since knowledge sharing is seen as a critical component in the development of perceived SMMs (Johnson et al., 2007; Li et al., 2018). Especially, when facing physical distance, being aligned within the team about critical aspects of work, requires adequate information and knowledge by all team members (Maynard and Gilson, 2014, Deutsch, 1949). It ensures that every team member has the information necessary to perform their respective tasks. In contrast, withholding knowledge can result in diverse interpretations and increase the risk of misunderstandings. Team members potentially develop different understandings of crucial aspects of work, leading to misalignment and inefficiency within the team. Facing these misalignments in understanding, interpretations, and expectations of essential aspects, not only hinder the development of SMMs but also cause detrimental consequences for the team, especially in the long term (De Dreu & Weingart, 2003).

This shows how negative goal interdependence negatively impacts knowledge sharing among team members, particularly in hybrid team environments, which hinders the development of SMMs. Therefore, the study proposes that:

Hypothesis 2. *Knowledge sharing mediates the relationship between Negative Goal Interdependence and the development of Shared Mental Models (SMM) in hybrid team environments.*

2.3 The Moderating Role of Perceived Trustworthiness

This research proposes that the perceived trustworthiness of team members can potentially mitigate the negative impact of interdependence on knowledge-sharing and with that foster knowledge-sharing.

Trustworthiness is defined as the assessment of certain attributes in the trustee that determine how much trust the other party has for the trustee (Mayer et al., 1995). Due to “today's rapid reorganizations, diffusion of responsibility, and collaborative team-based work style” (Robbins & Judge, 2015, p. 388), these trusting relationships are essential as never before.

Breuer et al. (2019) define trust within the team as "… the shared willingness of the team members to be vulnerable to the actions of the other team members based on the shared expectation that the other team members will perform particular actions that are important to the team, irrespective of the ability to monitor or control the other team members" (Breuer,2019, p.3). Especially for teams, who communicate via technology and face geographical distance, trust gains even more importance (Guinalíu & Jordán, 2016; Morrison-Smith & Ruiz, 2020; Greenberg et al., 2007). Literature states "Trust is important for any team to function and excel, but its importance for virtual teams is even more critical" (Cascio & Shurygailo, 2003, p.373). Mayer, Davis, and Schoorman (1995) identified integrity, benevolence, and ability as the key characteristics that determine a person's trustworthiness, which was also confirmed as being applicable in virtual teams. In practice, these key characteristics can be found in open communication, fairness, and good intentions (Savolainen, 2013). Integrity refers to "walk your talk." To build trust in someone, consistency between what is said and what is done by sticking to values and standards is required. Furthermore, they define benevolence as "the extent to which a trustee is believed to want to do good to the trustor, aside from an egoistic profit motive" (Mayer et al. 1995 p. 118). This relates to being interested in the well-being of others, even when it is not directly in their interest in the first place. One study identified predictability and transparency as further main categories of assessing someone's trustworthiness within the team (Breuer et al., 2019). However, research emphasizes the complexity of developing trust within the team. In a team setting, the assessment of a person's trustworthiness is based on more complex information, such as how team members interact with others or how information is being shared. However, trustworthiness has been identified as a crucial element in various team-related processes, including effective knowledge sharing (Breuer et al.,2019).

Trustworthiness has been identified as a vital element for effective knowledge sharing within the team (Breuer et al.,2019). This study argues that when team members perceive each other as highly trustworthy, team members may still share knowledge despite perceiving conflicting goals. The literature emphasizes that trust "creates emotional openness and improves the way how team members listen to each other, absorb others knowledge, and accept influence and share relevant knowledge" (Lee et al., 2010, p.478). Another study by Zand's (1972) identified that trust positively impacts "the accuracy, relevance, and completeness of information and knowledge shared, as well as the acceptance of others' knowledge and influence." (Zand,1972, p.230).

Furthermore, it is highlighted that teams with high trust experience more openness, share more relevant information, and create more creative and innovative solutions. Team members feel more comfortable sharing their thoughts and ideas without fear of judgment. This atmosphere of acceptance encourages more in-depth discussions and a richer exchange of perspectives, leading to more innovative and effective solutions (Lee et al., 2010, p.478). Additionally, with a high level of trust, one gains access to the knowledge and creative thinking of team members. When team members feel psychologically safe, treated fair, and listened to, they will share a higher degree of information. Moreover, trusting teams are more effective since employees support each other and are more willing to put in extra effort. However, a recent study suggests that one should distinguish between the willingness to disclose personal or work-related information (disclosure-based trust) and the willingness to depend on another (reliance-based trust). A team member might share information and personal details but would not trust this person to complete a task for them (Lee et al.,2010). All of this shows how the perceived trustworthiness of a team member can lead to increased knowledge sharing and with that potentially can mitigate the negative impact of interdependence, fostering an SMM. However, in contrast, for low trustworthiness, the negative impact of goal interdependence on knowledge sharing will be stronger. Team members become critical regarding the intentions of other team members, such as how the information will be used, and whether sharing intellectual property will receive appropriate credit (Robbins & Judge, 2015). Consequently, knowledge sharing declines. This can further exacerbate the consequences of negative goal interdependence leading to a competitive environment of suspicion and with that hinder the development of effective SMMs within the team.

Therefore, the study proposes that the level of trustworthiness among team members influences how negative goal interdependence affects knowledge sharing. When trustworthiness is high, the negative impact is weakened, with knowledge sharing being more likely to occur despite conflicting goals. In contrast, with low perceived team members' trustworthiness, the negative impact is intensified, and knowledge sharing becomes even more challenging in the presence of conflicting goals. Therefore, hypothesis 3 is as follows:

Hypothesis 3. Perceived team members' trustworthiness moderates the relationship between Negative Goal Interdependence and Knowledge sharing, such that under high (vs. low) team members' trustworthiness the effect will be weaker (vs. stronger).

2.4 Moderated Mediation Role of Perceived Trustworthiness

Negative goal interdependence negatively impacts knowledge sharing among team members and thereby hinders the development of perceived SMMs. However, the perceived trustworthiness among team members influences how negative goal interdependence affects knowledge sharing. For high trustworthiness, team members still share knowledge despite conflicting goals. In contrast, when trustworthiness is low, the negative impact is intensified, and knowledge sharing becomes even more challenging in the presence of conflicting goals. Therefore, in environments where trustworthiness is perceived as high, the detrimental effects of negative goal interdependence on knowledge sharing, and thus on SMMs, are likely to be mitigated. Consequently, the study hypothesizes that perceived trustworthiness moderates the indirect relationship between negative goal interdependence and SMMs through knowledge sharing, indicating that with high trustworthiness, the detrimental impact of negative goal interdependence is expected to be weaker. Therefore, hypothesis 4 is as follows:

Hypothesis 4. Perceived team members' trustworthiness moderates the indirect relationship between negative goal interdependence and SMMs through knowledge sharing, such that under high (vs. low) perceived team members' trustworthiness the effect will be weaker (vs. stronger).

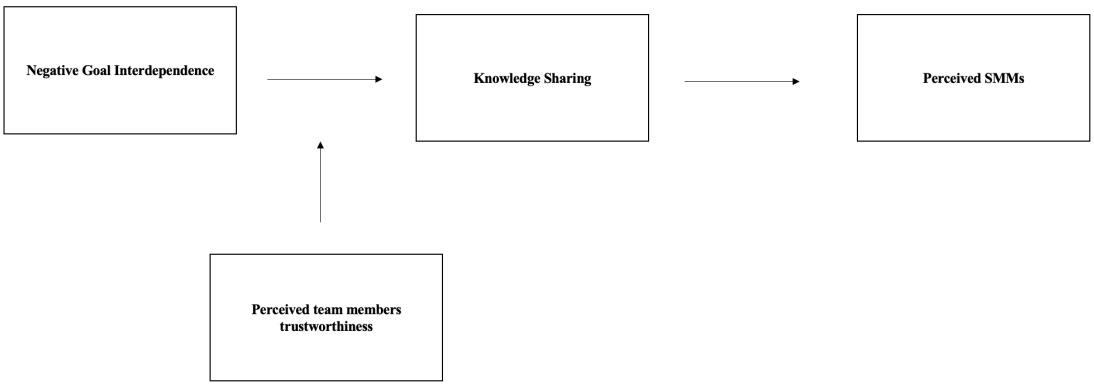

Figure 1. Conceptual Model

3. Methods

3.1 Sample

In this study, a total of 32 teams (119 individuals) participated. The average team size was 5.672 members per team. The average age of respondents was approximately 40.4 years (*SD* = 12.27). Regarding gender distribution, there is a balanced representation with 50.4% male and 47.9% female participants. A small proportion of respondents (1.7%) preferred not to disclose their gender. The educational backgrounds of respondents varied widely, with a significant amount holding graduate degrees (37.6%) and undergraduate degrees (35.9%).In addition, 10.3% of respondents had a college or technical qualification, 7.7% had completed secondary school, and 7.7% had doctorate degrees. A very small percentage (0.85%) reported having no formal qualifications. In terms of employment status, a large majority of the participants were full-time employed (75.6%), while 21.0% were part-time employed. A smaller group (3.4%) indicated other forms of employment status. The teams were involved in various functions, with Operations (22.69%), Other (19.33%), and Marketing (14.29%) being the most common. The average team tenure was approximately 16.41 months (*SD* = 34.97). Participants reported spending an average of 55.19% of their time working online (*SD* = 28.05%) and 44.81% of their time working face-to-face (SD = 28.05%). The team members orginally come from diverse countries, primarily Germany (88.14%), followed by the United States of America (4.24%) and others including Serbia, South Korea, Philippines, Mexico, Italy, and Hong Kong.

3.2 Procedure

For this study, quantitative data was collected via an online questionnaire which was developed and published on Qualtrics. The data collection period lasted for five weeks. The goal was to get a minimum participation of 30 teams. To utilize a team, a minimum of three team members, including the leader had to participate. Additionally, it was important to have a team response rate of at least 50%. However, still, the aim was to get as many responses per team as possible. Another requirement was that the team operates in a hybrid team setting, which was ensured with a specific question in the survey. The questionnaire took about 10 minutes. The respondents primarily consisted of contacts from prior work experience and family and friends employed in various companies.

They further shared it with co-workers or other contacts to ensure the maximum number of responses. The procedure was the following. First, a factsheet was shared, which included information about the research purpose, the requirements, information about the procedure if they decide to participate, and a general overview of the topics that will be covered within the survey. When they decided to participate as a team, an email with the survey link and team code was sent to one team member, who shared it with the other team members. All team members had to use the same team code. Since teams are being studied the answers need to be analyzed on the team level and not the individual responses. Furthermore, the team was requested to provide some additional information about their main tasks, and department. Beginning of the survey respondents were provided with information about the research purpose and confidentiality of the data. To participate in the survey, they were required to grant their consent. Afterwards, respondents were asked for their team code and then, the survey questions started. The questionnaire consisted of statements measuring perceived SMM, negative goal interdependence, knowledge sharing and hiding and perceived team members trustworthiness. At the end of the survey, socio-demographic questions were asked such as age, gender, nationality, employment status, team tenure, team familiarity, and team interaction.

3.3 Measures

Perceived shared mental models. To measure perceived SMMs, the 5-PSMMS measure by Rensburg et al. (2022) was used. The 5-PSMMS is comprised of 20 items, which are distributed across the five distinct dimensions of SMMs, including equipment, execution, interaction, composition, and temporal models. All items start with "Team members have a similar understanding…“ An example of the 5-PSMMS measure is: “Team members have a similar understanding about sharing information with each other” (Interaction). The complete overview of questions can be found in appendix. Participants were asked to indicate their level of agreement with the statements on a 7-point scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree. Moreover, Cronbach’s value is within the acceptance ratio ($\alpha = .89$).

Negative goal Interdependence. To measure negative goal interdependence, the four-item scale adapted from Janssen et al. (1999) was used. They measured positive interdependence between team members with the following four statements. "Characteristic for our team was that (a) goal attainment for one team member facilitated goal attainment for others; (b) success for one team member implied success for others; (c) benefits for one team member involved benefits for others; and (d) gain for one team member meant gain for others". To measure negative goal interdependence, the statements were adapted to: “Goal attainment for one team member prevents goal attainment for the other team members”, “Success for one team member implies failure for the other team members”, “Benefits for one team member involves damages for the other team members”, “Gain for one team member means loss for the other team members.” Participants were asked to indicate their level of agreement with the statements on a 7-point scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree. Moreover, Cronbach’s value is within the acceptance ratio ($\alpha = 0.85$).

Knowledge Sharing. To measure the extent to which team members share their special knowledge within the team, the seven-item scale by Chuang et al. (2013) was used. They adapted four items from Faraj and Sproull (2000) and they added three items. All items used “team” as the referent. An example of the scale is: “If a member in our team has some special knowledge about how to perform the team task, he/ she will tell other members about it.” The complete overview of questions per concept can be found in appendix. However, to ensure consistency, the following item from the "Knowledge Sharing" scale had to be reverse-coded: "There is virtually no exchange of information, knowledge, or sharing of skills among members of the team.". This item is phrased negatively concerning the construct of knowledge sharing. A "Strongly agree" response to this item indicates a lower level of knowledge sharing, while for other items, "Strongly agree" indicates a higher level of knowledge sharing. Participants were asked to indicate their level of agreement with the statements on a 7-point scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree. Moreover, Cronbach’s value is within the acceptance ratio ($\alpha = .78$).

Perceived team members' trustworthiness. To measure the perceived trustworthiness of team members, the scale by Costa and Anderson (2011) was used. The scale is comprised of 21 items, which are distributed across the propensity to trust, perceived trustworthiness, cooperative behaviors, and monitoring behaviors.

To measure the perceived trustworthiness of team members, only the statements referring to that dimension were used. Statements were: “In this team people can rely on each other”, “We have complete confidence in each other's ability to perform tasks”, and “In this team, people will keep their word.” One statement was “Some people in this team often try to get out of previous commitments.” This one had to be recoded since an agreement with this statement suggests a lack of commitment, which is generally viewed as a negative behavior in the context of teamwork. The complete overview of questions per concept can be found in the appendix. Moreover, Cronbach’s value is within the acceptance ratio ($\alpha = .98$).

Control variables. Several control variables were included to control for their possible confounding impacts on the other effect sizes and to eliminate their potential effect on team outcomes (Van der Vegt & Janssen, 2003). This study controls for team size, team tenure, team virtuality, knowledge hiding, and age. This aligns with previous research methodologies applied in similar studies (Santos et al., 2015b; Van der Vegt & Janssen, 2003). Team size was included because it influences the ability of a team to create mental models (Santos et al., 2015b). Knowledge hiding is essential in this study as it can affect both knowledge sharing and SMMs, potentially confounding the observed relationships between negative goal interdependence and team dynamics (Johnson & Johnson, 1991; Sergeeva & Andreeva, 2016). Knowledge hiding was measured by using the scale by Babič et al. (2019) ($\alpha = .93$). Finally, age and team tenure were included because these factors can have potential influences on team outcomes, such as stronger relationships, more cohesive mental models, knowledge sharing and perceived trustworthiness (Breuer et al.,2019; van Knippenberg & Schippers, 2006).

3.4 Analytical Strategy

For the data analysis, the aim was to get responses from at least 30 teams. When closing the survey, there were 141 recorded responses. However, 8 people declined to give their consent, 12 did not complete the survey and 4 failed to disclose their team code, resulting in exclusion from the analysis. Ultimately, there were 119 responses and 32 teams, included in this study. Moreover, one attention check was included in the survey. The attention check was answered correctly by 68% of the respondents and 32% of respondents failed the attention check. It was decided to include the responses. Perceived SMMs, negative goal interdependence,

knowledge sharing, perceived trustworthiness, and the control variables were aggregated to the team level so that a comparison across teams would be possible.
For data analysis and hypothesis testing, R Studio was used. The first hypothesis, on the relationship between negative goal interdependence and SMM, was tested with a linear regression model (Darlington & Hayes, 2016). The mediation hypothesis (Hypothesis 2), which examines the mediating role of knowledge sharing between negative goal interdependence and perceived SMM in hybrid team environments, was analyzed using a mediation analysis model (Baron & Kenny, 1986). The third and fourth hypotheses were tested using moderation and moderated mediation analysis methods. The control variables were included for all analyses, which included team size, team virtuality, team tenure, age, and knowledge hiding.

4. Results

4.1 Aggregation

As a next step, since the analysis in the thesis is at the team level, the individual answers need to be aggregated at the team level (Costa et al., 2013). To justify the aggregation, the rwg(j) (within-group agreement), ICC (1), and ICC (2) (interclass correlation reliability) were calculated (Bliese, 2000; James et al., 1993). A good estimate for the rwg(j) refers to the mean value equal to or above .70 (James et al., 2000). Furthermore, the ICCs were calculated. According to Bliese (2000), for the ICCs, the F-test should be significant as it shows that between-group variance is significantly greater than the within-group variance of a given measure. To justify aggregation, the ICC (2) should be larger than ICC (1) (Bliese, 2000). In Table 1, the aggregation statistics are shown for the variables. The rwg(j) values for shared mental models (SMM), knowledge sharing (KS), knowledge hiding (KH), negative goal interdependence (NI) (TW)and perceived team members trustworthiness (TW) are above the accepted threshold of 0.7, indicating strong within-group agreement, which justifies the aggregation of individual responses to the team level. The rwg(j) value for NI, while slightly below the threshold, is still relatively high, suggesting a moderate within-group agreement. Furthermore, each ICC (2) value is greater than the corresponding ICC (1) values for each variable, which is needed for justifying data aggregation. This shows that the group means are

a more reliable reflection of team-level constructs than individual responses, supporting the aggregation of data for these variables.

The ANOVA F-Statistics and the corresponding p-values (all < 0.01) provide proof that the variance between groups is significantly greater than the variance within groups for each variable. This strengthens the reliability of group means (shown by the ICC (2) values) and further approves the aggregation of data at the team level.

Table 1. Aggregation Justification Statistics

Variable	Rwg(j)	ICC(1)	ICC(2)	ANOVA F-Statistic	ANOVA p-value
SMM	0.973	0.329	0.844	4.687	< 0.01
KH	0.805	0.500	0.902	2.785	< 0.01
KS	0.912	0.252	0.916	17.769	< 0.01
NI	0.670	0.509	0.960	13.516	< 0.01
TW	0.893	0.404	0.941	14.505	< 0.01

Note: p < .001 ***

4.2 Descriptive Statistics

Several variables show significant correlations. For instance, SMM is positively correlated with KS (r = .55, p < .01) and Avg_TW (r = .73, p < .01), but negatively correlated with KH (r = -.37, p < .01) and Avg_NI (r = -.37, p < .01). KH shows a strong negative correlation with KS (r = -.63, p < .01) and TW (r = -.64, p < .01), while it is positively correlated with NI (r = .56, p < .01). Avg_KS demonstrates a strong positive correlation with TW (r = .82, p < .01) but is negatively correlated with NI (r = -.66, p < .01). Additionally, team_size shows a moderate positive correlation with age (r = .37, p < .05) and a weaker but significant correlation with KS (r = .34, p < .05). team_tenure is significantly correlated with age (r = .68, p < .01), suggesting a strong positive relationship. In terms of control variables, SMM is correlated with virtuality (r = .36, p < .01), and TW also shows a moderate positive correlation with virtuality (r = .30, p < .05).

Table 2. Descriptive Statistics: Means Standard Devitaions and Correlations

Variables	Mean	SD	Avg_SMM	Avg_KH	Avg_KS	Avg_NI	Avg_TW	Avg_ team_size	Avg_ team_tenure	Avg_ virtuality	Avg_age
Avg_SMM	5.553705	0.412406	1	-0.37**	0.55**	-0.37**	0.73**	-0.10*	0.10*	0.36**	-0.08
Avg_KH	2.440811	0.691974	-0.37**	1	-0.63**	0.56**	-0.64**	0.03	-0.11	-0.04	-0.06
Avg_KS	5.558650	0.492629	0.55**	-0.63**	1	-0.66**	0.82**	0.34*	0.05	0.23*	0.24*
Avg_NI	2.226451	0.673539	-0.37**	0.56**	-0.66**	1	-0.61**	-0.18*	0.10	-0.33**	-0.05
Avg_TW	5.601029	0.562044	0.73**	-0.64**	0.82**	-0.61**	1	0.13	-0.16*	0.30*	0.03
Avg_team_size	5.353125	2.107.588	-0.10*	-0.03	0.34*	-0.18*	0.13	1	0.12	-0.02	0.37**
Avg_team_tenure	62.484896	62.541513	-0.10*	-0.11	0.05	0.10	-0.16*	0.12	1	-0.38**	0.68**
Avg_virtuality	54.210565	23.321638	0.36**	-0.04	0.23*	-0.33**	0.30*	-0.02	-0.38**	1	-0.06
Avg_age	39.731771	10.016450	-0.08	-0.06	0.24*	-0.05	0.03	0.37**	0.68**	-0.06	1

*Note: $p < .001$ ***; $p < .05$ **; $p < .1$ *.*

4.3 Hypothesis testing

Hypothesis 1 The first hypothesis posited a negative relationship between Negative Goal Interdependence and perceived SMMs within a hybrid team environment. As shown in Table 3, the control variables such as team size, tenure, virtuality, age, and knowledge heterogeneity did not show statistically significant results, indicating that these factors did not contribute to the explained variance in SMM. Furthermore, the analysis revealed no significant relationship between Avg_NI and SMM (β = -0.09, t = -0.63, p = .53). The model indicated that 27.88% of the variance in SMM could be attributed to the combined predictor variables (R^2 =.28), with an adjusted R-square of 0.11, suggesting a modest model fit. None of the covariates reached statistical significance. Therefore, Hypothesis 1 is not supported.

Table 3. The linear regression model summary for the relationship between Negative Goal Interdependence (Avg_NI) with Shared Mental Models (SMM)

Predictor	Coefficient (ß)	Std. Error	t-value	p-value
(Intercept)	6.0693	0.4982	12.182	<0.001
Avg_NI	-0.0883	0.1388	-0.636	0.530
Avg_team_size	-0.0182	0.0375	-0.484	0.633
Avg_team_tenure	0.0006	0.0018	0.322	0.750
Avg_virtuality	0,0058	0.0036	1.608	0.120
Avg_age	-0.0044	0.0109	-0.404	0.690
Avg_KH	-0.1691	0.1266	-1.280	0.212

*Note: $p < .001$ ***; $p < .05$ **; $p < .1$ *.*

$R^2 = .2788$, Adjusted $R^2 = .1058$

Hypothesis 2 proposes that knowledge sharing mediates the relationship between negative goal interdependence and the development of shared mental models (SMM) in hybrid team environments. First, the control variables do not show any significance with either knowledge sharing or SMM.The mediation analysis results, presented in Table 4, show that the direct effect of negative goal interdependence on SMM is not significant ($\beta = 0.05$, $p = 0.69$), suggesting no direct relationship between these variables. The mediation path through knowledge sharing (Avg_KS) is also not significant, with an indirect effect estimate of $\beta = -0.14$ and a bootstrap confidence interval that crosses zero (-0.39, 0.08). This means that knowledge sharing does not significantly mediate the relationship between negative goal interdependence and SMM in hybrid teams and therefore Hypothesis 2 is not supported.

Table 4. Mediation model of the relationship between negative goal interdependence and SMM via knowledge sharing.

Effect Type	X on Y	Effect	SE	t-value	p-value
Direct	X on Y	0.0539	0.1320	0.4082	0.6868
Indirect	X on Y through M (Avg_KS)	-0.1422	0.1139		
	LLCI	**ULCI**	**BootSE**	**BootLLCI**	**BootULCI**
Direct	-0.2186	0.3263			
Indirect	-0.3854	0.0831	0.1139	-0.3854	0.0831

*Note: $p < .1$ *.*

Hypothesis 3 proposed that perceived team members' trustworthiness moderates the relationship between negative goal interdependence and knowledge sharing, such that the relationship would be weaker under high levels of team members' trustworthiness and stronger under low levels. The results of the moderation analysis are presented in Table 5. The control variables such as team size, team tenure, virtuality, and age show no significant impact on knowledge sharing. Regarding the primary variables, the analysis revealed that neither negative goal interdependence (β = -0.61, t = -0.72, p = .48) nor the perceived team members' trustworthiness (β = 0.33, t = 0.88, p = .39) had a significant main effect on knowledge sharing. Similarly, the interaction term between negative goal interdependence and perceived trustworthiness was not significant (β = 0.08, t = 0.57, p = .58) and therefore not supporting the proposed moderating effect. The model explained 79.24% of the variance in knowledge sharing, with an adjusted R-squared of 72.02%. However, due to the non-significant interaction term, Hypothesis 3 cannot be supported.

Table 5. Moderation analysis for the effect of perceived team members' trustworthiness on the relationship between negative goal interdependence and knowledge sharing.

Variable	Coefficient (ß)	Std. Error	t-value	p-value
Intercept	3.6804055	2.0728430	1.776	0.089
Avg_NI	-0.6092030	0.8460085	-0.720	0.479
Avg_TW	0.3316911	0.3762248	0.882	0.387
Avg_NI:Avg_TW	0.0842037	0.1483186	0.568	0.576
Avg_team_size	0.0374877	0.0268990	1.394	0.177
Avg_team_tenure	0.0003428	0.0012818	0.267	0.792
Avg_virtuality	0.0004688	0.0024231	0.193	0.848
Avg_age	0.0063676	0.0080920	0.787	0.439
Avg_KH	-0.0634391	0.1104254	-0.574	0.571

*Note: $p < .1$ *.*

R^2 = 0.7924 Adjusted R^2 = 0.7202

Hypothesis 4 proposed that perceived team members' trustworthiness moderates the indirect relationship between negative goal interdependence and SMMs through knowledge sharing. It was hypothesized that this indirect effect would be weaker at high levels of trustworthiness and stronger at low levels. The results are presented in table 5. The control variables in the

model are not statistically significant, showing no meaningful effect on the dependent variables. The findings indicate that for increased perceived trustworthiness, the magnitude of the indirect effect (negative goal interdependence on SMMs through knowledge sharing) decreases. This is consistent with Hypothesis 4. However, since the confidence interval for the index of moderated mediation includes zero (0.19 to 0.24), the moderation effect is not statistically significant. This suggests that trustworthiness does not moderates this indirect relationship, Hypothesis 4 is not supported.

Table 6: Results of the Moderated Mediation Analysis

Avg_TW (Thrustworthiness Level)	Indirect Effect of Avg_Ni on Avg_SMM via Avg_KS	Standard Error	95% CI Lower Bound	95% CI Upper Bound
5.1853	-0.1018	0.1089	-0.3232	0.1204
5.6500	-0.0787	0.0887	-0.2729	0,0856
6.2156	-0.0506	0.0971	-0.2603	0.1377
Index of Moderated Mediation	0.0497	0.1052	-0.1899	0.2393

5. Discussion

There were several research objectives in this study. The first objective was to examine the influence of negative goal interdependence on perceived SMMs. Secondly, the impact of negative goal interdependence on SMMs was assessed through knowledge sharing. Finally, this study aimed to examine whether the relationship between negative goal interdependence and knowledge sharing varies according to different levels of perceived team members' trustworthiness. The following section will discuss the findings together with the theoretical implications, the practical implications and lastly the study limitations and suggestions for future research. Although not all hypotheses are supported, this study provides valuable insights into the complex nature of team dynamics in hybrid settings.

5.1 Findings and Theoretical Implications

The study revealed a non-significant relationship between negative goal interdependence and perceived SMMs in a hybrid team setting. This challenges theoretical assumptions, such as research by Tjosvold et al. (1988) and Zand et al., (1972) who argue that negative interdependencies within the team negatively impact team outcomes. However, the negative impact of goal interdependence on SMMs might not be as straightforward in hybrid team environments (Janz et al., 1997). In a hybrid team setting, negative goal interdependence might cause different outcomes in team dynamics. Additionally, for hybrid teams, other factors might be more relevant in shaping SMMs. Research highlights the importance of other factors in shaping SMMs directly, such as communication, team learning orientation, leadership styles, and team identity (Pearsall & Venkataramani, 2015). Especially, considering the unique characteristics and challenges of hybrid team environments, factors such as communication, might become more critical in developing SMMs than negative goal interdependence (Pearsall & Venkataramani, 2015). The theoretical contribution is that negative goal interdependence has little to no impact on SMMs in hybrid teams. This emphasizes the importance of considering other factors like communication in shaping SMMs in hybrid teams. The application of theory on hybrid teams should be carefully considered due to the unique characteristics of these settings.

The study proposed that knowledge sharing mediates the relationship between negative goal interdependence and SMMs in hybrid team environments. However, the mediation path through knowledge sharing is not significant. This finding is contradictory to the theoretical understanding of knowledge sharing as a crucial component in forming SMMs (Johnson et al., 2007). This suggests that in a hybrid team setting, developing SMMs might require more complex interactions than just knowledge sharing (Maynard & Gilson, 2014). Johnson et al. (2007) identified crucial factors in forming SMMs. They highlighted the importance of knowledge sharing in shaping SMMs but considered knowledge sharing only as one part of the complex construct of SMMs. This implies that in hybrid settings, the process of developing SMMs might include factors beyond knowledge sharing. Furthermore, the ineffectiveness of knowledge sharing in hybrid team environments could explained by the unique challenges within these settings. Communication barriers and less interaction hinder the effective exchange of knowledge, diminishing the role of knowledge sharing in the formation of SMMs (Sergeeva & Andreeva, 2015). All this challenges existing research and highlights a need for broader perspectives on the building of SMMs in hybrid team settings.

The study aimed to explore the moderating role of perceived team members' trustworthiness in the relationship between negative goal interdependence and knowledge sharing. The findings showed no significant interaction between perceived trustworthiness and negative goal interdependence on knowledge sharing. The hypothesis stated that high trustworthiness would weaken, and low trustworthiness would strengthen, the negative impact of negative goal interdependence on knowledge sharing. The non-significant moderating effect of trustworthiness challenges the traditional view of trust since trust is seen as an essential success factor, especially in knowledge sharing (Mayer, Davis, & Schoorman, 1995; Robbins & Judge, 2015). However, the finding might indicate that trustworthiness may function differently when perceiving negative goal interdependence. Staples & Webster (2008) highlighted in their study that trust and knowledge are highly related to each other, but at the same time emphasized that this might be different in a hybrid team setting. Additionally, Breuer et al. (2019) suggest the traditional attributes that determine trustworthiness in traditionally, might not capture the whole complexity within hybrid teams. This further underlines the complexity of understanding trust in hybrid teams. Knowledge sharing might be explained by other variables, which are not considered in this study. This aligns with the research that knowledge sharing is influenced by other factors, such as individual attitude and team culture (Lee et al., 2010). However, the research identified trustworthiness and building trust as the main challenges within hybrid team settings which could cause the ineffectiveness of trustworthiness (Robbins & Judge (2015). All this challenges the view by Mayer, Davis, & and Schoorman (1995) that trust is a crucial factor in knowledge sharing and that it gains even more importance in the context of hybrid teams. Trustworthiness might interact differently with negative goal interdependence than in traditional settings and other factors, which are not covered in this research.

5.2 Practical Implications

The following implications may help organizations and team leaders to improve hybrid teamwork, such as developing SMMs despite the geographical dispersion and communication via technology. Firstly, due to the unique characteristics and challenges of hybrid team settings, other factors might become more relevant in shaping SMMs. Therefore, the focus should lay on fostering cooperative behaviors within the team, such as improving communication and establishing a team identity. This can be implemented by offering specific training and tools for hybrid work environments, such as leadership development or

virtual team-building tasks. Additionally, knowledge sharing should be integrated. In hybrid team settings, communication barriers and less interaction hinder the effective exchange of knowledge, potentially diminishing the role of knowledge sharing in the formation of SMMs. In a hybrid team setting, knowledge sharing is quite challenging since it is easier to engage in knowledge hiding. Research states that in a hybrid team setting, it becomes increasingly important to make knowledge explicit and ensure that everyone has the information crucial to perform their task. This can be done by introducing collaborative technological tools and knowledge management systems and deciding on guidelines for how information is reported and shared.

Moreover, since the concept of perceived trustworthiness within hybrid teams might be different and more complex than in traditional settings, managers and team members should understand the complexity of building trusting relationships within teams. While trust is seen as a major challenge in these settings, its importance is clearly emphasized. One should aim to foster trust through transparency, communication, and reliability and by particularly trying to address the specific challenges of hybrid teams. To successfully implement all of this, team members and leaders in hybrid working teams require a special set of skills. They should be trained in conflict resolution, effective communication, remote collaboration, and fostering a shared team identity. Additionally, this implementation could successfully be supported by fostering a culture that encourages ongoing learning and adaptation. By implementing these steps, organizations can enhance the effectiveness of their hybrid teams.

5.3 Limitations and Future Research

It is important to consider the following limitations when interpreting the results of this study. Firstly, participants failed the attention check. This indicates a lack of complete focus, potentially affecting the reliability of the results. A suggestion for future studies could be to include even more attention checks and to make the survey as concise as possible. Secondly, for many teams, only a small number of responses were recorded since not all team members participated. This incomplete representation could introduce bias into the results. To increase participation anonymity should be emphasized. Additionally, providing incentives and catching interest in the research outcome could help. For his study, to increase the willingness to participate, a benchmark report was offered, which compares the team with the average of all the other teams. Thirdly, the respondents primarily consisted of contacts from prior work

experience and family and friends employed in various companies. Consequently, the sampling was not random, which limits the external validity of the findings. Most of the respondents were primarily from Germany (88.14%). To have a more diverse sample, future research should utilize random sampling techniques Another limitation is that the data has been collected at one point in time only, which might cause less representative reality. Conducting a longitudinal study would have allowed to gain more comprehensive insights since it would have captured the temporal dimension of SMMs. Especially in today's dynamic working environment with hybrid teams, the perception of SMMs can change over time. One limitation concerning SMMs is the measurement. To measure SMMs within teams, the study focused on perceived SMMs since actual SMMs are difficult to measure with surveys and Likert scales. However, perceived SMMs do not necessarily reflect actual SMMs. Future research should consider perceived and actual SMMs. Lastly, another potential limitation especially in cross-sectional studies is Common Method Variance (CMV). It can cause potential bias in studies where the same respondents answer all the questions. To mitigate CMV, research should use multi-source data by collecting data about different variables from different groups within the study (e.g. team members and team members). This can decrease potential bias and lead to more balance. However, according to Bozionelos and Simmering (2021), the likelihood that CMV invalidates results in studies is quite low.

6. Conclusion

This research provides valuable insights into the team dynamics of hybrid work settings, which are a crucial part of today's globalized and technologically based working environment. The study challenges the theoretical assumption that negative goal interdependence directly diminishes SMMs in hybrid teams, indicating the need for a broader perspective. The non-linear relationship between knowledge sharing, negative goal interdependence, and SMMs shows the complexity of knowledge management in hybrid team settings. Furthermore, the study revealed a non-significant moderating effect of trustworthiness on knowledge sharing in the context of negative goal interdependence. Trustworthiness might interact differently with negative goal interdependence than in traditional settings and other factors, which are not covered in this research. The application of findings on team dynamics in a hybrid team setting should be carefully considered due to the unique characteristics of these settings. Future research should take a broader perspective on the building of SMMs in hybrid team settings and investigate other variables like organizational culture, and leadership styles, that

further give insights about hybrid team dynamics. The given implications hold value for managing future research and applications in team dynamics.

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8 Appendices

Survey

Shared mental models

Team members have a similar understanding about…

- Equipment
  - How to use other team members' equipment
  - What equipment is important for which tasks
  - The tools needed to complete our tasks
  - The technology needed to complete our tasks

- Task
  - Specific strategies for completing various tasks
  - How to deal with the task
  - How best to perform our tasks
  - The relationships between tasks

- Interaction
  - How to communicate with each other
  - Sharing information with each other
  - How we should interact with each other
  - The best methods to communicate with each other

- Composition
  - Each other`s knowledge
  - Each other's abilities
  - Each other's skills for doing various team tasks
  - Each other's individual strengths and weaknesses

- Temporal

- Our deadlines
- How quickly we need to work
- Appropriately timing our work
- Coordinating the timing of our work

Items were scored on seven-point Likert scales ranging from 'Strongly disagree' (1) to 'Strongly agree' (7).

Negative Goal Interdependence

- Goal attainment for one team member prevents goal attainment for the other team members
- Success for one team member implies failure for the other team members
- Benefits for one team member involves damages for the other team members
- Gain for one team member means loss for the other team members

Items were scored on seven-point Likert scales ranging from 'Strongly disagree' (1) to 'Strongly agree' (7).

Knowledge Sharing

- Members of our team share their special knowledge and expertise with one another.
- If a member in our team has some special knowledge about how to perform the team task, he/ she will tell other members about it.
- There is virtually no exchange of information, knowledge, or sharing of skills among members of the team. (reverse coded)
- More knowledgeable team members freely provide other members with hard-to-find knowledge or specialized skills.
- Members of our team provide a lot of work-related suggestions to each other.
- There is a lot of constructive discussion during team meetings.
- Members in our team provide their experience and knowledge to help other members find solutions to their problems.

Items were scored on seven-point Likert scales ranging from 'Strongly disagree' (1) to 'Strongly agree' (7).

Perceived team member`s trustworthiness

- In this team, people can rely on each other.
- We have complete confidence in each other`s ability to perform tasks.
- In this team, people will keep their word.
- There are some hidden agendas in this team.
- Some people in this team often try to get out of previous commitments.
- In this team, people look for each other`s interests honestly.

Items were scored on seven-point Likert scales ranging from 'Strongly disagree' (1) to 'Strongly agree' (7).

Knowledge Hiding

Think of a situation when a team member made a request for knowledge, and the other team members declined. In this situation, we (team members)…

- agreed to help each other but did not really intend to do this.
- said that we were not very knowledgeable about the topic.
- explained that we would like to tell, but were not supposed to
- explained that the information is confidential and only available to people.
- told that our boss would not let anyone share this knowledge.
- said that we would not answer the question.
- agreed to help each other but instead gave information different from what was requested.
- told that we would help out later but stalled as much as possible
- offered some other information instead of what was requested
- pretended that we did not have the requested information.

- said that we did not know, even though we did
- pretended we did not know what the team was talking about

Items were scored on seven-point Likert scales ranging from 'Strongly disagree' (1) to 'Strongly agree' (7).

Sociodemographic

- What is your age (in years)?
- What is your gender?
- List of countries
- What is the highest level of education you have completed?
- What is your employment status?
- What is your role in this team? (Team leader or member)
- What is the primary function of this project team?
- How long have you worked in this team?
- How many team members and formal leaders (including yourself) are in this project?
- How long have you been the leader of this team?
- Please indicate the proportion of time you typically work virtually and face-to-face in this team per week (the sum of percentages entered below should be 100%)
- How familiar are you with the members of this team, for example, their reputation, personality, strengths and weaknesses, or their way of working?
- How much experience do you have working with these team members?
- How frequently does the team interact, on average, each week?
- In how many other teams are you actively and concurrently involved (excluding this one)? Please indicate 0 if not applicable
- Please, indicate how many hours per week do you typically work in this team and in other teams? Please indicate 0 if not applicable