Do Expectations and Goals Promote Learning Satisfaction and the Mediating Role of Collaboration

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Abstract

Collaborative learning (CL) environments in higher education have shown beneficial outcomes for participants. There is limited literature on the structure of CL that leads to students' satisfaction with a learning experience (SLE) and how perceived collaboration (PC) affects this relationship. The current study introduced an intervention to facilitate CL, called a group agreement (GA). We investigated whether PC mediates the relationship between GA and SLE. Previous studies suggested that a well-established collaboration context leads to higher SLE levels due to shared expectations within a group, open communication and discussion. In the present study, we compared two samples of bachelor thesis students. Group agreement was implemented as an intervention for the student group of 2022-2023, while students in the 2021-2022 cohort did not participate in the intervention. These two samples were compared using an independent t-test (N=126). Results showed no evidence of a mediating role of perceived collaboration. No significant difference was found between the two cohorts on their score on perceived collaboration and satisfaction with a learning experience. Lastly, PC was found to explain 23% of the variation within SLE. More research is needed to determine if GA interventions are effective. Limitations and future research recommendations are discussed.

Keywords: Collaborative learning, Group work, Group formation, Perceived collaboration, satisfaction with a learning experience, Bachelor thesis group

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Collaboration

Collaborative learning (CL) has been discussed, researched, and employed in higher education since the early 1980s (Loh & Ang, 2020). In collaborative learning, groups are formed to accomplish the goal together. The essential concept of CL is that learning is better within a group than alone. Learning outcomes are improved when CL strategies are applied (Johnson & Johnson, 1999). According to Frey (2003), CL group formations imply democracy, equality, equity, solidarity, and social responsibility. The literature about CL lacks research on implementing and facilitating it successfully. Many institutions are interested in collaborative groups, precisely, how to successfully build a collaborative group, which factors influence the constitution of one, as well as how to promote collaboration. Collaborative learning has been shown to have long-term benefits, such as building confidence (Caulfield & Persell, 2006) and improving social and communicative skills (Johnson & Johnson, 1999). In the present research, we are interested in investigating if an intervention soon after group formation can create more effective collaboration.

At the University of Groningen, in the Faculty of Psychology, bachelor thesis groups are formed based on topic preferences. The groups are comprised of up to 6 members who spend a semester creating and conducting research collaboratively while supervised by a faculty member. The theses, with respective research questions, are written individually. This year, contrary to previous years, each bachelor thesis group was asked to fill in a group agreement at the beginning of their collaboration on the project. In this study, the group agreement (GA) concerns a written document of expectations between the group members. Introducing the GA in the Bachelor thesis group aims to facilitate collaborative learning. Facilitation of collaborative learning (CL) is essential because of the long-term effect of CL mentioned above and to encourage successful task completion. In the following pages, the group agreement will be explained in depth, while the full version of the document can be found in Appendix 2.

Johnson and Johnson (2014) distinguish between four types of collaborative learning: formal cooperative learning, informal cooperative learning, cooperative base groups, and constructive

controversy. These types of CL differentiate between tasks entailed and the length of the collaboration. In the present study, participants engage in formal cooperative learning. Formal cooperative learning groups embrace achieving a shared learning goal to be completed jointly for several weeks, in our case, for 14 weeks. The instructor specifies objectives for the lessons, teaching the ideas, principles, and techniques that students are to acquire. Later, the supervisor monitors the functioning of the learning group and aids students in academic learning if needed (Johnson & Johnson,2014). To summarize, we are interested to see if the intervention of group agreement facilitates collaborative learning and if the collaborative experience results in students' satisfaction with a learning experience.

Perceived Collaboration

Perceived collaboration (PC) is a variable of interest in our research. It concerns a measure of in-group collaboration obtained by the opinion of each participant from the group. Perceived collaboration is a degree of a group working jointly and supporting each other to reach mutual goals (Bruffe,1995). Aspects of collaboration include active discussion of tasks at hand, future tasks, division of labor, group work, executing given tasks, offering help, and helping each other. In order to implement collaboration successfully, a group needs to listen to all participants and practice consensus decision-making (Leon-del-Barco et al.,2018). We are interested in the level of experienced collaboration from member of the group because they partake in collaborative learning. This measure is essential for us to see if group agreement influences collaboration for students to experience the long-term benefits discussed above.

Satisfaction with a Learning Experience

According to an extensive body of research, collaborative learning environments are associated with increased success in learning (Johnson & Johnson, 2002). In the following research, we will instead focus on students' academic experience, namely their satisfaction with a learning experience (SLE), while working in a collaborative learning group. SLE is a separate construct from the actual acquisition of knowledge (Calderon, 2013). Student satisfaction is linked with students' perception of enjoyment and accomplishment in the learning environment (Sweeney & Ingram, 2001).

SLE concerns the extent to which a learning experience meets the student's expectations. Several factors influence satisfaction with students' learning experience, such as clarity of expectations, workload, quality of communication, and scheduling (So & Brush,2008). Recent research has focused on SLE since it endorses the notion of students as university customers. It has been shown to be one of the critical sources of new enrollments and supports the development of corporate reputation, which in turn brings funding to academia (Parahoo et al.,2015).

Group Agreement

The current research introduces an intervention called group agreement (Appendix 2). Each bachelor thesis group was instructed to fill in a Group agreement at the beginning of their collaboration on the project. A group agreement (GA) is a written document of expectations between the group members. The aspects covered in the group agreement were; goals, cooperation, meeting, communication, policies, and procedures, all referring to the bachelor thesis project. For the purpose of this study, we argue that communication of these aspects through GA between group members results in a more structured group environment.

Communication in collaborative learning is essential for successful collaboration (Johnson & Johnson,2007). Limited research can be found on the effects of writing down the goals and expectations shortly after formation. Therefore, with the introduction of a GA, we aimed to make this the primary focus of the present research. Previous research has focused on different aspects of communication, such as communication conflict (Kramer et al., 2007; Wu et al.,2020), how cooperation learning promotes future communication skills (Millis, 2010), and on creating an intervention to promote one aspect of collaborative learning such as social cohesion (Croy & Eva,2018). Consequently, our research differs as it focuses on an intervention proposed to facilitate collaborative learning, introducing its essential aspect within a group. For this study, we argue that group agreement is a tool for communicating expectations and ways of communicating: social norms, goals, and expected way and frequency of communication. Therefore, we hypothesize that the group agreement will help with the constraints of group collaboration and satisfaction with a learning

experience. Such constraints are diverse undisclosed expectations between group participants (Kramer et al., 2007) and an unstructured collaborative environment (Dong & Guo,2013; Gillies, 2008).

Group Agreement and Satisfaction with Learning Experiences

The group communication procedures in small groups were found to predict satisfaction (So & Brush, 2008; Jung et al., 2002). Kramer et al. (2007) found that the quality of communication and equal involvement within a group was the source of variation in satisfaction with a learning experience (SLE). Quality of communication concerned the extent to which participants within a group found their communication to be of quality (Kramer et al., 2007). In the present research, an intervention of group agreement is assumed to aid groups with communication and establish grounds for equal involvement. At the start of their collaboration, a group agreement (GA) aids the group in establishing how they expect their group work to progress. One of the parts of a group agreement (Appendix 2) is discussing communication expectations and the frequency of meetings. While in the second part of a group agreement, students discuss how they prefer to work as a group and what kind of task they want to collaborate on; these are assumed to help with equal involvement.

Additionally, Dong and Guo (2013) found that working collaboratively in a well-established environment leads to higher satisfaction with their learning. A well-established working environment concerns a project designed with different scopes and complexity. These projects are created to build students' knowledge and skills step-by-step. A bachelor thesis project requires students to work closely with each other in order to create and reach goals. If all students agree on the contents of a GA, it is assumed that it creates a structured learning process and group procedures.

Group Agreement and Perceived Collaboration

As previously elaborated, we argue that GA introduces high-quality communication, shared expectations, and a structured learning environment. Dong and Guo (2013) found that collaboration does not come naturally to students, especially those who previously did not work in a collaborative learning environment. Hence, proper guidance is needed to foster collaborative learning, for example, by creating a shared understanding of the project. Gillis (2008) suggests that students in organized collaborating groups display more collaborative and helpful behaviors than their classmates in unstructured groups. Behaviors include providing each other with more in-depth assistance and guided

directions to aid learning. Therefore, due to the guidelines of GA, we anticipate similar outcomes of collaboration between our students. Another aspect students establish while writing GA are uniform expectations, which have been linked to indicating less competitive group behavior. Less competitive group behaviors have been shown to predict a productive collaborative learning environment (Ladbury & Hinsz,2018).

Perceived Collaboration and Satisfaction with a Learning Experience

Numerous studies have linked the collaboration level (PC) and satisfaction with a learning experience (SLE). So and Brush (2008) found a moderate positive correlation between CL and students' satisfaction with the course. Kitchen and McDougall (1998) found that most students in their study rated their satisfaction with a learning experience high in a collaborative learning experience. Last year's study upon which we built ours (Jacobs, 2022) found similar results, where collaboration was positively correlated with SLE. Jung et al. (2002) concluded that collaboration between learners relates to learner satisfaction; they proposed it was due to interaction created in the CL group. Several studies have found that student-student interactions were the source of variation in SLE (Parahoo et al., 2016; Moore,1989; Hollenbeck et al., 2011). These interactions are dominant in the CL environment within our bachelor thesis groups since they are needed to accomplish a task.

Group Agreement, Perceived Collaboration, and Satisfaction with a Learning Experience

As previously mentioned in this study, the relationship between group agreement, perceived collaboration, and satisfaction with a learning experience will be investigated. Investigating factors that might influence collaboration may provide insight into how to promote collaborative learning. Students reportedly pay more attention to collaborative practices, norms, and group organizing activities in the second half of the course as the finalization of the project is approaching, according to Dewiyanti et al. (2007). The assumed reason is that group processes take time and do not happen during group formation. Therefore, a group agreement could expedite the formation of these processes by introducing aspects facilitating collaboration.

Additionally, the researchers (Dewiyanti et al. 2007) suggested supporting group members into CL, and we tried to use our intervention of GA (Appendix 1). Positive relationships have been repeatedly found between collaboration and satisfaction with a learning experience (So & Brush,2008;

Kitchen& McDougall,1998; Jacobs, 2022; Jung et al.,2002). In the present study, we are interested to see if the relationship between group agreement and satisfaction with a learning experience is mediated by Perceived collaboration.

Current Study

The focal point of our research is to examine if the intervention of the group agreement (GA) could aid students in groups to collaborate better and if this collaboration culminates in higher satisfaction with the learning experience. Our contribution to the field helps an established body of knowledge distinguish essential aspects when creating an educational group or facilitating group cooperation in an educational context. This research builds upon the work of Psychology Bachelor students at the University of Groningen in February 2022 (Jacobs, 2022). Data from 2021-2022 will be compared to 2022-2023 data. Both cohorts were assessed with the questionnaire created by bachelor thesis students (Funck,2020) in order to assess the level of perceived collaboration (PC) and satisfaction with a learning experience (SLE) in their respective bachelor thesis groups.

Previous studies (So & Brush, 2008; Jung et al., 2002; Kramer et al., 2007; Dong & Guo, 2013) highlighted the predictive relationship between high-quality communication, equal involvement, and a structured environment with satisfaction with a learning experience. We hypothesize that filling in a group agreement facilitates satisfaction with a learning experience. While students discuss elements of a group agreement, they create shared expectations of the project and create a structured environment of collaboration.

Hypothesis 1: Students participating in a Group agreement show higher satisfaction with a learning experience than students participating in groups without a Group agreement.

Led by the research (Ladbury & Hinsz,2018; Gillis,2008; Don & Guo,2013) findings mentioned above, we expect students participating in a group agreement (GA) to show higher collaboration than those participating in groups without GA. While writing GA, students discuss aspects that could aid them in creating uniform expectations and a shared understanding of the project. Examples of these aspects are goals for the projects and creating rules to help them meet their goals and expectations.

Hypothesis 2: Students participating in a group agreement show higher perceived collaboration than students participating in groups without group agreement.

Previous research findings highlight (Parahoo et al., 2016; Moore,1989; Hollenbeck et al., 2011) the importance of student-student interactions for satisfaction with a learning experience. This interaction is dominant in the CL environment within our bachelor thesis groups since they are needed to accomplish a task. Consequently, in line with previous research, we expect a positive relationship between the level of perceived collaboration and satisfaction with the learning experience in the current study.

Hypothesis 3: Perceived collaboration is positively related to satisfaction with a learning experience.

We propose that the relationship between a group agreement and satisfaction with a learning experience is mediated by perceived collaboration. While discussing and writing GA, students communicate their expectations of group work in the project. This creates a well-established learning environment, which results in collaboration, then perceived levels of collaboration promote students' satisfaction with a learning experience. If mediation exists, we are interested to see if there is complete or partial mediation.

Hypothesis 4: The relationship between group agreement and satisfaction with a learning experience is mediated by perceived collaboration.

Method

Participants

The data for this study were collected at two different moments in time. All participants were third-year Psychology students at the University of Groningen working on their Bachelor's Thesis at the moment of data collection. The data for the group that did not participate in a group agreement (GA) was collected in the first semester of the academic year 2021-2022 by a different group of bachelor thesis students. The data for the group that did participate in a GA was collected by a bachelor thesis group researching the present study in the first semester of the academic year 2022-

2023. From now on, we will refer to the groups that participated in the group agreement "GA" group and the ones that did not participate in the group agreement as the "no GA" group.

In the previous study for no GA cohort, there were 70 responses recorded. After cleaning the data, 57 could be taken along in the analysis (response rate 28,8%). Participants were third-year Psychology students at the RUG working on their Bachelor's Thesis at that moment. Within their thesis, students worked in groups of 5-6 members. The sample consisted of 46 female students, 11 male students, and no students identified as diverse. Their nationalities included Dutch (N = 26), German (N = 22), others (N = 8), and one without disclosure. The mean age was 22.33 years (Min = 20, Max = 28, SD = 1.65).

In the present study, for the GA cohort, 223 students participated in a bachelor thesis project. Out of these, 86 responded (response rate 37,7%); after cleaning the data, 67 could be taken into the analysis,17 participants were excluded since they indicated that they did not fill in the questionnaire truthfully, and two participants because they did not fill in the group agreement. This sample included 60 female students, seven male students, and no students who identified as diverse. The age of the participants had a range from 20 to 32 with a mean age of 22,75 years (Min = 20, Max = 32, SD = 2,75) with nationalities including Dutch (N = 38), English (N = 20), and others (N = 9).

Procedure

Before sending out the survey, the questionnaire was approved by The Ethics Committee of Psychology (ECP), and the study was perceived as appropriate for research. In order to collect responses for the academic year 2022, thesis groups 25 and 26 collectively wrote an email to kindly ask fellow thesis students who also started with their thesis in block 1a to fill in the questionnaire and help our research. The teaching secretary sent the email and link to the questionnaire to all Bachelor students working on their thesis. Further attempts to acquire responses included sharing the QR code on social media platforms such as Instagram, handing out flyers in the lectures, and personally contacting fellow students who were writing their thesis. The responses in the cohort 2022-2023 were collected from the 10th of November until the 25th of November 2022, which was during weeks 10

and 11 of the Bachelor thesis project. At that phase, most groups wrote an introduction and designed the study. The procedure for the data collection in 2021 was identical. In both studies, a convenience sample was used to collect the data of undergraduate psychology students taking part in the bachelor thesis course at the University of Groningen.

When opening the link to the questionnaire, participants were first asked to read through the topic's relevant information and a detailed description of the study. Here the two head researchers (José Heesink and Else Havik) and the research question "Which factors improve or impede the level of cooperation, cohesion, and learning experience within a bachelor thesis group?" were introduced. On the first page, participants were informed what was required of them, the possible consequences of participating in the research, confidentiality, and contact information in case of questions or concerns. In order to continue with the questionnaire, the participants had to agree to the informed consent. At the end of the questionnaire, the participants were asked if they answered truthfully and given the head researcher's contact information for any follow-up questions they might have.

Materials

Questionnaire

The online questionnaire used in this study was created by Bachelor Thesis students from the Psychology department at the University of Groningen in 2021 (Funck, 2020). In addition to questions for general information, the questionnaire (see Appendix 1) contains nine scales, namely; general information, satisfaction with a learning experience, perceived collaboration, well-being, teaching presence, positive interdependence, individual control, sense of belonging, attitude towards collaborative learning, attitude towards teamwork and physical presence. The questions for general information regarded demographics such as; gender, age, nationality, number of group members, and gender composition of the Bachelor Thesis group. The questionnaire contained three attention checks to whether the participant was paying attention to the question-and-answer possibilities. The current study used only satisfaction with a learning experience and perceived collaboration scales.

The questionnaire was identical for the no GA and the GA group. However, seven questions for the GA group were added to the original questionnaire to gather information about how the students used and experienced the intervention of writing group agreement. The questions covered participating in writing and filling it, personal opinion on the usefulness of the group agreement, and personal opinion of its influence on the group work. The answers to these questions are used to report on manipulation. Complete questions can be found in Appendix 1.

The satisfaction with a learning experience scale contained ten items. It was developed by Funck et al. (2020), based on the definition of learning satisfaction from So & Brush (2008), explicitly defined as "an affective learning outcome indicating the degree of learner reaction to values and quality of learning" (p. 323). Example statements included: "So far, I am satisfied with my interactions with my fellow group members." and "This project maintains a good balance between being challenging and manageable.". Answers were collected on a 5-point Likert scale (1 = Disagree, 5 = Agree.) for the ten items used in both cohorts. Cronbach's Alpha was found to be .82.

The scale used to measure perceived collaboration comprised six items based on a questionnaire made by León-del-Barco et al. (2018). León-del-Barco et al. (2018) created a questionnaire that assessed group responsibility and collaboration. For this study, we used only items that assessed collaboration. Some of the included questions were: "My group members have encouraged the others", "My group members have positively solved the conflicts and problems in the group", and "My group members have accepted criticism and suggestions positively." Answers were collected on a 5-point Likert scale (1 = Disagree, 5 = Agree.) for the six items used in both cohorts. Cronbach's Alpha was found to be .86.

Group Agreement

The group agreement (Appendix 2), added to the current study as an intervention, aims to make the collaborative learning process more concrete. The content of the group agreement was derived from a template designed by Carnegie Mellon University (n.d.). The content of the group agreement covers five aspects: the goals, the cooperation, the discussions/meetings, the

communication, and the policies and procedures. The goals relate to the goals of the group and the group's achievements. The collaboration component is centered on working in a group. Details of when and where group members anticipate collaborating as well as how everyone can contribute were supposed to be written. The communication aspect concerns the means and frequency of communication among group members. The last aspect, policies and procedures, refer to rules that can be implemented to achieve goals and expectations. The group agreement had to be completed and handed in by the group together shortly after the start of the bachelor's thesis project. All students were expected to comply with the group agreement.

Results

The collected data from both samples, one with group agreement and the second without group agreement, were combined into one sample (N = 124). The subsequent statistical analysis was conducted using the statistical software SPSS (IBM SPSS, Version 28.0.0.0., 2021) and applied to the 124 eligible participants who completed the study.

Reporting on manipulation

The descriptive statistics of the questions added to the original questionnaire regarding the experience of the Group agreements can be found in Table 1. The descriptive statistics reported in Table 1 are from the questions answered on a 5-point Likert scale**.**

Table 1

Descriptive statistics of GA scale

	Minimum	Maximum	Mean	Std. deviation
I think the contract is useful	1	5	3.04	1.34
I took filling in the contract very seriously	1	5	3.37	1.20
I think we are working better together as a group due to the group agreement	1	4	2.16	1.08

Descriptive Statistics

The descriptive statistics are described as average scores per scale across all participants, presented as one mean value per scale. As such, (n= 124) participants in the measure of the SLE had a mean response of 4.16 (SD = .57), and the PC scale had a mean measure of 3.95 (SD =.74). A comprehensive summary of the descriptive statistics, including the results per cohort, is displayed in Table 2.

Table 2

Descriptive statistics

	N	Minimum	Maximum	Mean	Std. deviation
SLE	124	2.40	5.00	4.16	.57
SLE noGA	57	2.90	5.00	4.16	.59
SLE GA	67	2.40	4.90	4.17	.56
PC	124	1.83	5.00	3.95	.74
PC noGA	57	1.83	5.00	3.85	.78
PC GA	67	1.83	5.00	4.04	.70

Note. PC= Perceived collaboration, SLE= Satisfaction with a learning experience, GA= Group agreement, noGA= without group agreement

Subsequently, the pairwise correlations between satisfaction with a learning experience and perceived collaboration were conducted. Results indicate a significant correlation between SLE and PC within each cohort. A comprehensive summary of the correlation, including results per cohort, is displayed in Table 3.

Table 3

Correlations

		Statistics
Variable 1	Variable 2	Correlation
SLE	PC	.509
SLE_noGA	PC_noGA	.592
SLE_GA	PC_GA	.426

Note. PC= Perceived collaboration, SLE= Satisfaction with a learning experience, GA= Group agreement, noGA= without group agreement

Hypothesis testing

An independent sample T-test was conducted to examine whether there was a difference in means of Satisfaction with Learning experience due to manipulation of Group agreement between two cohorts of Bachelor thesis students (H1). Before employing a t-test, whether assumptions for an independent t-test were met was checked. Results indicated that the difference in means was not significant *(t (122) = -.024, p >.05).* Therefore, hypothesis 1 was rejected. There was no evidence that students participating in a group with a GA showed higher SLE than those without GA.

A second independent sample T-test was conducted to examine whether there was a difference in means on PC levels due to manipulation of GA between two cohorts of Bachelor thesis students (H2). Before employing a t-test, it was checked whether assumptions for an independent t-test were met. Results indicated that the difference in means is not significant *(t (122) = -1.426, p> .05).*

Therefore, hypothesis 2 was rejected. There was no evidence that students participating in a group with a GA showed higher PC than those without GA.

A simple linear regression was employed to analyze if PC can significantly predict SLE (H3), applied to the 124 eligible participants of both cohorts, with and without GA. Before conducting the analysis, it was checked whether the assumptions for linear regression were met. PC, the independent variable (IV), was put into a regression analysis to predict SLE as the dependent variable (DV). The overall regression was statistically significant, and it found that PC explained 25 percent of the variance in SLE *($R2 = 0.254$, $F (1,122) = 41.641$, $p <.001$)*. The direction of the relationship was positive. Consequently, higher levels of PC predicted higher levels of SLE *($b = (.389)$, $p<.001$).*

Due to nonsignificant results found for H1 and H2, a mediation analysis to test H4 was not conducted.

Discussion

The present study aimed to determine whether the level of perceived collaboration (PC) mediates a relationship between a group agreement (GA) and satisfaction with a learning experience (SLE). The research question was tested by comparing two samples collected under similar circumstances. Participants were bachelor thesis students from cohort without (2021-2022) and with a group agreement (2022-2023).

Surprisingly, no difference was found between the two cohorts (H1) on satisfaction with a learning experience scale. The students that participated in a group agreement (GA) did not score higher on satisfaction with a learning experience (SLE) scale than participants that did not participate in a group agreement. A possible reason for these findings is that GA does not aid the groups in establishing high-quality communication, and a structured collaborative environment. We assumed GA would cause these hypothesized effects; however, they were not established. Further research is needed to investigate if and how GA can promote the aspects mentioned above, which should result in higher SLE. In order to gain close look at hypothesized effect of GA, future research could add student's perceived level of communication and perceived level of structured environment scale.

Secondly, no meaningful score difference was found between the two cohorts on the perceived collaboration (PC) scale (H2). The students participating in a GA did not score higher on PC than participants who did not participate in a GA. A possible reason for our nonsignificant result is that the indirect effect of GA on PC does not exist, meaning that GA does not create uniform expectation nor shared understanding of the project. In the previous studies (Gillies,2008; Dong & Guo,2013), these aspects were found to facilitate PC. Further research is needed to investigate if GA can create these aspects. To acquire certainty about it, future research could add scales measuring uniformity of expectations within group and shared understanding of the project

As expected, a positive relationship was found between perceived collaboration (PC) and satisfaction with a learning experience (SLE) in both bachelor thesis groups (H3). The regression analysis results were significant; it concluded that PC explained 25 percent of the variance in SLE in both cohorts combined. Students' satisfaction with their educational experience improved as they perceived more in group collaboration. This study concluded that H3 was supported. This finding is consistent with earlier research (So & Brush,2008; Kitchen & McDougall; Jung et al.,2002; Jacobs,2022).

We expected perceived collaboration (PC) to mediate the relationship between the group agreement (GA) and satisfaction with a learning experience (SLE) (H4). No significant difference was found between cohorts of no GA and GA on SLE (H1) and PC(H2), therefore the mediating relationship could not occur. Subsequently, hypothesis 4 was not supported. PC in bachelor thesis groups does not mediate the relationship between GA and SLE. The present study potentially lacked some necessary aspects, such as more in-depth guidelines of the GA and supervisors' feedback on GA content. These could help us to gain an insight at how in-depth students approached writing a group agreement.

Limitation of the current study

Limitations of this study could be resolved through future research. First, a convenience sample was used. All students taking part in the Bachelor thesis in semester 1 of the 2022-2023 project were approached to participate via email. Consequently, they could choose if they wanted to participate in our study. Out of 223 students participating in bachelor thesis groups, 67 participants'

responses were used in the study (response rate 37,7%). This is a relatively low response rate. Data in cohort 2021-2022 was gathered similarly, and their repose rate was 28,8%. Therefore, this limitation does not influence the present research's results but undermines its findings' generalizability.

As previously established, the sample of cohort 2022-2023 was compared to the sample of cohort 2021-2022, to investigate whether there is a difference due to a group agreement intervention. Due to the pandemic, students in cohort 2021-2022 experienced a lockdown prior to data collection, and a future lockdown was spoken of at the time of collecting data. This could have influenced their overall scores on the scales. As students experienced lockdown and were not experiencing social contact, when an opportunity to collaborate appeared, they might have been more eager to collaborate because they lacked social interaction. Therefore, their results on perceived collaboration and satisfaction with a learning experience scale could be higher than it would be regularly. Consequently, the cohort 2021-2022 may not be appropriate as a comparison sample, since it might not represent unbiased population scores.

Our final limitation was the emergence of variation within how the supervisors approached the setting of cooperative learning (CL) within their group. There might be a variation in understanding the concepts of CL and cultural differences in the delivery of teaching and learning. From anecdotal evidence, we learned that although some participants needed to collaborate with their group to carry out their project, they did not know what collaborative learning was. From previous research (Johnson & Johnson, 2014), we know that in CL groups, the instructor has a role in facilitating collaborative learning, which might be why there was no difference compared to no GA cohort. Supervisor of groups in this research did not receive specific instructions about CL and a group agreement. Consequently, students were not informed of how to conduct CL and the importance of GA. In the following suggestions for future studies, the possible impact of this limitation will be elaborated more.

Suggestions for future studies

In order to address the limitations mentioned above, we encourage that completing the questionnaire becomes mandatory. There is a possibility that students who answered an invitation to participate in the study are more eager to participate in academic-related tasks and are consequently more collaboration oriented than those who did not participate. In the 2022-2023 cohort, 90 percent of

participants were female (n=60), while 80 percent of females (n= 46) were present in cohort 2021-2022. Beqiri et al. (2010) state that male students are more satisfied with a collaborative learning experience. In contrast, a study by Bandeira et al. (2006) found that females score higher than males in collaboration. Therefore, for us to find the authentic scores of satisfaction and collaboration within our sample of interest, the greatest extent of a gender-diverse sample would be needed. Making participation in the questionnaire mandatory does not guarantee that it would change the results of our study, but it would make the results more generalizable.

Students of the bachelor thesis project were approached for the first time in the tenth week of the project, reminder email to participate was sent in the eleventh week of the project. There is a possibility that groups were in different phases of the project. Projects are not created the same way, and certain phases between groups are not executed simultaneously, as there are different types of studies. More reliable data could be acquired if future researchers closely collaborated with each supervisor. Gathering data in different project phases can amend the overall scale score validity. Previous research found that students collaborate more towards the end of the project (Dewiyanti et al.,2007) and the scores on satisfaction are highly influenced by the recency and profoundness of the feedback from the supervisor (Kozlowski and Ilgen, 2006; Mathieu et al., 2015). Data in cohort 2021-2022 was collected during the same weeks. Therefore, this should not explain our expected difference in a group agreement cohort. At the same time, it could help us gather a better overview of students' scores on scales depending on their project phase. Adding more assessments of collaborative experience during different project phases could account for variability. Assessments could be conducted in three rounds. For the first time after the group has been constituted, they have had three meetings and have filled in the GA. The second assessment could be at the same time our data was obtained, after the exam week of block 1b. The third assessment could be conducted after the project is concluded while students wait for their grades. The bachelor thesis project at the University of Groningen, in the Psychology faculty, is organized in a way where students participate for the whole semester. Unfortunately, for our group to finish our thesis project simultaneously with our peers, we needed to gather and analyze data in such a timeframe. Future studies can be part of a more extended project where an overview of the whole group process can be observed.

The last recommendation is to create a document for supervisors that covers all the aspects of collaborative learning they must mention per session and how to approach some issues that might arise in collaborative learning. For example, check in with the group on previously mentioned tasks and explain aspects such as interdependence in CL. In a previous study, supervisors were advised to foster a cooperative learning environment by explaining CL's fundamental principles, such as positive interdependence, individual accountability, and expected student behavior (Johnson & Johnson, 2014). In our study, instructors did not explicitly have such tasks. Doing so could create similar conditions in groups, and a more organized collaborative environment than the one in the present study, as suggested in studies (Dong & Guo, 2013). This could create a difference we hypothesized to exist due to GA.

Conclusion

This study shows that intervention in the form of group agreements does not create a difference in satisfaction with a learning experience and perceived collaboration in our sample. Additionally, it confirms previous research findings that perceived collaboration and satisfaction with a learning experience are positively related. In conclusion, more research is needed to determine if the GA intervention makes a difference.

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Appendices

Appendix 1

Items per Scale of the Questionnaire

Satisfaction with Learning Experience

The following questions are about your experiences with your bachelor thesis project until now. Please indicate to what extent the following statements apply to you.

During this project I have the opportunity to…
1. ... gain a lot of useful knowledge
2. ... expand my research skills
3. ... apply previously acquired knowledge/skills
4. … learn from my group (including supervisor)

So far I...
5.   … am satisfied with my interactions with my fellow group members
6.   … am satisfied with the use of time within meetings
7.   … am satisfied with the communication of ideas and information

This project…
8.   … is a good learning experience
9.   … is valuable for the next step in my career
10.   … maintains a good balance between being challenging and manageable

(1 = Disagree, 2 =somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = agree)

Perceived collaboration/cooperation
*Please indicate to what extent the following statements apply **to your group members***

1. My group members have encouraged the others.
2. My group members have positively solved the conflicts and problems in the group.
3. My group members have accepted criticism and suggestions positively.
4. My group members have acted with solidarity and a high degree of cohesion.
5. My group members have collaborated simultaneously in the performance of the tasks.
6. My group members have cooperated with each other.

(1 = never, 2 = sometimes, 3 = about half of the time, 4 = most of the time-, 5 = always)

Appendix 2 – Group Agreement

Group nr:_____ Date:_____

We share the following goals and expectations, and agree to these policies, procedures, and consequences.

GOALS: What are our team goals for this project? What do we want to accomplish by working together as a group?

COOPERATION: How do you prefer to work together as a group? How and on what kind of tasks do you want to cooperate? How can everyone contribute to this?

MEETINGS: How frequent do we expect to meet as a group without our supervisor, how do we organize these meetings (agenda setting, note taking etc)

COMMUNICATION: How and how frequent do we expect to communicate (e.g. use of Whatsapp group, Google drive, email)

POLICIES & PROCEDURES: What rules can we agree on to help us meet our goals and expectations?