
Effectiveness of Kindness Intervention Studies: Integrating a Kindness Persuasive Technology into a Regular University Course

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Declaration

No portion of the work contained in this document has been submitted in support of an application for a degree or qualification of this or any other university or other institution of learning. All verbatim extracts have been distinguished by quotation marks, and all sources of information have been specifically acknowledged.

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Abstract

Many students experience mental health problems, but do not easily ask for help. Fortunately, prior studies found that kindness interventions can both help improve their well-being and might be beneficial for the quality of their teamwork. In a kindness intervention, people (often repeatedly) perform or reflect upon performing a few acts of kindness (e.g., helping or thanking someone) within a specified timeframe. As acts of kindness do not require much time, money or effort and many students experience high levels of stress, a kindness intervention is very suited for students to improve their well-being. Therefore, we designed and implemented a kindness intervention for students specifically and integrated it in four university courses involving teamwork. To investigate its effectiveness, we performed both a quantitative and a qualitative study. In the quantitative study, we integrated the kindness intervention in the digital learning environment of four courses, and planned to investigate both the completion rate of the kind activities by students and the effect these have on subjective well-being and teamwork in an experiment with a 2x4 between-subjects and repeated-measures design. In the qualitative study, we investigated factors influencing the participation, engagement and retention in this kindness intervention study via focus groups and interviews with students, teaching assistants, lecturers and educationalists. Because of a very low participation rate, no conclusions could be drawn from the quantitative study. However, the qualitative study resulted in both many and a diverse range of guidelines on how (not) to design, integrate and implement a kindness intervention in university coursework. Future research is needed to study the effect of performing kind activities on teamwork. Furthermore, future studies may benefit from the discovered guidelines to improve their effectiveness.

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Contents

1	Introduction	10
2	Background	13
2.1	Kindness and its effects	13
2.1.1	What is kindness?	13
2.1.2	Kindness and subjective well-being	13
2.1.3	Kindness and teamwork	14
2.2	Existing kindness interventions	14
2.2.1	Reflective kindness interventions	14
2.2.2	Active kindness interventions	14
2.2.3	Persuasive kindness interventions	15
2.3	The effectiveness of kindness interventions	15
2.3.1	The use of participation, engagement and retention strategies	16
2.3.2	The content of a kindness intervention	16
2.3.3	The study around a kindness intervention	17
2.4	Integrating a kindness intervention	18
2.4.1	Integration in a university course	18
2.4.2	Categorizations of kind activities	18
2.4.3	The use of Behavior Change Techniques	19
2.4.4	Administration type of kindness interventions	19
3	Exploring the integration of a kindness intervention	21
3.1	Methodology	21
3.1.1	How to improve the effectiveness of a kindness intervention	21
3.1.2	Acts of kindness in literature and their suitability	22
3.1.3	How to integrate a kindness intervention in any course with teamwork	23
3.2	Results	23
3.2.1	Characteristics to create an effective kindness intervention	23
3.2.2	Kind activities for teams of students	24
3.2.3	Integrating an intervention in regular course work	24
3.3	Discussion	25

4	Investigating effects of the kindness intervention	26
4.1	Methodology	26
4.1.1	Participants and participating courses	26
4.1.2	Study design	27
4.1.3	Procedure	30
4.1.4	Materials	31
4.1.5	Implementation in Blackboard	33
4.1.6	Data analysis	34
4.2	Results	35
4.3	Discussion	36
4.3.1	Interpretation of results	36
4.3.2	Limitations of using Blackboard	37
4.3.3	Kindness intervention versus kindness study	38
4.3.4	Limitations of investigating the effect on teamwork	38
4.3.5	Limitations of investigating the effect on well-being	40
4.3.6	Limitations of time and place	40
5	Factors impacting the participation and adherence	42
5.1	Methodology	42
5.2	Results	43
5.2.1	Factors impacting the participation level	43
5.2.2	Factors impacting the engagement	45
5.2.3	Factors impacting the retention	46
5.3	Discussion	47
5.3.1	Interpretation of results	47
5.3.2	Limitations	48
6	Overarching points of discussion	49
6.1	Interpretation of results	49
6.2	Recommendations for future work	49
6.3	Contributions	50
7	Conclusion	52
A	Kindness intervention design	54
A.1	Tables with possible acts of kindness	54
A.2	Tabular overview with newly formulated acts of kindness	58
A.3	Peer testimonials	59
A.4	Tabular overview with control activities	60
B	Ethical approval materials	61
B.1	Consent form: interviews and focus groups	61
B.2	Consent form: online intervention study	62
B.3	Information sheet: interviews with teachers	63

B.4	Information sheet: online intervention study	65
C	Study materials	67
C.1	Interview questions	67
C.2	Demographics questionnaire	67
C.3	Text-based game: actual persuasiveness of Cialdini's principles	68
C.4	Blackboard invitation announcement	69
C.5	Teamwork and Well-being questionnaire	69
C.6	Activities in Blackboard	71
C.7	Protocol for focus groups/interviews	71
D	Interpretation of results	74

List of Tables

4.1	Table with the kind activity categorizations which are incorporated in this study to determine and achieve variety	29
4.2	Table with accessibility (dates) of questionnaires for students	33
4.3	Summarizing/Overview table with teamwork logistics of participating courses . .	34
4.4	Table showing the inconsistencies in the activity of the participants	36
A.1	Table with acts of self-oriented kindness found in literature	54
A.2	Table with formal acts of other-oriented kindness found in literature	55
A.3	Table with informal acts of other-oriented kindness found in literature	57
A.4	Table with acts of kindness in the 'Generosity' category	58
A.5	Table with acts of kindness in the 'Gratitude' category	58
A.6	Table with acts of kindness in the 'Positivity' category	59
A.7	Table with acts of kindness in the 'Friendliness' category	59
A.8	Table with control activities in the 'Food/drink' category	60
A.9	Table with control activities in the 'Surroundings' category	60
A.10	Table with control activities in the 'This day' category	60

List of Figures

4.1	Schematics showing the planning of the intervention/study. The top one shows the planning over the first eight weeks from each course. The bottom one shows the planning for each week with activities and the well-being/teamwork questionnaire.	31
5.1	Venn diagram with the main impacting factors for the participation level, engagement and retention of the students for the kindness intervention study.	44
B.1	Consent form used for interviews and focus groups	61
B.2	Consent form used for online intervention study with the students	62
B.3	Information sheet for interviews with the teachers, page 1 of 2	63
B.4	Information sheet for interviews with the teachers, page 2 of 2	64
B.5	Consent form for online intervention study with the students, page 1 of 2	65
B.6	Consent form for online intervention study with the students, page 2 of 2	66
C.1	Well-Being Scale (Lui and Fernando, 2018)	70
C.2	Teamwork Scale for Youth (Lower et al., 2017)	71
C.3	Screenshot of an activities test	72
D.1	Axial coding framework on the factors impacting the participation level in the kindness intervention study	75
D.2	Axial coding framework on the factors impacting the engagement in the kindness intervention study	75
D.3	Axial coding framework on the factors impacting the retention in the kindness intervention study	76
D.4	Overview of the (sub)categories in the axial coding frameworks on the factors impacting the participation, engagement and retention in the kindness intervention study	77

Chapter 1

Introduction

Many students experience mental health problems, especially due to high levels of stress and social anxiety (Ciocarlan et al., 2017; Storrie et al., 2010; Linden and Stuart, 2020). Engaging in kind activities can increase one's subjective well-being without requiring much time, money or effort (e.g., Lyubomirsky et al., 2005; Binfet, 2015; Binfet et al., 2021; Shillington et al., 2021). Various interventions and persuasive technologies already exist which, among other goals, aim to encourage students to perform acts of kindness in order to improve their well-being (e.g., Otake et al., 2006; Park, 2019; Shillington et al., 2021).

A standardized approach to develop these kindness interventions with a high impact, participation and adherence level has yet to be established (Ciocarlan, 2020). Investigating the effectiveness of a kindness intervention in theory and practice should thus be one of the main concerns when studying kindness interventions. Furthermore, limited research efforts have been directed at investigating adaptations in regular (i.e., no matter their domain) university courses, and even less at their effect on student teamwork in such courses. However, prior work indicates the need for such integration (e.g., Binfet, 2015; Binfet et al., 2021; Shillington et al., 2021).

Students do not easily ask for help to improve their well-being by themselves, so proactive support has to be provided (Storrie et al., 2010; Linden and Stuart, 2020; Binfet et al., 2021). The integration in a university course would be an effective approach to prevent this issue (Binfet et al., 2021). Investigating student teamwork in university courses is especially interesting, because kind activities not only improve subjective well-being for both givers and receivers (e.g., Binfet, 2015; Hui et al., 2020; Shillington et al., 2021), but also (among others) social connectedness and peer acceptance (e.g., Binfet, 2015; Ciocarlan, 2020; Hui et al., 2020).

Therefore, the first research goal of this thesis is to investigate how a persuasive technology can encourage university students to engage in kind activities to improve their subjective well-being. The second research goal is to study how such persuasive technology can be designed for and integrated into a regular university course (i.e., without affecting the course content or teaching). The third and last research goal is to evaluate the effectiveness of the designed technology in terms of the participation and adherence, and the enhancement of the subjective well-being and teamwork of the students.

To achieve these research goals, we have set up a research consisting of three parts: *[RQ1]* a study into the characteristics of a theoretically effective kindness intervention, *[RQ2]* how that theoretical effectiveness translates into practice, and *[RQ3]* an evaluation into factors impacting

the participation and adherence of such otherwise effective kindness intervention.

In order to determine a standardized approach for (developing) kindness interventions for students, we aim to find those characteristics that make a kindness intervention effective regarding its effect on subjective wellbeing and perceived quality of teamwork in theory, thus according to prior research. Therefore, we have to look into the three main aspects of this goal: *[RQ1a]* which characteristics of prior kindness interventions led to a high effectiveness, *[RQ1b]* which kind activities are suitable to be performed by students working in teams, and *[RQ1c]* how a kindness intervention can be integrated in any university course.

1. How can we integrate a persuasive technology for kindness effectively within a regular university course?
 - (a) What characteristics of existing kindness interventions can be incorporated to increase the effectiveness of a kindness intervention?
 - (b) What acts of kindness are suitable for university students working in a team?
 - (c) What requirements have to be fulfilled by the kindness intervention in order to be implemented in regular coursework?

Subsequently, we strive to design, implement and investigate the actual effectiveness of a kindness intervention following the guidelines and requirements from the first research goal in order to determine to what extent this previously determined theoretical effectiveness translates into practice. As mentioned previously, students have a low subjective well-being, and performing kind activities has been found to have a positive effect on the subjective well-being of both the giver and receiver. Therefore, we have to look into three aspects of this goal: what the effect of a theoretically effective kindness intervention is on students' *[RQ2a]* hedonic and *[RQ2b]* eudaimonic subjective wellbeing, and *[RQ2c]* perceived quality of their teamwork.

2. What is the effect of the persuasive technology for kindness (over time) on subjective wellbeing and teamwork of students?
 - (a) What is the effect on the hedonic subjective well-being of students?
 - (b) What is the effect on the eudaimonic subjective well-being of students?
 - (c) What is the effect on the perceived quality of students' teamwork?

Finally, we aim to look into another factor impacting the effectiveness of a kindness intervention: the participation and adherence. If students do not (consistently) participate, the kindness intervention can or may not help to improve their wellbeing and teamwork. Therefore, we will investigate what may impact the participation in and adherence to our kindness intervention, by studying the three aspects of this goal: the *[RQ3a]* participation level, *[RQ3b]* engagement, and *[RQ3c]* retention.

3. What factors impact participation in and adherence to the persuasive technology for kindness?
 - (a) What factors impact the participation level?

- (b) What factors impact the engagement?
- (c) What factors impact retention?

Having defined the goals and questions of this research, in the next chapter (chapter 2), we will discuss relevant definitions, concepts and theories, as well as related kindness interventions. Subsequently, we will elaborate upon the three research questions one by one (chapter 3, chapter 4, and chapter 5, respectively). For each of them, we first present in detail how we are going to answer the research question in a methodology. For the second research question (i.e., investigating the effectiveness of the kindness intervention in practice), this methodology includes the design and implementation of (the integration of) the kindness intervention in the courses. Additionally, the findings of the presented experiment are discussed. Furthermore, a discussion of the results, limitations, future work and limitations of the presented study are discussed. Having discussed all three studies and thus research questions, we then present the points of discussion relevant to this entire thesis in chapter 6. These points include the interpretation of the results, general recommendations for future work, and a listing of the contributions. Finally, the core points of both this entire thesis and for each research question individually are summarized in chapter 7.

Chapter 2

Background

In this chapter, related work and other relevant background information is presented by investigating key concepts in the form of a thematic, theoretical review. First, we discuss what kindness is and its relation with subjective well-being and teamwork. Then, we investigate what types of kindness interventions already exist. Here, we also discuss some existing kindness interventions in more detail to understand their approach taken and findings. Subsequently, we elaborate upon what may influence the effectiveness of kindness interventions according to prior work. Finally, we explore various of these techniques regarding how they can be used to develop an effective kindness intervention and integrate it as study in a university course.

2.1 Kindness and its effects

2.1.1 What is kindness?

Kindness is also known as prosocial behaviour (Binfet, 2015; Hui et al., 2020). Many definitions for this concept have been used in literature (Binfet, 2015). In this study, we will follow the explanatory definition from Koenig (2006), as it is clear and understandable, yet encompasses the content of all kindness definitions from Binfet (2015). Additionally, in contrast to those other definitions, Koenig (2006) have not only formally defined kindness (with both a category and differentiating characteristics), but also given illustrative examples. They have defined kindness as *gentle behaviour towards others (or yourself) with good intentions and without expecting anything in return*. Kindness can be separated into three components: the motivation to be kind, recognition of kindness in others, and performing kind behaviour (Otake et al., 2006). Activities falling into this last category are called *acts of kindness* or *kind activities*. To give some examples, helping someone, expressing your gratitude and smiling to someone are all kind activities.

2.1.2 Kindness and subjective well-being

Many studies have shown or found that these acts of kindness have a positive effect on subjective, mental well-being for both the giver and the receiver (e.g., Ciocarlan, 2020; Hui et al., 2020; Shillington et al., 2021). According to the recent review of Hui et al. (2020), this link is statistically significant, but weak to moderate in its magnitude. This "subjective well-being" is the scientific term for happiness, and can be split up into a hedonic and eudaimonic view (Deci and Ryan, 2008; Hui et al., 2020). Where the hedonic view focuses on how a person feels about their life (including life satisfaction, presence of positive affect, and absence of negative affect), the eudaimonic one is focused on a person's self-actualization based on their virtues in life (including accomplishments in, and worthiness of life) (Deci and Ryan, 2008; Hui et al., 2020). However, many of the studies

investigating the effect of kindness on subjective well-being have only looked at one of the two, and thus not compared the two (Hui et al., 2020). Lui and Fernando (2018) even went so far as saying that "*disparate research on hedonic, eudaimonic, and psychological well-being lacks a unifying theoretical model*".

2.1.3 Kindness and teamwork

In contrast to the subjective well-being, limited prior work has studied the effect of performing acts of kindness on teamwork. Most kindness interventions are at the individual level (e.g., Datu and Park, 2019; Park, 2019; Shillington et al., 2021). However, many reasons have been indicated by literature why performing acts of (other-oriented) kindness could improve teamwork. For example, it has been found to benefit both givers and receivers (e.g., Binfet, 2015; Hui et al., 2020; Shillington et al., 2021), encourages and strengthens social relationships (e.g., Lyubomirsky et al., 2005; Otake et al., 2006; Hui et al., 2020; Shillington et al., 2021), increases work productivity and performance (Lyubomirsky et al., 2005), and gives people an increased sense of cooperation (Lyubomirsky et al., 2005).

2.2 Existing kindness interventions

As mentioned in chapter 1, in a kindness intervention, participants repeatedly recall or perform assigned acts of kindness in an indicated time frame (e.g., a week). Various types of kindness interventions exist: some ask people to reflect upon previously performed acts of kindness (Otake et al., 2006; Aknin et al., 2012), others ask (e.g., Emmons and McCullough, 2003; Lyubomirsky et al., 2005; Park, 2019; Shillington et al., 2021) or even persuade (Ciocarlan et al., 2018) people to perform kind activities. For all of these types, researchers have studied their effect(s) on subjective well-being. In the following subsections, we will elaborate upon existing kindness interventions from each type to understand their approach and findings.

2.2.1 Reflective kindness interventions

Reflecting upon previously performed acts of kindness can be done in various ways: one can simply count how many acts of kindness they performed (Otake et al., 2006), or recall memories of previously performed acts (Aknin et al., 2012). In Otake et al. (2006)'s "*counting kindnesses*" intervention, they only asked their participants to *keep track* of how many kind activities they performed per day for one week. This counting already led to a significant increase in subjective happiness. In another study, Aknin et al. (2012) researched *recalling* prosocial spending experiences (e.g., donating money, buying a gift for someone else). Just like the other reflective kindness study, they found a significant increase in the level of happiness.

2.2.2 Active kindness interventions

Many interventions and studies - such as those from Emmons and McCullough (2003), Lyubomirsky et al. (2005), Park (2019), Binfet et al. (2021), and Shillington et al. (2021) - exist in which participants are *asked to perform* acts of kindness with the goal to increase their well-being (Lyubomirsky and Layous, 2013; Hui et al., 2020). Firstly, in three small studies, Emmons and McCullough (2003) looked in three small studies at the effect of expressing gratitude in writing on well-being, and found a significant positive effect, especially in comparison with writing down one's hassles.

Many years later, Park (2019) conducted a study using an online discussion board in a digital

learning environment. They presented the "Kindness Challenge" in which students were asked to engage in self-care. The participants performed acts of kindness, made "*selfies*" while doing so, and shared those, as well as an explanation message, with their peers. Of the students, 95% participated in their challenge, with at least 81 acts of kindness performed. No sample sizes, time frame, effect or other results of the intervention are however presented in their publication.

Conversely, Shillington et al. (2021) presented and evaluated a kindness intervention with a well-founded study design and elaborate discussion of their findings. They asked participating students in their intervention group to perform and log at least three random acts of kindness per day for two weeks. Both the control and intervention group received access to a wellness centre for the duration of these two weeks. To remind them of their task or access, they received a mail notification on day 5 and 10 of their intervention. Although this design allowed for comparing the levels of subjective well-being, the control group can with such design not be asked about their kindness without making them at the least suspicious. No significant differences between these groups were found in their study, possibly being due to not measuring immediate effects but only post-intervention. However, Shillington et al. (2021) did find that many participants preferred performing acts where they were able to see the immediate impact. Additionally, they found that the students enjoyed participating in the study and performing the acts of kindness. Some participants even indicated that performing the acts of kindness became a habit throughout the weeks.

2.2.3 Persuasive kindness interventions

Finally, only a limited number of persuasive kindness interventions exist: the only one we could find is the intervention from Ciocarlan et al. (2018); Ciocarlan (2020). They designed the online intervention "Be Kind" to *encourage* engagement in kind activities with the help of persuasive messages. These messages were based on Cialdini's persuasion principles (Cialdini, 2008, 2016). Ciocarlan (2020) created both a non-adaptive and an adaptive version: in the latter version, messages with the most effective persuasive principle based on the user's personality traits were used, whereas for the first version, the messages were not personalized. They found their intervention to be effective (see also Ciocarlan et al. (2018)), and most effective when the persuasive messages were personalized. In their dissertation, Ciocarlan (2020) also provided a corpus of possible kind activities (see also Ciocarlan et al. (2018)) based on focus groups (see subsection 2.4.2), as well as a text-adventure game which can be used to determine the actual persuasiveness of Cialdini's principles for one specific person (see also Ciocarlan et al. (2019)). Both contributions have however not yet widely been used or verified, so new persuasive kindness interventions need to take caution when utilizing them.

2.3 The effectiveness of kindness interventions

Although kindness interventions can have a positive effect on subjective well-being, they are not all equally effective. For one, the participation and adherence differs between kindness interventions (Shillington et al., 2021). Additionally, prior intervention studies have reported challenges in the ability of participants to perform the assigned kind activities. Furthermore, the magnitude of the effect on the subjective well-being in previous studies is not consistent (Hui et al., 2020). Finally, the study around a kindness intervention may influence its effect size (Hui et al., 2020). To increase

the effectiveness of a kindness intervention in terms of performance rate and beneficial effects, all these issues have thus to be taken into account. In the following subsections, we therefore discuss what is known about these effectiveness aspects.

2.3.1 The use of participation, engagement and retention strategies

Prior studies (e.g., Leslie et al., 2005; Robinson et al., 2015; Nkyekyer et al., 2021) have indicated that the effectiveness of both interventions and studies is mainly dependent on the participation and adherence of the target participants: how to get people to participate (i.e., *recruitment and participation strategies*), maintain participants (i.e., *retention strategies*), and get the participants to be and stay actively engaged (i.e., *engagement strategies*). These strategies have been identified for various sectors. Nkyekyer et al. (2021) performed a review with digital birth cohort studies, Robinson et al. (2015) with health care research, and Leslie et al. (2005) focused on physical activity programs. The themes found in these reviews had some overlap (e.g., target participant characteristics, incentives, contact metrics and methods, reminders), but not entirely (e.g., feedback features, community involvement, study personnel).

Limited research has however been directed in the area of participation, engagement and retention strategies for kindness interventions and kindness intervention studies, even though various studies have mentioned the importance of and difficulty with recruiting and retaining participants: Hui et al. (2020) looked among others into the effect of demographics (i.e., part of the target participant characteristics) on the relationship between kindness and well-being by reviewing many studies on this topic. They found that the younger the (all adult) participants, the higher the increase in mental well-being. Additionally, in contrast to their expectations, they found no such relation between the participants' gender and the effect size of the subjective well-being in their study. Choosing your target participants strategically can thus increase the effect size of a kindness intervention. Secondly, Shillington et al. (2021) indicated how their two-step recruitment protocol had a negative effect on the number of students who participated. Finally, Binfet et al. (2021) reported common inconsistencies in (i.e., irregularities in the completion rates of) performing the assigned series of kind activities in their study, despite having a participation rate of 73%. They felt these inconsistencies may be related to a lack of organization and time constraints in their study.

2.3.2 The content of a kindness intervention

When considering the inconsistencies in performing the assigned activities, various reasons exist why a person would/did not perform an act of kindness when asked. Binfet et al. (2021) and Ciocarlan et al. (2018) asked their participants for these reasons. The participants from Binfet et al. (2021) indicated that they often forgot, did not have time or opportunity to perform them, or were not willing to perform the kind act (e.g., when asked to give someone a hug). Ciocarlan et al. (2018) reported the same reasons except for the first one: their participants were sent reminders, decreasing the chance of participants forgetting to perform the activities. Furthermore, Ciocarlan et al. (2018) found that whether participants performed kind activities depended on their interests and perceived skills. Similar to the findings from Ciocarlan et al. (2018) and Binfet et al. (2021), Lyubomirsky et al. (2005) and Shillington et al. (2021) concluded that participants often forgot to perform or keep track of the kind activities, or felt the kind acts took/would take up too much

time. Shillington et al. (2021) additionally found that participants would have liked to be able to immediately log their acts of kindness, get reminders, and to get examples beforehand.

Furthermore, the frequency, order, and variety of the assigned acts of kindness may have an effect on the number and magnitude of these inconsistencies. First of all, as indicated by various studies (e.g., Layous et al., 2013; Lyubomirsky and Layous, 2013; Shillington et al., 2021), engaging in a number of kind activities over a shorter duration is more effective than performing the same number over a longer period of time (Lyubomirsky et al., 2005). Furthermore, a higher number of kind activities lead to a greater increase in well-being (Shillington et al., 2021), although the ideal number of kind activities depends on the individual (Lyubomirsky and Layous, 2013). Another important factor is the variety of the kind activities (Lyubomirsky et al., 2005): Engaging in varied activities (especially if done simultaneously) leads to a greater effect than performing the same kind acts (Lyubomirsky and Layous, 2013). Additionally, Lyubomirsky and Layous (2013) indicated that the order matters (e.g., expressing gratitude is better as a first activity than other kind activities).

Finally, which act of kindness is assigned can influence whether a participant performs it and what effect it has. For example, Hui et al. (2020) concluded that informal helping was linked to a higher increase in well-being than formal helping. However, the personality (Lyubomirsky and Layous, 2013; Ciocarlan et al., 2018, 2019), interests (Lyubomirsky et al., 2005), and culture (Lyubomirsky and Layous, 2013) of an individual participant can influence their motivation to perform a certain kind activity.

2.3.3 The study around a kindness intervention

To determine the effect on subjective well-being or teamwork of a kindness intervention, it has to be incorporated in a study. The methodology of this study can however also affect the relationship between kindness and well-being (Hui et al., 2020). For example, Hui et al. (2020) found that longitudinal studies have significantly smaller effect sizes for psychological malfunctioning than studies over a shorter time interval. Additionally, they reported that validated pro-sociality scales showed stronger effects than for example using helping frequency, but do have limitations such as being more susceptible to the social desirability bias (Hui et al., 2020). They did, however, not look at which control conditions were used in kindness studies, despite the differences in control conditions between them.

Prior kindness intervention studies have used no-treatment (i.e., only filling in subjective well-being and possibly kindness/gratitude questionnaires) (Emmons and McCullough, 2003; Lyubomirsky et al., 2005; Otake et al., 2006), mapping visited places (Binfet, 2015), reflecting on impactful events (Emmons and McCullough, 2003), listing down memories of the past day without feelings/opinions (Layous et al., 2013), performing self- (e.g., personal spending) instead of other-oriented activities (e.g., prosocial spending) (Aknin et al., 2012) or compared personalized versus random kind activities (Ciocarlan, 2020). Binfet et al. (2021) did not use a control condition at all, but instead looked only at the values pre- and post-intervention (within-subjects design). Reasoning for the control condition decision (in all these example studies) have barely been reported and often seems quite arbitrary. Clearly, no standard for control conditions in kindness intervention studies has been set. The effects on well-being (and teamwork) of (previous and future) different kindness intervention studies are therefore difficult to compare.

2.4 Integrating a kindness intervention

To integrate a kindness intervention effectively in a university course, we first have to find out to what extent guidelines already exist. Next, we have to know what categorizations of kind activities exist in order to determine how we can achieve a high variety within sets of kind activities. Similarly, to determine the suitability of incorporating persuasive techniques in a kindness intervention, the Behaviour Change Techniques used in existing kindness interventions have to be studied. Finally, we have to investigate how using an online or offline administration format would benefit our kindness intervention study.

2.4.1 Integration in a university course

Even more than other adults (Hui et al., 2020), students who engage in random acts of kindness or are the recipients of a kindness benefit, show increased positive affect and decreased negative affect (Shillington et al., 2021). Although some studies have already looked into the possible integration of acts of kindness in university courses as a subjective well-being intervention for students (e.g., Binfet, 2015; Binfet et al., 2021), it still has to be investigated further (Shillington et al., 2021).

Firstly, Binfet (2015) investigated how intentional acts of kindness can and should be incorporated into classrooms, to increase individual student well-being and improve the relations both between students, and between teacher and students. Based on a literature review, they provided a framework for this purpose consisting of: creating a recipient bank, planning acts of kindness, having the teacher verify these acts, drafting a timeline for executing these acts, and finally reflecting upon it.

Binfet et al. (2021) integrated a kindness intervention as a one-week assignment in an undergraduate health/well-being course. In addition, they investigated what (types of) kind activities students perform (see subsection 2.4.2). The intervention was introduced in the course syllabus, thereby requiring little effort by the instructor for its introduction. Similar to other interventions (see section 2.2), the participating students were asked to plan, perform and reflect upon at least five kind activities within one week dedicated to kindness. Finally, Binfet et al. (2021) also discussed that iterations of the presented assignment, grouping kind activities in themes, or asking students to work together in planning and executing kind activities may be used in future studies/courses.

2.4.2 Categorizations of kind activities

Although Binfet et al. (2021) recommended a grouping of kind activities in themes and Lyubomirsky et al. (2005); Lyubomirsky and Layous (2013) suggested assigning a varied set of kind activities, no fixed set of categories of how university students (can) perform acts of kindness has yet been proposed (Binfet et al., 2021): Many categorization ways of kind activities exist. For example, kind activities can be formal (e.g., donations to charity, volunteer work) or informal (Hui et al., 2020). Informal acts of kindness can be described as everyday actions (e.g., holding a door open, giving compliments) or more unique (e.g., shoveling snow for others, handing food out to strangers) (Shillington et al., 2021). Finally, the kindness giver may see/hear the response of the receiver (e.g., holding a door for someone) or they may not (e.g., leaving a complimentary card in a public area for someone else to find) (Binfet, 2015). A list of unique acts of kindness

encountered in the literature can be found in appendix A.1.

Other researchers have categorized kind activities in a number of themes. For example, Binfet et al. (2021) indicated various categorizations from prior literature. First, they mentioned the distinction between helping *physically*, *emotionally*, by *teaching or instructing* others, and *with chores* within the family/community context. Secondly, they presented the earlier found categories *Random/reactionary*, *Intentional* and *Quiet* kindness. In their own study, Binfet et al. (2021) found the themes: *Helping others* (being instructional, with chores or another generic/physical task), *Giving* (a gift or something else, such as time), *Demonstrating appreciation*, and *Communicating*. Ciocarlan (2020) identified other thematic categories, being: *Positivity* (e.g., smiling, encouraging others), *Gratitude* (similar to demonstrating appreciation), *Generosity* (involving giving and helping others), *Friendliness* (e.g., having meaningful conversations, being close to others), and *Self-kindness* (e.g., by taking enough breaks).

2.4.3 The use of Behavior Change Techniques

Similarly, no fixed set of guidelines exists for incorporating persuasive techniques in a kindness intervention (Ciocarlan, 2020). However, two studies describing the use of Behaviour Change Techniques in a kindness intervention were found. First, Layous et al. (2013) looked at peer testimonials to increase the participants' motivation. By explaining to participants how other students had benefited from performing similar positive activities earlier on, they tried to improve the students' perceptions of the intervention and consequently their engagement in and benefit(s) from the study. They found that in their online intervention, participants indeed showed greater increases in their well-being when peer testimonial information was included.

Secondly, and as mentioned before, Ciocarlan et al. (2018); Ciocarlan (2020) used personalized messages based on Cialdini's principles (Cialdini, 2008, 2016) to persuade people to perform acts of kindness. They personalized the persuasion in the intervention by first determining the principle most effective for an individual and then applying that principle to the message. Ciocarlan (2020) found that these personalized persuasive messages encouraged kind behaviour more than non-personalized ones. Similar to other (non-persuasive) kindness intervention studies (Lyubomirsky et al., 2005; Shillington et al., 2021, e.g.), their results showed a short-term behaviour change with some indications for a long-term effect (i.e., habit-forming). Lyubomirsky et al. (2005) indicated such habit to be especially suited for the initiation of kindness activities, when the timing and focus of the acts are varied. To conclude, behaviour change techniques may thus be very useful for encouraging acts of kindness when well-implemented.

2.4.4 Administration type of kindness interventions

Lastly, the administration format has to be carefully considered. Although offline (e.g., Emmons and McCullough, 2003; Otake et al., 2006), online (e.g., Park, 2019; Ciocarlan et al., 2018) and even hybrid (i.e., performing acts of kindness offline, but submitting logs and answering questions about them online) (e.g., Shillington et al., 2021) kindness interventions exist, most of these studies do not compare the effects of delivering and administering their intervention online, offline or hybrid. Layous et al. (2013) however, did look at differences between participants who completed positive activities online versus in-person. They found no (significant) differences between these groups, and the well-being from individuals in both groups increased more than from individuals

in the control group.

However, Layous et al. (2013) argue that both administration types have their own advantages: Offline interventions have dedicated time slots during which the participants perform the kind activities. These time slots can help them to keep focused on the activities. Additionally, direct human contact is involved in offline interventions, which is generally not the case for online ones. Students however spend much time learning in virtual contexts, and these also have potential for kindness studies (Binfet et al., 2021). Digital kindness interventions are more flexible and accessible than offline ones (see also e.g., Lyubomirsky and Layous, 2013; Park, 2019; Ciocarlan et al., 2018), and give users the opportunity to engage in kind activities anonymously. Because of the flexibility, digital kindness interventions can also more easily be personalized than offline interventions (see also Ciocarlan, 2020).

Because of the digital aspect, online interventions can involve automatic components. This allows reminders to be sent to the participants who need them without much effort (see also Layous et al., 2013), thereby reducing the risk of participants forgetting to perform activities (see subsection 2.3.2). Another opportunity of digital interventions is randomization (Shillington et al., 2021), to assign participants randomly to a control or intervention group in an intervention study, or to assign a random or pseudo-random set from an entire set of kind activities to participants. The latter is especially useful for interventions desiring to assign a variety of kind activities for a longer period of time, without requiring manual work. Digital interventions can also be made interactive (Layous et al., 2013) and include indirect human contact by for example letting participants share stories of their kind activities (e.g., Park, 2019; Ciocarlan, 2020). Finally, online intervention can be more appealing than their offline counterpart by making use of (multi)media (e.g., Layous et al., 2013; Park, 2019).

To summarize, in this chapter, we first clarified the main theme of this thesis: kindness and its effects. Then, we outlined the approaches of existing kindness intervention and discussed the effectiveness of their approaches. Additionally, we described to what extent guidelines for the integration of an effective kindness intervention already exist in previous work. In this study, we make use of all these outlined insights in order to investigate how we can design, implement and integrate a kindness intervention effectively in any university course. Furthermore, after creating such an effective kindness intervention, we can compare its results to prior work to see whether it is indeed more effective. Finally, comparing our study with these studies provides us with ideas and possible ways to tackle our research questions. In the next chapter, we will discuss and explain what we feel are suitable approaches to address our research questions in an overview of our (planned) methodology.

Chapter 3

Exploring the integration of a kindness intervention

3.1 Methodology

Following the literature review (see chapter 2), we now have sufficient background information to set up our study design and start answering our first research question. As indicated in chapter 1, we aim to explore how we can integrate a persuasive technology for kindness effectively in a regular university course (research question 1). To answer this question, we both made use of the information collected during the literature review to build on top of prior work (see chapter 2) and conducted interviews with course coordinators to learn more about possibilities to integrate an intervention study in course work.

3.1.1 How to improve the effectiveness of a kindness intervention

Firstly, we answered subquestion 1a 'What characteristics of existing kindness interventions can be incorporated to increase the effectiveness of a kindness intervention?' based on the literature review. To start with, we explored approaches taken in different kindness interventions. We included all papers about kindness interventions encountered during our literature review (see chapter 2). We considered all three types of kindness interventions: reflective, active and persuasive kindness interventions. For each intervention study, we listed the author(s) and year, an overview of the intervention design and the study design, and the findings. These are all discussed in section 2.2.

Then, we studied and compared the effectiveness of the approaches followed in the same kindness interventions. We extracted and examined both the strategies incorporated or recommended in order to improve the effectiveness and the challenges encountered in prior interventions impacting the effectiveness. We have split up these strategies and challenges in three themes: those dealing with participation and adherence, those pertaining to the content of a kindness intervention, and those concerning the surrounding study. For each strategy or challenge, we have listed the author(s) and year of the corresponding paper, and summarized the strategy/challenge and its effect(s) in section 2.3.

Having reviewed all this literature, we briefly summarized both the most effective strategies and the challenges in one overview (see subsection 3.2.1), thereby answering the subquestion 1a 'What characteristics of existing kindness interventions can be incorporated to increase the effectiveness of a kindness intervention?'.

3.1.2 Acts of kindness in literature and their suitability

Next, to answer subquestion *1b* 'What acts of kindness are suitable for university students working in a team?', we first created a list with all possible, unique acts of kindness in literature. For this review, we considered all papers about kindness encountered during our literature review (see chapter 2). (Examples of) Acts of kindness were found in the papers by Emmons and McCullough (2003); Lyubomirsky et al. (2005); Aknin et al. (2012); Layous et al. (2013); Lyubomirsky and Layous (2013); Park (2019); Ciocarlan et al. (2018); Ciocarlan (2020); Hui et al. (2020); Binfet et al. (2021); Shillington et al. (2021). Thus, the acts of kindness all came directly from previous kindness interventions or other studies investigating the relation between kindness and wellbeing or teamwork.

To make the resulting long list with kind activities easier to follow, we grouped the acts following two basic categorizations for kind activities. Firstly, we determined whether the acts were self- or other-oriented. Secondly, we determined whether the activities were formal or informal (see also subsection 2.4.2). We chose to use these and only these categorizations at this point, because per definition, these categorizations would always result in mutually exclusive sets of kind activities. Conversely, the categorizations from Binfet (2015), Ciocarlan et al. (2018); Ciocarlan (2020) and Binfet et al. (2021) mentioned in subsection 2.4.2 may be more subjective and result in kind activities being assigned to multiple categories or even to different categories by different people. The overview with all acts of kindness can be found in section A.1.

Then, we specified requirements to determine which acts of kindness are suitable for university students working in small teams. These criteria were set based on the general characteristics of the target participants, the teamwork context and the extant COVID-19 pandemic, and combined with recommendations on this topic from prior literature (see subsection 2.3.2). As a first requirement, only other-oriented acts of kindness were considered in order to enhance social and teamwork benefits (see subsection 2.1.3). Self-oriented activities such as '*Take a deep breath and stretch*' were thus excluded. For the same reason, either both the giver and receiver of the kind activity needed to be within the same team, or the students in the team had to collaborate together to perform the act of kindness. Therefore, the kind activity '*Greet a stranger*' has for example been removed.

Next, acts of kindness which have a risk of no opportunity (e.g., '*Help an acquaintance to move households*') were excluded, as participants in prior studies often gave this as reason not to perform a certain activity (see subsection 2.3.2). Including activities, which require money or a lot of time, could also be a burden for the participating students (see subsection 2.3.2). Therefore, these activities (e.g., '*Gift something nice and sweet you bought to people around you*', '*Donate money/time/materials to a charity*') have been excluded. This last requirement thus also excluded all encountered formal acts of kindness, leaving us only with a subset of the informal, other-oriented kind activities. Lastly, because of the COVID-19 regulations causing the courses to be switching between being online, offline or even hybrid all the time, we also excluded activities which would not be feasible in one of these situations (e.g., '*Holding a door open for someone*', '*Spread kindness by hiding happy messages*').

After this exclusion process, we reformulated the remaining kind activities to make them more suitable for teams of students. First, we replaced general indications to a person (e.g.,

'someone') with a reference to the (other) team member(s) (i.e., '(one of) your team member(s)'). Additionally, we added examples to the more generic acts of kindness (e.g., 'Offer to do a simple nice gesture for someone') which are suitable for teams of students (e.g., 'Remind your team member(s) to take a break'). Adding examples to these generic activities makes their intention more clear, and shows the participating students possible opportunities to perform them. This idea was also suggested in the study of Shillington et al. (2021).

By following the approach outlined above, we thus created a list with all possible, unique kind activities fulfilling these requirements and having been adjusted to fit the university context. This list with suitable kind activities for student teams, together with how these can be identified, form the answer to subquestion *Ib* 'What acts of kindness are suitable for university students working in a team?', and are reported in subsection 3.2.2. An overview with these acts of kindness can be found in section A.2. The grouping of kind activities in this appendix is related to the design and implementation of the kindness intervention of the second research question (see section 4.1.2) and can be ignored at this point.

3.1.3 How to integrate a kindness intervention in any course with teamwork

Thirdly, to answer subquestion *Ic* 'What requirements have to be fulfilled by the kindness intervention in order to be implemented in regular course work?', we conducted 30-minute interviews with the lecturers of six courses passing the inclusion criteria for our kindness intervention (see subsection 4.1.1). In these semi-structured interviews, we asked the lecturers about the context and logistics of the teamwork in their courses. The ethical approval documents and questions for the interviews can be found in appendices B and C.1 respectively. Then, we analysed the collected data by investigating the similarities and differences between the courses. The similarities show the design of regular courses to consider in order to integrate a kindness intervention or any other intervention in regular course work. Additionally, the more differences exist for a particular aspect (e.g., group formation, day of teamwork, learning environment), the more flexible the (kindness) intervention needs to be in that regard. Together they form the answer to this subquestion, and are thus reported in subsection 3.2.3.

3.2 Results

In order to determine how an effective kindness intervention can be developed and integrated in a university course, we thus both performed a literature review and spoke about the logistics of university courses with small teamwork to the corresponding course coordinators. All characteristics of effective kindness interventions, guidelines and considerations encountered are summarized in the following subsections.

3.2.1 Characteristics to create an effective kindness intervention

The investigation and comparison of existing kindness interventions led to a list of nine characteristics which can be incorporated to increase the effectiveness of a kindness intervention (i.e., the answer to research question *Ia*). The following characteristics were identified:

- including comprehensible acts of kindness with sufficient opportunity to perform them (e.g., generic activities but with examples);
- personalizing (based on e.g., personality, interests, culture) the kind activities or the messages asking/persuading the participants to perform the kind activities;

- including a variety of kind activities;
- incorporating only acts of kindness which require little time, money and effort;
- opting for a one-on-one or group format (e.g., sharing kind experiences with others) instead of self-administered;
- including more kind activities;
- spreading out the acts of kindness on only one day per week instead of over a longer period of time;
- bringing the kindness intervention to the participants;
- reminding participants about the kind activities / kindness intervention;
- showing peer testimonials to the students.

3.2.2 Kind activities for teams of students

To determine what acts of kindness are suitable for university students working in a team (research question *1b*), we first created a list of all possible, unique acts of kindness encountered in prior literature. This list is shown in appendix A.1. Then, we defined exclusion criteria based on the challenges for performing kind activities found by literature on existing interventions. Kind activities were found to be unsuitable, if:

- they are self-oriented
- they risked not having an opportunity to be performed
- they cost money
- they require more than a few minutes time
- they are not feasible to perform online or offline
- both the giver and receiver are members of the same team or multiple team members collaborate together as givers

Finally, we reformulated the kind activities to make them more fitting for teams of students by replacing general references to persons with references to team members, and adding (for them) relevant examples. The details of this process are reported in subsection 3.1.2. The resulting and final list of kind activities is shown in appendix A.2.

3.2.3 Integrating an intervention in regular course work

In order to be able to integrate/implement the kindness intervention in any university course involving teamwork (research question *1c*), both the similarities and the differences between the logistics of these courses have to be taken into account. From the interviews with the teachers of the courses, it appeared that the teamwork in all courses followed the process of 1) forming groups with a fixed size of students, 2) letting the student teams work on some course-related tasks (e.g., programming, designing research), and 3) handing in (and/or) presenting a final deliverable. The day of the teamwork in the courses was similar in the sense that students were recommended to work during lab hours (where assistance was available) but free to work together on self-chosen moments if they preferred that. In contrast, not only the group size, course-related tasks and final deliverable differed per course, but also how the groups were formed, and which digital learning environment was used and how.

Group size: The group size of the teamwork was different for the various courses. In some courses, the students worked in pairs whereas in other courses, groups of 3 or 4 students were

formed. One course used even different group sizes based on the difficulty of the project, with group sizes ranging from 2 to 5 students.

Group formation: How groups were formed also differed a lot per course. The most basic distinction in group formation is whether groups were formed by the teacher or the students themselves. However, these categories should be subdivided. Teachers assigned students to groups randomly or based on students' knowledge/background or interests. If students were allowed to form groups themselves, they can be asked to do so in the first week(s) of the course or only to indicate with whom they worked when handing in an assignment. Additionally, students can be given constraints on with whom they form groups. Furthermore, if a course includes various teamwork assignments, the groups can be kept (almost) the same or switched up after each assignment.

Digital learning environment: Although all courses were from the Utrecht University, the seven courses both made use of different digital learning environments (i.e., Blackboard and the LifeLong Learning Platform) and incorporated their chosen environment in different ways. For example, some courses put all course information and communication in the environment whereas others only put grades, the hand-in for assignments and possibly the student groups in there.

3.3 Discussion

In this study, we provided an overview of the existing kindness interventions from scientific literature, what strategies they used to obtain a high effectiveness, and which considerations have to be made to incorporate one in higher education. In this study, we simply performed a theoretical review. A future study is however needed to ensure a complete overview is obtained by following a systematic literature search and review protocol. Additionally, we only considered kindness interventions from scientific literature, as these usually report their methodology and results, whereas kindness interventions outside of literature do not need to. As the latter may provide insights as well into which strategies may be used, further research is needed to make an overview of these interventions with their methodology, incorporated strategies and results (to the extent they are known) as well.

Furthermore, we provided preliminary insights into what characteristics of university courses (with teamwork) need to be taken into account when integrating a (kindness) intervention in them. Future research is needed to get a complete overview of all important factors, and how these may for example differ per university or faculty. Furthermore, further studies could focus on (massive) open online courses, and compare the integration of an intervention in them to the regular offline (or hybrid) university courses.

Chapter 4

Investigating effects of the kindness intervention

4.1 Methodology

In the previous chapter 3, we have determined how we can integrate a kindness intervention effectively within a regular university course in theory. As indicated in chapter 1, we intended to subsequently determine to what extent this theoretical effectiveness translates into practice by investigating the effect of such theoretically effective kindness intervention (over time) on subjective well-being and teamwork of students (research question 2). For this purpose, we designed and implemented a persuasive technology for kindness to be integrated in university courses (see section 4.1.2 and subsection 4.1.5 respectively) based on the results of the previous research question (see section 3.2). To answer the second research questions with its subquestions (see chapter 1), we designed this kindness intervention to allow for conducting a quantitative, experimental study. The ethical approval documents for this online intervention study are shown in appendix B.

In the next section, we have reported the methodology for this research question. We start with a description of the participants and participating courses in this study in subsection 4.1.1. Then, we report the study design of this study, including a description of the experimental condition (the kindness intervention itself with its design) and the control condition (a similar intervention but with neutral activities) in subsection 4.1.2. Subsequently, we elaborate upon the followed procedure up to the point of the data collection in subsection 4.1.3. We then provide the reader with more details on this procedure by specifying the materials used for this study (i.e., the measures and digital learning environment) in subsection 4.1.4 and the implementation of the study in the digital learning environment in subsection 4.1.5.

Finally, in this methodology, we outline the data analysis plan for this study in subsection 4.1.6. However, we had to adjust the planned experiment to combat having a low number of participants. Even with leaving out the control condition, the number of participants was not sufficient to execute the presented data analysis plan. Therefore, we were only able to discuss descriptive information as findings for this research question in section 4.2. Afterwards, we provide an overview of the discussion points of this study in section 4.3.

4.1.1 Participants and participating courses

For this experimental study, university students were recruited because of their high level of mental health problems, as discussed in chapter 1 and indicated by many studies (Storrie et al., 2010; Linden and Stuart, 2020). Students were recruited with volunteer sampling and from four courses of Utrecht University in the Netherlands. In these courses, between 650 and 800 students were

enrolled in total. Both the participating students and the lecturers of the involved courses were not offered any extrinsic incentives for taking part in this experiment. The courses were selected based on the following criteria:

- The course is taught at the moment of executing the experiment (third period of the academic year).
- The course involves teamwork in which two to four students collaborate. Teamwork with more students are excluded to minimize group interaction effects.
- The course is a regular course, meaning that it is not focused on health or well-being.
- The course is not linked to one of the researcher or supervisors to avoid possible biases.
- The coordinator and lecturers of the course voluntarily agreed to have the experiment take place in their course.

Although not an inclusion criteria, all participating courses ended up to be Bachelor courses from the Faculty of Science. Two other courses passed these inclusion criteria, but were in the end excluded because they would require a clearly different integration/implementation method than the other courses: one made use of a different digital learning environment than all other suitable courses, the other incorporated very flexible teamwork where students only had to indicate with whom they worked in the final deliverable itself.

All students of the four participating courses got an oral and a written announcement inviting them to participate. Only students who signed the consent form were able to see more documents and tasks of the experiment. Before the control condition was removed, the intention was to randomly assign the participating students to the control or experimental condition, but in such a way that team members would end up in the same condition. The participants were not made aware of this distribution.

In our experiment, seventeen students signed consent to participate. At this point, the decision was made to leave out the control condition. Six participants only signed consent and performed none of the other tasks or activities. Two other participants did not fill in the demographics, but did fill in some activities or well-being/teamwork questionnaire. Of the other nine participants, three indicated to be male and six female. The ages of these participants ranged from 18 to 27 years ($\mu_{age} = 21.7$, $\sigma_{age} = 3.0$). Six participants originated from the Netherlands, one from Germany and England, one from Italy and one from Iran. Regarding their study programs, two Bachelor students from Information Science, Computer Science, and Artificial Intelligence each participated. A Bachelor student from Chemistry, a Master student from Human-Computer Interaction, and a guest student (in the direction of Data Science) participated as well.

4.1.2 Study design

The experimental study was planned to use both a 2x4 between-subjects and a repeated-measures design. The intervention (*neutral* or *kindness*) and time (after 0, 1, 2 and 3 weeks) would be the independent variables for the between-subjects and repeated-measures design respectively. The dependent variables were subjective well-being and teamwork. The scales used to measure these variables will be described in section 4.1.4. For the between-subjects design, the neutral intervention was designed as a control condition, and the kindness intervention as the experimental condition. We planned to incorporate a control group to be able to look at possible causal relationships between (not) participating in a kindness intervention and the dependent variables while

minimizing the influence of extraneous variables (e.g., the restrictions related to the COVID-19 pandemic). The experimental condition (i.e., the kindness intervention) consisted of persuading the participants to perform a variety of specified/assigned personalized acts of kindness on the day they worked together in their team, similar to the persuasive/personalized condition from Ciocarlan (2020), as they found that to be more effective than simply asking participants to perform random kind activities. To make the control condition equivalent to the experimental condition except for the independent variable (i.e., participating in the kindness intervention), we decided to incorporate the same intervention but with "*neutral*" instead of kind activities.

Experimental condition: The kindness intervention

As mentioned before, we created the kindness interventions based on the results of our first research question (see section 3.2) in order to determine to what extent this theoretical effectiveness translates into practice. In practice, we followed these findings by assigning four kind activities per week in the kindness intervention to be performed on one day of that week. Each weekly set consisted of a variety of kind activities. All included activities were generic activities with examples, and required little time, money and effort. For this part, we used the acts of kindness found to be suitable for university students working in a team (see subsection 3.2.2), and created the varied weekly sets following the process outlined below. Furthermore, we opted for an online format, so the students could automatically be reminded about the tasks of the kindness intervention and two persuasive techniques (personalization and incorporation of peer testimonials) could easily be incorporated. How we incorporated these persuasive techniques is reported later on in this subsection.

Determining the variety and sets of kind activities

To make sure each set of activities assigned to a student would be varied, we grouped kind activities in themes, task types and types of communication in order to form the weekly sets of activities with exactly one kindness activity from each theme, and with different activity and communication types. An overview of these incorporated categorizations is shown in Table 4.1. The final sets with a variety of kind activities can be found in appendix A.2.

Based on the themes from prior literature (see subsection 2.4.2), we defined the following thematic categories for other-oriented, informal kind activities:

- Generosity - Giving
- Generosity - Helping
- Gratitude (i.e., demonstrating appreciation)
- Positivity (e.g., smiling, greeting, spreading a positive story)
- Friendliness (e.g., spending time with others)

The categories have been assigned by first following the classification from Ciocarlan et al. (2018); Ciocarlan (2020), and then specifying the two distinct 'Generosity' categories following the categories found by Binfet et al. (2021).

Furthermore, we followed the activity classification common in literature about leisure activities (Henning et al., 2021; Karp et al., 2006): *Physical activities*, *Social activities* and *Mental activities* (also known as 'Intellectual activities'). Following Karp et al. (2006), the acts of kindness can have one or more of these labels, and we only assigned the most characteristic label(s) to them.

Finally, we categorized the kindness activities based on their potential type(s) of communication. We followed the categories with their explanations from Öneri Uzun (2020): verbal, non-verbal (e.g., smiling), visual (e.g., with photographs or drawings), and written. In this study, we added the categories 'Without communication' and 'Depends on gesture'. Some activities required thinking instead of communication (e.g., reflecting on what you are grateful for). These activities can thus be done without communication, but these thoughts could also be written down. The category 'Depends on gesture' followed from the general activities involving helping someone else (e.g., offer to do a simple nice gesture for someone). In these cases, what type of communication is involved, depends on how you can help a person or what the gesture is (e.g., holding a door open versus giving directions).

Incorporated categorizations of kind activities		
Thematic categories	(Leisure) activity type(s)	Communication type(s)
Generosity: Giving	Physical	Verbal
Generosity: Helping	Mental / Intellectual	Non-verbal
Gratitude	Social	Visual
Positivity		Written
Friendliness		<i>Without communication</i> <i>Depends on gesture</i>

Table 4.1: Table with the kind activity categorizations which are incorporated in this study to determine and achieve variety

Persuasive techniques incorporated in the kindness intervention

As mentioned before, to persuade the participants in the experimental condition to perform as many acts of kindness as possible, we incorporated both peer testimonials and personalized, persuasive messages in the intervention. These peer testimonials are quotes or paraphrased texts from previous participants/users explaining beneficial effects of the study on them (Layous et al., 2013).

Similar to the intervention from Layous et al. (2013) (see also subsection 2.4.3), peer testimonials are shown from people participating in a prior similar study. This intervention has not been performed before, so no testimonials exist from previous years. Furthermore, the study from Layous et al. (2013) is focused on writing about the best possible self and not on simple kind activities or on students, making the testimonials from that intervention unsuitable to use in this study. Therefore, in this study, we used various short peer testimonials from students who participated in the (similar) study from Ciocarlan et al. (2018); Ciocarlan (2020). These testimonials can be found in appendix A.3. The introduction of the peer testimonials was however based upon the one from Layous et al. (2013), and stated: "*Before performing the activities we assigned to you, please read these quotes from people who participated in similar studies previous years*".

Furthermore, personalized, persuasive messages similar to those from Ciocarlan (2020) are incorporated to motivate the users of the kindness intervention to perform as many kind activities as possible. The persuasiveness in each message came from one of Cialdini's persuasive principles (Cialdini, 2008, 2016); the personalization by incorporating that principle having most effect on the user/participant. Ciocarlan et al. (2019) introduced a text-adventure game to determine the influence of Cialdini's persuasive principles on an individual. As we are only interested in the principle with the most influence on the participant, the first scenario instead of the entire game

is incorporated in this study. The questions from this first scenario with the persuasive principle they correspond to as well as the persuasive messages for each of the principles can be found in appendix C.3.

Control condition: A "neutral" intervention

As no standard for the control condition in kindness intervention studies exists (see subsection 2.3.3), we considered all existing control conditions to determine which would be most suitable to incorporate in our study. This decision is described in the next paragraph. In the end, however, this "*neutral*" control condition had to be left out due to the low number of participants.

We decided not to incorporate visiting places (c.f., Binfet, 2015) in the control condition as the COVID-19 pandemic could affect the possibilities in this regard, which in its turn may affect the subjective well-being of the participants. The latter is not desired in the control condition: expecting an effect but not knowing the effect size of the tasks in the control condition on (one of) the dependent variable(s), limits our ability to determine the effect size of the experimental condition (i.e., the kindness intervention). Similarly, self-oriented kind activities or thinking about impactful events may affect subjective well-being and were therefore not incorporated as neutral activities in the control condition. Next, only filling in questionnaires may make participants aware of them being in a control group. Therefore, we decided to ask participants in the control group to list without incorporating feelings/emotions/opinions what they had done during the day, similar to the events/neutral condition from Layous et al. (2013). However, to make the control condition similar to the experimental condition, a variety of control activities was needed. Therefore, we made variations of the neutral condition from Layous et al. (2013) to be used as sets of control activities in the intervention study. These sets can be found in appendix A.4.

4.1.3 Procedure

Before the beginning of the (kindness) intervention study itself, all students from the participating courses were told that the study was about the integration of an intervention into a university course and would take approximately 5-10 minutes for four weeks to participate in. They were not told about the kindness focus of the intervention in order to enable giving participants from each condition the same information sheet and consent form without adding any biases. After having provided informed consent, we planned to assign them and their participating team members pseudo-randomly to one of the conditions (see subsection 4.1.1). As mentioned before, the control condition was left out in the end in order to counteract the low number of participants, so each participant was assigned to the experimental condition.

Before starting the actual intervention and study, the participating students were asked to complete a demographics' questionnaire (both for analysis and to determine the diversity of participants) and the first scenario from the text-adventure game from Ciocarlan et al. (2019). The latter was used to give the participants in the experimental group a personalized, persuasive message, as described previously in section 4.1.2. The demographic questions can be found in appendix C.2, the text-adventure game in appendix C.3.

Subsequently, the weeks of the intervention started. The participants were asked to fill in a survey with questions on their subjective well-being and teamwork each Friday for four weeks. We will elaborate on this survey and included scales in section 4.1.4. If they forgot to submit the survey on the Friday, the students could still fill it in during the weekend. The next Monday, but

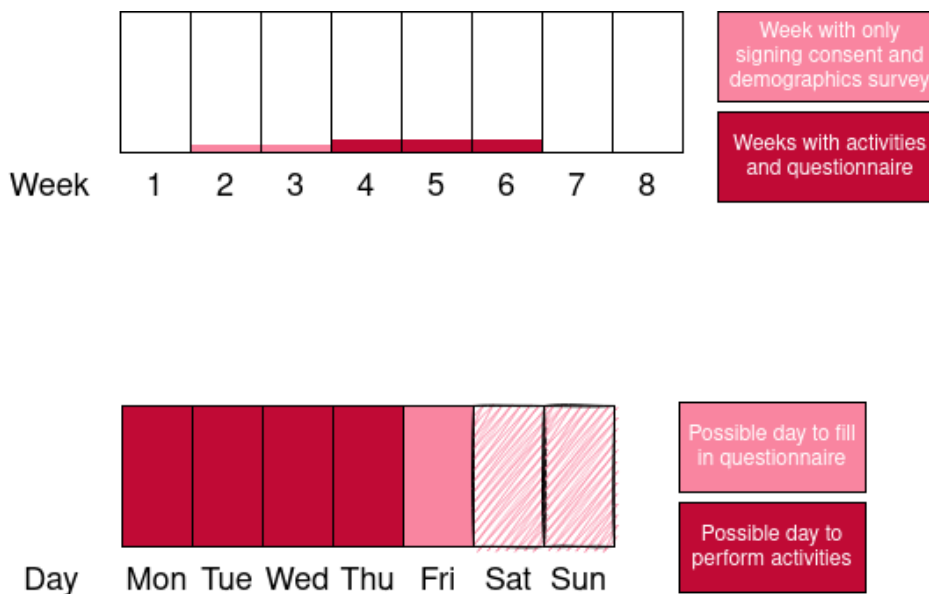


Figure 4.1: Schematics showing the planning of the intervention/study. The top one shows the planning over the first eight weeks from each course. The bottom one shows the planning for each week with activities and the well-being/teamwork questionnaire.

only in the first three weeks, the participants were asked to perform some activities. A schematic of this planning is shown in Figure 4.1.

As mentioned before in subsection 4.1.2, the participants in the experimental condition were persuaded each week to perform four acts of kindness on the/one day of their teamwork activities. Similarly, we planned to ask the participants in the control condition to perform three neutral activities. As Lyubomirsky et al. (2005), Binfet (2015) and Shillington et al. (2021) indicated, the timing and dosage of kind activities is very important for the effectiveness of the intervention. The timing of our activities has been chosen to increase the effect of the kindness on the teamwork. The dosage (four activities) is based upon the combined recommendations from Binfet (2015) and Shillington et al. (2021) to use between three and five kind activities.

The participants were asked to complete the activities all on one day, because performing kind activities on one day was found by Lyubomirsky et al. (2005) to be more effective than have them spread out over a week. In the online form with kind activities (see subsection 4.1.5 for more details), the participants could immediately indicate which of the assigned activities they had performed, as requested by some participants in the study from Shillington et al. (2021). Additionally, they were asked in the same form on which day of the week they performed the activities, in order to stimulate performing the activities on one day. The activities were only visible the days they could be completed, and the day after for participants who had forgotten to submit the form.

4.1.4 Materials

Measures

For the subjective well-being, we considered both the hedonic and the eudaimonic view, thereby following the advice from Hui et al. (2020) discussed in subsection 2.1.2. In order to validly and reliably assess both these aspects and the combination of the two, we searched for an evaluated

scale having both the hedonic and eudaimonic subjective well-being as subscale. This investigation led us to the Well-Being Scale from Lui and Fernando (2018), having a 7-item subscale for hedonic and a 3-item subscale eudaimonic subjective well-being. This scale fulfils the earlier mentioned requirement in contrast to scales used in similar kindness intervention studies (e.g., the Subjective Happiness Scale (used by Otake et al. (2006), Aknin et al. (2012) and Ciocarlan et al. (2018)), combinations of among others the Positive and Negative Affect and the Satisfaction with Life Scale (used by Binfet (2015) and Emmons and McCullough (2003))). The questions from the incorporated hedonic and eudaimonic subscales can be found in section C.5.

Regarding teamwork, we considered only perceived and not actual teamwork. Although a combination of both would give the most insight into the effects, measures for the actual performance would depend on the content of a course and thus be hard (if not infeasible) to compare between courses. In addition, measuring actual performance would involve more privacy-sensitive data, such as grades or observing people during their teamwork. Especially in a digital learning environment, such as Blackboard, investigating grades is very privacy-sensitive, because either all grades of an assignment (including those of non-participating students) or none are visible in the environment. Therefore, this study focused only on perceived teamwork. The Teamwork Scale for Youth is used to measure the perceived teamwork, because that scale is focused on a youth's perceived teamwork-related behaviours in a brief and easily-administered manner (Lower et al., 2017). These behaviours involve social relationships as well as collaboration in their work, thereby covering the teamwork-related effects of kindness interventions found in prior studies (see subsection 2.1.3). The questions from this incorporated Teamwork Scale for Youth can be found in section C.5 as well.

Blackboard

In order to provide the participating students in the four (distinct) participating courses with the same intervention, we implemented the intervention within the digital learning environment used by most courses from University Utrecht, including the participating courses: Blackboard¹. The details of how we implemented our kindness intervention study (i.e., as described in this chapter) in Blackboard is outlined in subsection 4.1.5 below. In Blackboard, students can see the courses they are enrolled in with their content. By using a dedicated section on the page of a course (a "*Content area*"), material and surveys can be shown to a specific subset of the enrolled students. Blackboard allows content managers to upload content based on rules and criteria (e.g., content only available for a limited time). Not only simple items such as files, images or text can be uploaded and added, but also for example surveys, multimedia and links to websites in- and outside Blackboard.

In this digital learning environment, participating students were not anonymous, meaning that the data was visible to both the researchers and instructors of the course. Students could not see the data of other students. For the analysis, the data was anonymously downloaded from the digital learning environment and analysed in password-protected files. This privacy-related information was made known beforehand to all target participants (both students and instructors) via the information sheet and consent form (see Appendix B). The limitations of incorporating the study in Blackboard (including practical and privacy-related issues) are discussed in subsection 4.3.2.

¹<https://help.blackboard.com/Learn/Instructor/Original>

4.1.5 Implementation in Blackboard

As mentioned previously, in the Blackboard page of each participating course, a content area was assigned for this kindness intervention study. This content area was the same for all courses. The first indication of our intervention on Blackboard was an announcement asking/reminding the course's students to participate in the research. The content of this announcement is displayed in appendix C.4. The announcement included a link to the content area of the intervention. Before anything else, one form was displayed on this intervention page, presenting the information sheet and consent form of this study. Only students who gave their consent by ticking the corresponding box in this form, were presented with more materials for this study. The information sheet remained visible for the student during the remains of the study.

Subsequently, following the planning as indicated in the procedure (see subsection 4.1.3), the activities test and questionnaire appeared one after each other. For the experimental condition, the persuasive message was shown as an item on top of the content area for the entire execution of the kindness intervention. The exact start, due and end/closing dates (where known) are shown in Table 4.2. These dates have been incorporated in Blackboard using "*Adaptive Release*" options. With this feature, sets of rules could be created controlling when the questionnaires and activities were released to (a subset of) the enrolled students. These rules have thus been incorporated for the accessibility dates, the visibility conditions (also shown in Table 4.2), to show different activities to the control and experimental condition, and finally to incorporate the personalized persuasive messages.

Accessibility (dates) of questionnaires					
Questionnaire	Week(s)	Start date (00:01)	Deadline (23:59)	Closed (11:59)	Conditions
Consent form	Week 1	circa 9 Feb.	24 Feb.	25 Feb.	Visible after introduction talk and message, and required to see any other documents
Demographics	Week 2/3	circa 14 Feb.	24 Feb.	20 March	
Well-being and teamwork 1	Week 3	25 Feb.	25 Feb	27 Feb.	
Activities 1	Week 4	28 Feb.	3 March	4 March	
Well-being and teamwork 2	Week 4	4 March	4 March	6 March	Visible after Activities 1 done/closed
Activities 2	Week 5	7 March	10 March	11 March	
Well-being and teamwork 3	Week 5	11 March	11 March	13 March	Visible after Activities 2 done/closed
Activities 3	Week 6	14 March	17 March	18 March	
Well-being and teamwork 6	Week 7	18 March	18 March	20 March	Visible after Activities 3 done/closed

Table 4.2: Table with accessibility (dates) of questionnaires for students

To ensure the data from the questionnaires was visible for the researchers, all questionnaires (including the activities) have been incorporated as a test in Blackboard. In contrast to Blackboard

surveys, the results of tests are saved in the grade centre and thereby accessible for those having 'Instructor' access to the course. The researcher access to Blackboard for each course differed per course between 'Course builder' or 'Instructor' and depended on the informed choice from the instructors. An overview of both the given Blackboard access and teamwork logistics per course is shown in Table 4.3. Two of the four courses chose to give the researcher 'Course builder' access. With this status, the grade centre and enrolled students were not visible to the researcher. This option ensured more privacy for the students, but also asked for more effort of the instructors, as they had to download the research data at the end of the study and send that to the researcher. The other two courses chose to give 'Instructor' access, which did include access to the grade centre. To limit the access to other grades in this scenario, a "smart view" was created. In a smart view, one can only see an indicated set of columns and rows of the grade centre based on indicated conditions. For our study, the smart view consisted only of rows with students who had given consent to participate, and columns with grades belonging to this research intervention. Using/viewing this smart view, all unnecessary data was thus not visible for or accessed by the researcher.

Teamwork logistics of participating courses			
Course	Researcher access to Digital Learning Environment	Number of students per team	Team creation
C1	Blackboard - Course Builder	3	students self, if needed with help from teachers
C2	Blackboard - Instructor	3 or 4	students self
C3	Blackboard - Instructor	2	students self
C4	Blackboard - Course Builder	4	randomly assigned by teachers

Table 4.3: Summarizing/Overview table with teamwork logistics of participating courses

The activities tests consisted of a short introduction, and three or four *true/false* questions showing the assigned activities. For the experimental group, the introduction also included peer testimonials (for more details, see section 4.1.2). With the help of the *true/false* questions, the participating students could indicate which activities they had (not) performed. Additionally, the activities test contained a question asking the student on which day of the week they had performed the kind activities. By asking this question, the students were encouraged and reminded to perform them all on one day. A screenshot of a sample activities test is included in appendix C.6.

4.1.6 Data analysis

Having designed and implemented our kindness intervention in the digital learning environment of all four participating university courses, we were able to execute our kindness intervention study and collect data. Then, we planned to analyse all data according to the data collection and analysis plans outlined below.

First, we calculated the scores for each data/time point of each participant. Following Lui and Fernando (2018), regarding the scores for the hedonic, eudaimonic subjective well-being, and their combination, we calculated these scores by taking the average of the corresponding item scores. Similarly, for the perceived teamwork, the mean of the item scores was used as the overall score following Lower et al. (2017). Furthermore, we wrote down for each activity

type (see section 4.1.2) of that data/time point whether they were performed by the participant. As mentioned previously, due to the low number of participants, we were not able to execute a statistical analysis. Therefore, the data analysis plan outlined in the rest of this section only remained a plan, and the findings of this research question only contains descriptive information (see section 4.2).

Having calculated all scores for each data/time point of each participant, we planned to check whether the observations are normally distributed using a combination of looking at histogram plots and performing a Shapiro-Wilk test, and compare the variance of the observations in each sample. Subsequently, we intended to investigate whether any differences exist between the participant groups from each condition in terms of subjective well-being and teamwork for pre-intervention, halfway the intervention (two data points) and post-intervention. To do so and assuming the criteria to perform a parametric test would be met, we planned to perform an independent samples t-test between these groups. This test would tell us for each of the data points whether and to what extent the results in subjective well-being and teamwork of the experimental group are (statistically) different from the control group.

Subsequently, for each condition/group separately, the differences in observations over time for subjective well-being, teamwork and (only for the experimental group) number of performed kind activities were planned to be assessed using a repeated-measures ANOVA, again assuming the criteria for this parametric test would be met.

4.2 Results

As just described, we planned to perform both independent samples t-tests and paired t-tests in order to determine the effect of the kindness intervention (over time) on not only the hedonic and eudaimonic subjective well-being but also on the perceived quality of teamwork of the students. However, we got an insufficient number of participants. Despite attempting to counteract this effect by leaving out the control group and sending additional reminders, the participants were also very inconsistent in performing the kind activities and filling in the questionnaires. Due to this low participation level and retention, no conclusions can be drawn regarding the effect of the kindness intervention on subjective well-being and teamwork. Therefore, we report instead here an overview of the inconsistencies in the retention as well as the engagement of the participants. Information about the participation level has been reported earlier on, in subsection 4.1.1.

In Table 4.4, an overview is provided showing how many participants completed which tasks. It immediately stands out that none of the participants even came close to completing all activities. Even worse, only one participant first filled in the questionnaire, then the activities test and then the next questionnaire, and could thus have been incorporated in the analysis. Even though the subjective well-being score of this participant increased as expected from a 4.30 to a 4.70, and their perceived quality of teamwork score slightly decreased from a 4.00 to a 3.88, no conclusions can be drawn from this one person.

Regarding the engagement, all questionnaires filled in by the participants were also completed, except for one form by one participant: they signed consent in the corresponding form but did not answer the additional second question about the effectiveness of Cialdini's principles. Similarly, the participants finished the completion of the activity tests they filled in, except one person

Number of participants	Demographics	Completed questionnaires	Completed activity tests
6	No	None	None
3	Yes	None	None
1	No	2	None
1	Yes	2	None
1	Yes	None	2
1	Yes	None	1
1	Yes	2	2
1	No	None	1, 2, 3
1	Yes	1, 3	None
1	Yes	2, 4	1, 3
<i>Ideal participant</i>		<i>1, 2, 3, 4</i>	<i>1, 2, 3</i>

Table 4.4: Table showing the inconsistencies in the activity of the participants

who left all questions unanswered. Of the four kind activities assigned per week, on average 3.3 were performed during the first week, 2.3 during the second and 3 during the third week. The kindness engagement of both participants who completed multiple activity tests showed a slight decrease (4 to 3 performed acts, and 4 to 3 to 3 kind activities, respectively).

4.3 Discussion

Having elaborated upon the methodology (see section 4.1) including the design and implementation (see subsection 4.1.2 and subsection 4.1.5), and results (see section 4.2) of our kindness intervention study, we will now interpret the results of this study by briefly comparing them to the findings of previous work in this area (see also chapter 2). Then, we will discuss the limitations of this study to represent their weaknesses and provide directions for future research. Firstly, we will elaborate upon the limitations of using Blackboard for a (kindness) intervention study in subsection 4.3.2. Secondly, we will discuss the limitations resulting from incorporating a study on top of a kindness intervention itself in subsection 4.3.3. Next, we will investigate the limitations resulting from our approach taken to determine the effect on teamwork and subjective wellbeing in subsection 4.3.4 and subsection 4.3.5 respectively. Finally, we describe how this study is limited by the time and place of our kindness intervention study in subsection 4.3.6.

4.3.1 Interpretation of results

Contrary to the participation rate in the study by Binfet et al. (2021), our study had a very low participation rate. However, the inconsistencies in retention were in line with what they reported. Because of this low participation and adherence in our study, the effects on subjective well-being of our kindness intervention cannot be compared to prior research.

The low participation rate of this study could have had various reasons. In the next chapter 5, we have outlined the qualitative study we performed to investigate the factors (of this kindness intervention study) which may (have) impact(ed) not only the participation rate, but also the engagement level and retention of the participants. Some decisions made when designing our kindness intervention study are however also likely to have had a negative effect. For one, because of our plans to include a control condition, we did not tell the target participants about the focus on kindness of this study. The focus on kindness may make people more interested in the study or

make it sound like more fun. Not mentioning this aspects may thus have had a negative effect on the participation rate in this study. Additionally, the participants were made aware of the privacy issue in Blackboard due to which their data would not only be visible to the researchers but also (with some effort) accessible for the instructors of the course. Students may thus also have opted out because of this limitation.

4.3.2 Limitations of using Blackboard

In line with Anderson (2003) and Bradford et al. (2007), we found that the digital learning environment Blackboard has not only its advantages, but also some limitations, such as how much time implementing a test in Blackboard takes, its (technical) inflexibility and its user interface. The integration of this kindness intervention led mostly to inflexibility difficulties when implementing tests (c.f., Anderson, 2003) as well as groups, and with the accessibility of the grade centre. In the next paragraphs, we discuss these encountered inflexibility limitations in detail, so researchers of future studies can take them into account when designing their own study.

For one, incorporating a study in Blackboard resulted in various privacy issues. Blackboard does not have the possibility to give someone *partly* access to the grade centre or part of the smart views. Not being able to see interim research results makes implementation errors hard to detect, which is especially an issue with the high number of accessibility criteria for Blackboard items in this study. Furthermore, without being able to see who gave consent to participate in the 'Course builder' access courses, we could not see how many members of a team participated and thus if they should be in the control group (only one participating member) or could also be part of the experimental condition (at least two participating team members). Hence, this limitation of Blackboard causes a trade-off to be made between having less privacy or both having less (research) validity and requiring more effort from the teacher. In this study, the course instructors were given the choice between these two alternatives. In future studies, however, one should already take this limitation into account when choosing for the administration format and digital learning environment.

Secondly, we encountered a number of limitations when creating groups. In Blackboard, the only two options to create a group are self-enrolment by the students or manually adding individual students. For example, one can thus not randomly enrol students in (sub)groups with a fixed size. Unless adding members individually, also no option exist to create groups from groups: Not only adding one (random) member from two or more groups to one group is not possible, but also simply taking the union from two or more groups is not possible.

Thirdly, Blackboard does not remember items assigned to users in previous tests. When assigning a new activity to a student and to improve variety, we wished to assign a random activity to a student which had not been assigned to that student previously. Again, Blackboard did not offer a functionality for this purpose. This limitation did not only affect the implementation used in this study, but also affects instructors who want to let students retake tests (with random questions from thematic question pools) until they pass. In such test, a student may by chance get exactly (or almost) the same questions as the previous time and pass due to the similarity between the tests instead of their knowledge and skills. Blackboard course builders and instructors need thus to be aware of this risk.

How the data of repeated tests is saved in Blackboard also showed to be a disadvantage for

this study. Tests in Blackboard can be assigned repeatedly, but its results are saved in multiple test 'attempts'. However, Blackboard also offers the opportunity to give students multiple (being unlimited or a fixed number of) attempts for one test. When using these functionalities in combination, it becomes (very) difficult to distinguish which attempt belongs to which test if a student has used multiple attempts on one of them.

4.3.3 Kindness intervention versus kindness study

Incorporating only the kindness intervention, and not the corresponding research from this study, will make the implementation and integration of it easier. Furthermore, the participation and adherence may be positively impacted by leaving the research elements out. First of all, without the research, a control condition would not be needed. Furthermore, the otherwise required consent form, demographics and well-being/teamwork questionnaires do not have to be implemented. Additionally, the activities test does not need to be a test, although the instructor may choose to keep it that way to encourage students to perform as many as possible. As a result, no conditions apply to the acts of kindness (tests), except for the dates on which they are accessible. These can however be extended to Monday morning to Friday (or Sunday) midnight, and do not have to be dependent on previous tests.

As no data/test results are needed for research, no access at all to the grade centre or a smart view is needed. Therefore, someone with (at least) Blackboard 'Course builder' access can simply implement the kindness intervention, and no effort at all is required from the instructors regarding this implementation. Regarding the kind activities themselves, all students can be assigned the acts of kindness. The instructor(s) and students can thus also speak freely about these activities and their (possible) effect on subjective well-being and teamwork. Because of this freedom, the activities may be adjusted or personalized for subsets of students if the instructor feels that to be useful. Additionally, talking about performing the kind activities can both improve the students' engagement with the intervention and the gained benefits: Not only has the recalling of kind activities proven to be effective in this regard (Otake et al., 2006; Aknin et al., 2012, e.g.), but it also brings forward two of Cialdini's principles of persuasion (Cialdini, 2008, 2016): *Social proof* and *Unity*.

Finally, various factors impacting the participation level, engagement and retention are related to the study around the kindness intervention instead of the intervention itself. The study design (e.g., the time/effort filling in the questionnaires and activity tasks take) will not have a negative effect anymore on the retention and engagement. Due to the lack of surveys, less interaction with the platform is required, decreasing the (in this study) negative effect of its accessibility. Both these factors on their turn improve the balance between the costs and gains, which are expected to increase both the participation level and retention.

4.3.4 Limitations of investigating the effect on teamwork

Especially with voluntarily participating students, investigating teamwork is risky. For example, students falling out of courses, teams may change mid-intervention, and not every member of a team may choose to participate. In order not to affect/change the instructor's usual teaching method, no requirements have been set on how student groups had to be formed. As a consequence, we did not have any knowledge of how many members of a team would participate: zero,

one, or two or more. When exactly one member participated, they should have had to be in the control group because kind activities would not be returned (i.e., participating team members both being givers and receivers of the kind activities). The latter could also be the case in teams with more than two students, where not all members participated. These were however not excluded in this study, as that would leave too few participants in the experimental condition. In a future study, one may therefore form student groups based on their willingness to participate in this study in order to avoid these limitations. Researchers should however take into account that this method implies that the students will (most likely) know whether their teammates are participating or not, thus impacting the anonymity of and possibly feeling of freedom regarding this choice.

How groups were formed (including assigned group size) and worked together also differed between courses and teams. Both however have an effect on (perceived and actual) teamwork performance (Connerley and Mael, 2001; Mesquita and Lopes, 2018). In self-chosen teams, friends or acquaintances will often choose to work together (Connerley and Mael, 2001). Additionally, friends who work together may sooner be inclined to perform kind activities to each other (e.g., smile to each other, make social plans together), as they already are used to that because of their connection. People who do not know anyone will in self-assigned teams often end up together. Without having sufficient information about their unknown teammate at the start of a course, they risk being a poor fit together: Not only group formation, but also the individual characteristics (e.g., personality, skills/competencies, background) of team members has a high impact on teamwork (e.g., Connerley and Mael, 2001; Rhee et al., 2013; Mesquita and Lopes, 2018; Vinella et al., 2022).

A lack of background knowledge regarding individual schedules (possibly leading to time conflicts) and preferred working method (cooperative or collaborative) may also influence the (perceived) teamwork (Connerley and Mael, 2001; Bravo et al., 2016). If team members split up tasks (i.e., work cooperatively), they may feel less connected, and will be more dependent on their own discipline and ability to communicate. These factors may cause the teamwork scores of these teams to be lower than those of collaborating teams. The latter may value the efforts of team members and their added skills more. However, when the personalities in a team clash, collaborating may give rise to more issues than working apart (Rhee et al., 2013). In such case, splitting up tasks may lead to a higher teamwork score.

In addition to the previously discussed individual and group characteristics, the context of the teamwork is likely to influence the teamwork (Rhee et al., 2013). In this study, many differences existed between the courses, which all could have had an effect on the results. At least the courses differed in their topics, tasks (e.g., design versus programming), language (Dutch or English), teamwork days, deadlines, and use of Blackboard (e.g., what materials, assignments, group membership(s), and grades are (not) put on there). Although the variety of courses increases the external validity of this study, future research is needed to investigate the influence of these environmental factors on the effect of the kindness intervention on teamwork in detail.

Finally, teamwork can be measured in many other ways than looking at perceived teamwork using the Teamwork Scale for Youth (Lower et al., 2017) as in this study. Future studies desiring to investigate the effect on teamwork in more detail can for example make use of the conceptual model from Bravo et al. (2016), and use it to set up an evaluation considering both the perceived

and actual teamwork processes and outcomes. Furthermore, in this study, we considered the perceived teamwork from the perspective of individual team members. Future studies could also ask participants to rate how they perceived the teamwork of another team member (c.f., Connerley and Mael, 2001; Veth et al., 2022) or the team overall (c.f., Bravo et al., 2016).

4.3.5 Limitations of investigating the effect on well-being

Just as perceived teamwork, subjective well-being can have been influenced by many other factors than only the kindness intervention and could also be measured in alternative ways. For example, the effort needed for and performance on course work (Storrie et al., 2010; Linden and Stuart, 2020), the reduced COVID-19 regulations (i.e., less online education and wearing mouth caps in fewer places) and home situations (Linden and Stuart, 2020) might also impact a student's subjective well-being over time. Minor factors, such as immediately filling in the well-being questionnaire after getting a bad/good result back, may also affect the well-being score. However, the Well-being Scale (WeBS) incorporated in this study was found to be valid and reliable, and is thus assumed to be able to handle these small/temporary changes in well-being (Lui and Fernando, 2018).

Alternative ways to measure perceived well-being were already discussed in section 4.1.4 of the methodology. In future studies, other subjective well-being scales may be more suitable than the two subscales of the WeBS included in this study. For example, if researchers are only interested in (part of) the hedonic or eudaimonic well-being, one of the alternatives mentioned before (see section 4.1.4) may be more suitable to incorporate. Furthermore, studies with paid participants could consider to include all subscales of the WeBS (see Lui and Fernando, 2018), because these participants can be expected to be more willing to spend the time to answer all the questions than our unpaid, voluntarily participating students.

Another opportunity for future research is the timing of the subjective well-being and teamwork questionnaire: the positive effect of performing kind activities on perceived well-being diminishes over time. In this study, we chose for a balance between this factor and the flexibility of having a digital intervention by showing the activities and questionnaire to the participants on fixed couples of days (see subsection 4.1.3). Future studies could however also investigate the effects of an inflexible intervention with one fixed day for the activities and one for the questionnaire. Even in this case, still multiple options exist on when to give access to the questionnaire: for example, one can choose to show it the same day of the activities, a day before or after, or exactly in the middle of two days with activities.

4.3.6 Limitations of time and place

This study was conducted entirely in the Netherlands. The geographical location and culture from the participants and surrounding a kindness intervention might however have influenced the results: Although the positive link between kindness and well-being has been found for not only European, but also American and Asian countries (Hui et al., 2020), geographical factors may influence how much a participant gains from a kindness intervention (Lyubomirsky and Layous, 2013). Further investigation is thus needed in this area (Layous et al., 2013, c.f.).

The timing of the kind activities, questionnaires, teamwork and reminders may also have impacted the results of our study. Although limited research has been done yet on how the effect

of kindness on subjective well-being (and teamwork) changes over time, we expect this increase in well-being slowly fades away over time. The more time goes by between performing the acts of kindness and filling in the questionnaire, the smaller the effect thus might be. Not only this changing effect over time needs further investigation, but also whether the moment of performing the acts of kindness is the moment with the highest effect size. Such future investigations should also take into account that recalling kindness also has a positive effect on well-being (see subsection 2.2.1). Filling in a survey on which kindness activities have been done may thus also positively influence the effect size measured at that moment or after.

Similarly, the effect on the teamwork may be dependent on the moment of performing the kind activities. In this study, the participants were asked to perform the kind activities on the day of their teamwork. Whether they performed the acts before, during or after their teamwork on that day may have (had) an influence on the effect of it on their perceived quality of teamwork. Again, future studies are needed to investigate how and to what extent this extraneous factor may have an impact on the results.

Chapter 5

Factors impacting the participation and adherence

5.1 Methodology

In the previous chapter 4, we have reported how we designed, implemented and integrated a kindness intervention effectively into four university courses (see section 4.1.2, subsection 4.1.5 and subsection 4.1.1 respectively). Additionally, we indicated how we planned to perform an online experiment in order to determine the effects of this kindness intervention on the (hedonic and eudaimonic) subjective well-being and (perceived quality of) teamwork of students enrolled in the four courses (see also section 4.1). Due to a low participation rate, we could however only report upon the extent to which students participated and engaged in the study (see section 4.2).

Third and finally, the effectiveness of the intervention design and study around it were therefore evaluated (research question *RQ3*) and reported in this chapter, as already indicated in chapter 1. To investigate the factors impacting the participation and adherence, four focus groups and six interviews were held with students, teaching assistants, lecturers and educationalists. Focus groups had the preference in order to enable gathering a breadth of their opinions and ideas on this topic. If not possible, due to the schedule and availability of potential participants and the researcher, an interview was done instead with an increased in-depth focus on the discussed factors.

The sessions were held on campus or online via Microsoft Teams¹, depending on the preference(s) of the participant(s). The protocol followed (including questions asked) in each session can be found in appendix C.7. The consent form for these interviews and focus groups was the same as that for the interviews with the course coordinators (see Appendix B). Before possible factors were discussed in the focus groups, first the participants were asked to individually write down their ideas on post-its to limit groupthink.

Each focus group was held with four participants, except one where only two participants could make it. The sessions (focus group or interview) took approximately 25 minutes on average. Data was collected by means of the previously mentioned post-its, audio recording with either Soundcorset² (offline sessions) or OBS Studio³ (online sessions), and taking some additional notes. The data was first transcribed using Otter⁴, then analysed with the help of NVivo⁵,

¹<https://www.microsoft.com/en-us/microsoft-teams/group-chat-software>

²<https://soundcorset.com/>

³<https://obsproject.com/>

⁴<https://otter.ai/individuals>

⁵<https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/about/nvivo>

and finally visualized with diagrams.net⁶. The collected data was analysed using the Straussian grounded theory, because this procedure is designed to let a(n assumed subjective) researcher systematically create theories out of qualitative data with room for flexibility and creativity where useful (Kenny and Fourie, 2015). The results of the analysis can be found in section 5.2.

In total, fourteen university students and teaching assistants, and six lecturers and educationalists participated in focus groups with the researcher as a facilitator. The focus groups and interviews were held in English ($n = 2$), unless all participants spoke and preferred Dutch ($n = 8$). The ages of the participants (11 males, 9 females) ranged from 22 to 51 years ($\mu_{age} = 26.7$, $\sigma_{age} = 7.0$).

Students were recruited using not only convenience sampling (in this case, contacting fellow students) but also opportunity sampling in open study areas from the Science Park of Utrecht University. Convenience sampling was also used for the educationalists: all educationalists from Educate-it⁷ were contacted who are associated to research in education (innovation). Teaching assistants and lecturers were recruited using voluntary response sampling: an invitation message was sent in various groups with teachers and other staff members of University Utrecht. The only inclusion criteria in all cases was that they had experience using Blackboard (being as student or instructor), and knowledge about education and research. They were not offered any extrinsic incentives to participate.

5.2 Results

To determine the factors impacting participation in and adherence to the persuasive kindness intervention, we have thus performed focus groups and interviews with students, teaching assistants, lecturers and educationalists. All kind of factors came up about the characteristics of the target participants and involved courses, the context of the intervention, and the design of the kindness intervention and corresponding study. In the Venn diagram (Figure 5.1), the main factors found are shown for the participation level, engagement and retention of the students. Some factors are important for multiple categories, and thus shown in the areas where the circles overlap.

In the next subsections, we will describe and discuss the factors found in each category. Many of them have already been considered in the design of this study or even implemented in some way (think of reminders, rewards, persuasiveness). These are repeated and elaborated upon here, if, as and how they were mentioned by the participants of the qualitative research.

5.2.1 Factors impacting the participation level

In this qualitative study, we found many factors impacting the participation level (research question 3a). Before deciding whether to participate, the students have to become *aware* of the study. Even with an introductory talk in the lectures and announcements via Blackboard and mail, the intervention study might have gone unnoticed for some students. For such introductory talk and announcements, *transparency* and *persuasiveness* is important. Making use of persuasive techniques such as *personalization* of the messages, *authority*⁸ (e.g. by highlighting the Bachelor versus Master student relation, or with the help of a teacher/course coordinator or even education directory), and *playfulness* (e.g., appealing and visual examples) may make students more inclined

⁶<https://www.diagrams.net/doc/>

⁷<https://educate-it.uu.nl/en/educate-it/>

⁸Please be aware that using this method may have ethical implications, but that the participants of this study were not explicitly asked to consider possible negative implications

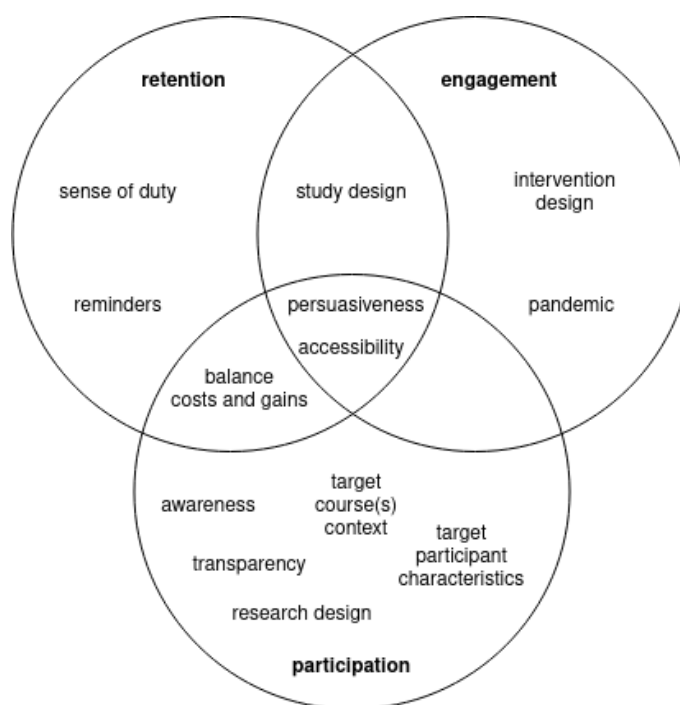


Figure 5.1: Venn diagram with the main impacting factors for the participation level, engagement and retention of the students for the kindness intervention study.

to participate. Similarly, being transparent about the *context and background* and *purpose of the study*, and the *costs and gains of participating* (e.g., time required, length of questionnaires) helps students to make the decision to participate.

Additionally, ensuring a good **balance between costs and gains** of participating, can convince many students. Of course, *rewards* can be motivational, whether they are financial incentives (e.g., gift cards, money, candies, lottery of bigger gifts) or not (e.g., gratification, study credits, bonus points on grade). Clear *added value* in the form of personal (e.g., reward, source of inspiration for kindness, seeing example of Master thesis), peer (e.g., helping out peers, potentially useful for team members, activity with friends) or social (i.e., importance for society) benefits can however also be convincing. Mentioning *prior results* may help to make this added value more clear. To summarize the necessity of communicating the added value, as one of the participants did: "Why would I participate in something I do not think is important?".

Furthermore, the **characteristics of the target participants** themselves are very important for their choice to participate. Their *interest* (in research in general, in the topic of the study, and in the potential results), their *relation with the researcher* (e.g., acquaintance, role model), your *social network* (e.g., participating with friends from your cohort, getting a study association to be involved), and identifying personally with the research or *reciprocity* (e.g., "finding participants is difficult, so you need to help each other") may positively impact their decision to participate. However, getting *too many research invitations* already or being *unfamiliar with research* project (e.g., for introductory Bachelor students) is expected to have a negative impact.

Lastly, if a student decides to participate, the consent form needs to be easily **accessible** in order not to discourage them. Despite the *familiarity* of students with online tools nowadays and

Blackboard being a *main channel for study communication*, a platform as "messy" and as Blackboard (as one of the participants called it) on which information may be hard to find (i.e., bad *user interface*) and with *two-factor authentication*, makes a study on this platform less accessible and may thus have a negative impact on the participation level. Additionally, unfamiliarity with research/questionnaires on Blackboard and students only opening Blackboard when they have a (study-related) reason to, can give the same effect. Blackboard on mobile was also called a struggle for accessibility. Although a *mobile app* exists, many students indicated not to know the existence of it or felt the UI of the app also not to be good. For these reasons, many alternative platforms were suggested which could improve the accessibility: another digital learning environment or education-related communication channel, a kindness intervention app, social media, a questionnaire website, or just mails with links.

Various of the earlier mentioned factors (e.g., relation with the researcher, interest in the study) may depend on the *target course(s) context*. Students in the same program or faculty as the researcher may not only have a higher interest in the topic, but also may sooner participate because of reciprocity and being acquainted with the researcher. Similarly, people from different programs or faculties may be more introvert or extravert on average, which can make them respectively less or more willing to perform (possibly social) kind activities. Furthermore, the use of the digital learning environment may also depend on the course(s) involved and affect the feeling of accessibility as well as familiarity with the research.

Some participants also suggested that changing the *research design* may impact the participation level. For example, a case study with yourself or otherwise family/friends makes the required number of participants lower and thus easier to achieve. Similarly, one could focus on a small group/specific set of target participants makes this number lower, and also gives potential participants the feeling of being of much added value for the study. Another suggestion was to create a critical mass: to plant students who openly (i.e., clearly noticeable) perform kind activities, thereby incorporating Cialdini's principle of social proof (Cialdini, 2008, 2016). One of the participants explained (translated from Dutch): "you have to kind of get the ball rolling, that it then reinforces itself at some point". Involving a study association might help for the latter as well. Finally, one participant mentioned that these interventions often require more time (sometimes even several years) to be successful.

5.2.2 Factors impacting the engagement

Similarly, the participants mentioned various factors which may have had an impact on the engagement (research question 3b). The incorporation of *persuasive techniques*, does not only have an impact on the participation level, but also on the engagement. As for the persuasive techniques, one can use *personalization* of the content (i.e., the acts of kindness) by adapting that to the interests and personality traits of the user/student. Additionally, making the kindness intervention more *playful* by adding game elements (e.g., collecting points for each completed activity, showing achieved streaks) can increase the engagement.

As the students had to open Blackboard to look at the kind activities, perform them, and then again go to Blackboard to fill in the activity test, *accessibility* may have negatively impacted the engagement here as well. According to some qualitative research participants, the *study design*, more specifically the high *length of each questionnaire* or lack of a progress bar, may also have

decreased the engagement of participants. However, most of them did not feel the surveys to be too long, and even liked the use of short sentences and multiple choice questions in them.

The *intervention design* with the assigned acts of kindness in a team environment may also impact the engagement level. The *kind activities themselves* positively impacted the engagement. As one of the (quantitative experiment) participants said: "I did like the activities we had to do". That the sets of kind activities were *assigned* and not for example self-created by the students may have a negative impact: the kind activity may feel fake or insincere in this way.

Letting the participants perform the acts of kindness in a *team environment* could impact the engagement both positively and negatively. Performing the kind activities to team members instead of strangers could increase a feeling of reciprocity and thereby stimulate the participants to be more and more engaged with the intervention. This feeling would however decrease if a student would get the idea that their team members do not act kind (i.e., lack of social proof). Next, in an "unsafe" team environment (e.g., with a lot of friction), a student may less likely perform a kind activity. Similarly, when having been assigned to a group with (to the participant) unknown/random people, performing kind activities can feel unnatural or uncomfortable. A group of friends/acquaintances would not have this problem: they may even stimulate or encourage each other to perform more acts of kindness.

The *pandemic* may also have played a role in the engagement (level) of the participants. Because of a lower *mental strength and well-being*, students had to focus on keeping up their own well-being and might have been less inclined to help others. Additionally, this lower mental strength might have given them the feeling to be exhausted, and thus to have no energy left for additional tasks like kind activities. Furthermore, the pandemic may have caused *social effects*: "on the one hand, people were happy to be socially engaged again, but they also had to get used to it once more". Whereas the first may have increased the engagement in the social acts of kindness, the latter could have had a positive or negative effect. The kind activities may have felt uncomfortable at first (before being used to all social contact again), but they also may have helped in the process of the renewed social contact (especially for introverts).

The pandemic also caused the transition to fully *online* education, which may have had an impact on the engagement. The familiarity with online tools could have a positive effect. However, due to everything being online, screen fatigue was also a common problem. People may thus have felt less inclined to perform/complete non-mandatory/additional tasks whilst online. Furthermore, activities such as interacting/socializing with others online may feel more like a burden and less natural than in real life. Having to perform kind activities online (e.g., when your team has meetings online) could thus decrease the engagement of a participant.

5.2.3 Factors impacting the retention

Last but not least, the participants of the qualitative study indicated a lot of factors which may have affected the retention (research question 3c). The retention is affected by *persuasiveness* and *accessibility*, just like the participation level and engagement. Here, *personalization* in not only the content (e.g., what acts of kindness were assigned), but also in the reminders (e.g., starting with the name of the participant) and other contact metrics (e.g., when the participant has time in their schedule, message directly when they did not do a task) plays a role. In addition, *playfulness* by adding game elements (just as for the engagement) is important, because then the students may

want to keep on 'playing' (i.e., completing the tasks).

Similar to the participation level, the good *balance between costs and gains* plays a role for the retention as well. If a participant of the kindness intervention study feels the tasks indeed require few time and seem to be beneficial to them (i.e., *perceived benefit*), they will be more likely to continue participating. For performing kind activities, the gains in well-being could however be too small to notice ("It [seeing the change afterwards] can be hard to do, I see that.") and reduce or even counteract this effect. The engagement may thus also be improved by making or helping to make the (individual) change or result clear to a participant.

Similar to the engagement, the *study design* may have affected the retention of the intervention participants. First, some lecturers with experience in behaviour (change) interventions mentioned that "dropout is generally high" for them because changing a habit and adopting a new behaviour is hard. Next, the *length of the questionnaire* may have a negative effect (as discussed in subsection 5.2.2), and similarly the *time* each task or activity takes can negatively or positively impact the balance between the costs and gains discussed before. Under- or overestimating the required study load can increase this effect. The long *duration* of the study and a potentially high or over the weeks changing *study load* may also have a negative effect.

Not only the *timing* of the intervention within the course schedule (e.g., no or many deadlines and exams), but also of the *reminders* itself, is important. Reminders received by a student when they have the time to complete the assigned task, helps them to not forget about it and keep up with the activities. As discussed before, being *transparent* about the tasks in the reminder and making it look *attractive* also may encourage the students to complete this new task as well. Putting a clear '*call to action*' in each reminder and sending the reminders via (a/various) *different platforms* can also increase the retention.

Finally, increasing the *sense of duty*⁹ may improve the retention rate. This feeling can be achieved by adding a call to action in messages (both reminders and in-person contact). For example, immediately asking people to sign consent and fill in the first questionnaire after an introductory talk on campus was suggested by various participants. Likewise, the *tone* of the messages can make the tasks (feel) more compulsory for the participants ("You signed up, so now I expect you to perform these activities"). Next, by scheduling a reminder on a *fixed day/time* of the week at for example the start of the lectures/tutorials with teamwork, especially when attending (in person) these moments as researcher, the students may feel a higher sense of duty in addition to not forgetting about the task. By having a fixed moment of doing the tasks, a habit may also more quickly be formed.

5.3 Discussion

5.3.1 Interpretation of results

To compare the factors impacting the participation level, engagement and retention from our qualitative study with those from existing research in the same area (see subsection 2.3.1), we followed the axial coding paradigm with both our codes and the factors mentioned in prior studies (Robinson et al., 2015; Nkyekyer et al., 2021; Shillington et al., 2021, i.e.), resulting in three diagrams

⁹Please be aware that using this method may have ethical implications, but that the participants of this study were not explicitly asked to consider possible negative implications

to be found in appendix D.

The results of this technique showed that many of the participation, engagement and retention strategies encountered are similar to those from prior work. The specifics, however, are often different from our study (e.g., content features, pandemic), or barely indicated in these previous studies. For example, the characteristics of the target participants are reported as potential factor by Nkyekyer et al. (2021), but the characteristics themselves are not that much described. The relation with the researcher, reciprocity in research participation, and (un)familiarity with research are not even mentioned in these works. Similarly, there is a limited reporting in the literature of benefits of participating in a study and ways of community involvement.

As the coding (both the iterations and axial coding) have not been verified by other researchers, these results should be interpreted as preliminary work for future research and not as strict rules. For the same reason, future work is needed to verify the results not only in general, but also the more specific factors found. For example, a literature review on these participation and adherence strategies is required to get a good overview and to show where overlap does (not) exist for different contexts (e.g., kindness interventions versus other health research and behaviour change interventions). Furthermore, the effect of the more specific factors can be determined by performing quantitative research on them in various contexts and various populations (i.e., having different demographics).

5.3.2 Limitations

For this qualitative study, not only various target populations, but also different recruitment and sampling methods have been used in order to obtain a sufficient number of participants. This approach seemed to lead to diverse participant groups and a wide range of factors. Additionally, it gives reason for future studies: To what extent do the factors indicated by (target) participant groups differ from each other? To what extent do the factors indicated by a (subset of) participant group(s) contribute to a lower/higher participation, engagement and retention in practice? How do the results of focus groups differ when inviting only participants from one target population or from different groups?

Furthermore, in this study a combination of focus groups and interviews was used due to both the recruitment issues and time constraints. This approach helped us to get both a broad range of factors and an in-depth understanding of them. Future qualitative studies could make use of this method in a more structured way: Performing the focus groups first and analysing them can provide researchers with the wide range of data. Then, interviews can be held with participants from the focus groups or new participants in order to get in-depth information on the themes in the data found before. Following this method, researchers can thus also validate their interpretation of the previously found results, leading to a higher quality of their study.

In this study, we did not evaluate the factors mentioned by the participants. Incorporating for example *authority* or increasing the *sense of duty* of participants may not be desirable due to expected ethical implications. Before these factors are put into practice, they should thus be evaluated and their (dis)advantages considered. Additionally, we did not investigate the effect sizes of the encountered factors. These effect sizes are however of great importance when balancing the costs and gains of each factor. Future research is thus also needed on this topic.

Chapter 6

Overarching points of discussion

In the previous chapters 3, 4 and 5, we have reported the methodology and findings for each individual research question. Additionally, we interpreted the results, discussed limitations, and provided recommendations for future work specific to that research question (see section 3.3, section 4.3, and section 5.3). In this chapter, we will provide the points of discussion overarching the entire thesis. We will start by summarizing the interpretation of the results. Then we will provide additional, general recommendations for future work. Lastly, we will list the research contributions of this thesis. Afterwards, in the next chapter 7, we will summarize the entire thesis.

6.1 Interpretation of results

The (process and) results of this study indicate that designing an effective kindness intervention requires a lot of thought on many topics. Furthermore, factors such as the encouraging of participation and adherence, and the consequences of choosing a specific platform can easily be overlooked. Some of these findings were in line with prior research, but not all of them. More details on this topic are reported in the discussion sections of the individual studies: subsection 4.3.1 and subsection 5.3.1.

6.2 Recommendations for future work

Next to the recommendations mentioned in the discussion sections of the individual studies (see section 3.3, section 4.3, section 5.3), further research is needed to establish effective kindness interventions for other target participants and other contexts. In order to explore such new contexts and their implications for the kindness intervention, we suggest incorporating the 'reframing' design method formally introduced by Kolko (2010) and described in their book (Kolko, 2011). When reframing, first the current frame is determined. A frame exists of a setting/environment, perspective (i.e., a person/user) and an embodiment. Then the product (i.e., the kindness intervention) is looked at from different points of view, by brainstorming about partly different frames. By having people with a variety of backgrounds and circumstances reframe a kindness intervention via this method, one can thus find not only new, but also innovative perspectives and contexts for kindness interventions.

During this study, various participants already mentioned other target populations to consider. They suggested future studies could look into integrating a kindness intervention for a subset of all students (e.g., with psychological support, from a particular student association), elderly or groups of colleagues in a work environment. Another recommendation proposed by one of the

participants was that future kindness interventions could raise more attention and thereby more support from the community by making participating in it more visible. For example, bracelets visibly associated with the kindness intervention could be handed out to the participants.

Lastly, future work could focus more on the approach taken regarding the intervention design. In this study, we combined aspects from prior kindness interventions (i.e., *theory-based*) into a new one without following a scientific design approach. Prior kindness interventions have also not mentioned the use of such approach (e.g., Ciocarlan et al., 2018; Ciocarlan, 2020; Shillington et al., 2021; Binfet et al., 2021). However, they do exist for general digital health and behaviour change interventions. For example, Fernandez et al. (2019) provided a planning framework for theory- and evidence-based intervention design with guidelines and strategies for its development, adoption, implementation and maintenance.

Morrison et al. (2018) also mentioned the existence of the theory-based and evidence-based approach, and on top of that introduced the person-based approach (similar to User Centred Design)¹. Such person-based approach could for example study and show how people initially respond to the acts of kindness in a kindness intervention, to what extent they already perform them outside the intervention, and (possibly when combined with an evidence-based approach) whether and how a serious game could improve these aspects. After all, participants in our studies already indicated an interest in these topics and wondered about their effects.

Future work in the direction of kindness interventions could investigate the suitability of these approaches for kindness interventions. By following one or more of these standardized and proven to be successful approaches for the design of future kindness intervention, the design approach taken will be more clear and transparent for outsiders and the interventions themselves may even become more effective regarding not only the participation and adherence to them, but also their outcomes. Similarly, investigating the suitability of the generic, standardized approaches of designing interventions - as the ones mentioned before - may also be useful for other specific behaviour change interventions (e.g., interventions to increase outdoor playing activity, interventions to decrease caffeine use).

6.3 Contributions

This thesis has the following key contributions:

- An overview and groupings of kind activities from prior studies;
- An overview and grouping of the kindness interventions from prior studies;
- Initial insights into the factors to keep into account when integrating an intervention into higher education (with teamwork) independent of the content/topic of a course;
- An overview of strategies used by prior kindness studies to make them (more) effective;
- An example of how these effectiveness strategies can be incorporated into a kindness intervention in practice;
- An initial foundation for a highly effective kindness intervention to increase and sustain the subjective well-being of students;
- An example of how an implemented persuasive kindness intervention can be integrated in a course independent of the course content;

¹See also: <https://www.personbasedapproach.org/>

-
- Insights into the (dis)advantages of incorporating a study into the digital learning environment Blackboard;
 - Initial insights into the possible effects of kindness interventions on (perceived quality of) teamwork;
 - An understanding of the importance of defining subjective well-being and kindness in research;
 - An overview of factors impacting participation, engagement and retention in ((kindness) intervention) research.

Chapter 7

Conclusion

Improving the subjective well-being of students has become an increasingly important topic both in research and practice, especially due to it being relatively low compared to other population groups and having been amplified by the COVID-19 pandemic. Kindness interventions have been proven a successful method for this problem and come in all shapes and sizes. This thesis contributes to this research area and the society by investigating how the effectiveness of kindness interventions can be increased regarding their participation and adherence, as well as their effect on the subjective well-being and perceived quality of teamwork of the involved students. By looking at these different aspects both in theory and practice, a full set of guidelines now exists to develop an effective kindness intervention. The guidelines to improve participation and adherence can be applied in other domains as well, because of the breadth of gathered factors.

First, a literature review has been performed to investigate *RQ1* how (in theory) a kindness intervention can be effectively designed, implemented and integrated in regular university courses. Not only have the acts of kindness themselves to be adjusted to their performers, but also their formulation, frequency, number and variety are important. Similarly, the context should be considered as for example group size and formation, and the digital environment influence how the intervention can and needs to be integrated. Subsequently, based on the determined guidelines, a digital kindness intervention has been developed and *RQ2* put to the test regarding its effectiveness in improving the subjective wellbeing and perceived quality of teamwork of students in a quantitative research. Due to a very low participation rate and inconsistencies in retention, no conclusions could be drawn for this research question. Finally, *RQ3* potential factors impacting the participation level, the engagement and retention in this kindness intervention study have been determined via qualitative research. Also for this topic, many guidelines were found to create an effective kindness intervention study. As prior work also indicated, the design of both the kindness intervention and surrounding study, contact metrics, context and target participants themselves all may affect the participation and adherence. The specifics of these factors were however barely indicated in previous work or different from the results in our study (e.g., content features, pandemic).

Further studies are needed to not only investigate in practice and demonstrate the effects of the factors affecting participation and adherence for (kindness) intervention studies, but also to repeat our kindness intervention study following these guidelines. Furthermore, future work could address the knowledge gap of the incorporation of persuasive techniques (including game elements) in kindness interventions, next to peer testimonials and to personality traits personalized

persuasive messages. Finally, future studies can investigate (the potential of) persuasive kindness interventions in other contexts and for other target participants than students in a university.

Appendix A

Kindness intervention design

For the design of the kindness intervention, we made an overview of possible acts of kindness, created sets with control and kind activities to be used in our own kindness intervention, and finally incorporated peer testimonials from Ciocarlan et al. (2018) and Ciocarlan (2020). The results of all these processes are shown in this appendix.

A.1 Tables with possible acts of kindness

In the following tables, all possible, unique acts of kindness encountered during the literature review are shown. Based on the receiver (self or other) and their (in)formality, the kind activities are added to the corresponding table below. In each table, the activities are alphabetically ordered.

Acts of self-oriented kindness	
Act of kindness	Reference(s)
Eat healthy fruit and vegetables	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Exercise, dance and be active	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Go on a short walk outdoors	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Practicing optimism	(Lyubomirsky and Layous, 2013)
Relax by engaging in one of your hobbies	(Ciocarlan, 2020)
Stay hydrated	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Take a deep breath and stretch	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Write a compliment to yourself	(Ciocarlan et al., 2018; Ciocarlan, 2020)

Table A.1: Table with acts of self-oriented kindness found in literature

Formal acts of other-oriented kindness	
Act of kindness	Reference(s)

Donate materials to a charity (e.g., blood, clothing)	(Park, 2019; Hui et al., 2020; Shillington et al., 2021)
Donate money to a charity (formal "prosocial spending")	(Aknin et al., 2012; Hui et al., 2020)
Donate time to a charity (i.e., volunteer work)	(Hui et al., 2020)

Table A.2: Table with formal acts of other-oriented kindness found in literature

Informal acts of other-oriented kindness	
Act of kindness	Reference(s)
Actively listen to someone share their experiences	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Ask someone how they are feeling	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Collaborate with others to create something	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Gift something you made to someone	(Ciocarlan et al., 2018; Ciocarlan, 2020; Binfet et al., 2021)
Gift something nice and sweet you bought (e.g., chocolate, flowers) to people around you (informal "prosocial spending")	(Aknin et al., 2012; Park, 2019; Binfet et al., 2021; Shillington et al., 2021)
Greet a stranger	(Shillington et al., 2021)
Learn something new and teach others	(Binfet et al., 2021; Ciocarlan et al., 2018; Ciocarlan, 2020)
Make social plans together with someone	(Lyubomirsky et al., 2005; Ciocarlan et al., 2018; Ciocarlan, 2020)
Notice the good things in everything around you	(Emmons and McCullough, 2003; Lyubomirsky et al., 2005; Ciocarlan et al., 2018; Ciocarlan, 2020)
Notice the positive qualities of others	(Emmons and McCullough, 2003; Ciocarlan et al., 2018; Ciocarlan, 2020)
Offer a hug to someone	(Ciocarlan et al., 2018; Ciocarlan, 2020)

<p>Offer to do a simple nice gesture for someone</p> <ul style="list-style-type: none"> • Dog sit or walk the dog for someone • Allow someone to go ahead of you in a line • Give directions to someone • Help carry a stranger's belongings • Holding a door open for someone • Offer to help a handicapped or elderly stranger across a street • Picking up dropped materials (e.g., books) • Picking up rubbish • Ushering an emotionally stressed person out of a public (e.g., class) room 	<p>(Ciocarlan et al., 2018; Ciocarlan, 2020)</p> <ul style="list-style-type: none"> • (Park, 2019) • (Hui et al., 2020) • (Hui et al., 2020) • (Hui et al., 2020; Binfet et al., 2021) • (Binfet et al., 2021; Shillington et al., 2021) • (Hui et al., 2020) • (Binfet et al., 2021) • (Binfet et al., 2021) • (Binfet et al., 2021)
<p>Reflect on the good things you are looking forward to</p>	<p>(Layous et al., 2013; Lyubomirsky and Layous, 2013; Ciocarlan et al., 2018; Ciocarlan, 2020)</p>
<p>Reflect on what you appreciate in the world around you</p>	<p>(Emmons and McCullough, 2003; Lyubomirsky et al., 2005; Ciocarlan et al., 2018; Ciocarlan, 2020)</p>
<p>Reflect on what you feel grateful for today</p>	<p>(Emmons and McCullough, 2003; Layous et al., 2013; Lyubomirsky and Layous, 2013; Ciocarlan et al., 2018; Ciocarlan, 2020)</p>
<p>Say thank you to someone who has been kind to you</p>	<p>(Ciocarlan et al., 2018; Ciocarlan, 2020)</p>
<p>Send an appreciation message to someone</p>	<p>(Ciocarlan et al., 2018; Ciocarlan, 2020)</p>
<p>Send compliments to someone</p>	<p>(Ciocarlan et al., 2018; Ciocarlan, 2020; Binfet et al., 2021; Shillington et al., 2021)</p>
<p>Send good wishes to someone</p>	<p>(Ciocarlan, 2020)</p>

Share a funny story or joke with others	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Share something with someone	(Ciocarlan, 2020; Hui et al., 2020)
Smile at someone	(Ciocarlan et al., 2018; Ciocarlan, 2020; Shillington et al., 2021)
Spend time with those friends who feel lonely	(Hui et al., 2020)
Spread kindness by hiding happy messages (e.g., on paper, painted rocks)	(Park, 2019; Ciocarlan et al., 2018; Ciocarlan, 2020)
Talk to someone you have not talked to recently	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Think about what you are grateful for in your (academic or other) work	(Emmons and McCullough, 2003; Layous et al., 2013; Lyubomirsky and Layous, 2013; Ciocarlan et al., 2018; Ciocarlan, 2020)
Volunteer to help someone you know <ul style="list-style-type: none"> • Help acquaintance to move households • Shovelling snow off an acquaintance' driveway 	(Ciocarlan et al., 2018; Ciocarlan, 2020) <ul style="list-style-type: none"> • (Park, 2019; Hui et al., 2020) • (Binfet et al., 2021)
Write a short positive poem or story	(Ciocarlan et al., 2018; Ciocarlan, 2020)
Write a thank-you card to someone	(Ciocarlan et al., 2018; Ciocarlan, 2020; Binfet et al., 2021)
Write an encouraging message	(Park, 2019; Ciocarlan et al., 2018; Ciocarlan, 2020; Shillington et al., 2021)
Write an uplifting message	(Ciocarlan et al., 2018; Ciocarlan, 2020; Shillington et al., 2021)

Table A.3: Table with informal acts of other-oriented kindness found in literature

A.2 Tabular overview with newly formulated acts of kindness

In the following tables, the acts of kindness are shown which are suitable for university students working in teams, and with their new formulations to fit that context (see subsection 3.1.2). The tables correspond to the categories the activities are grouped into (see section 4.1.2). Each week, each student in the experimental group is randomly assigned one of the activities from each of these categories, as discussed in section 4.1.2 as well.

Acts of kindness in the 'Generosity' category		
Subcategory	Act of kindness	Examples (if provided)
Giving	Learn something new and teach/show your team member(s) how it works	Command/shortcut useful for the teamwork/course, few words in a new language
Helping	Offer to do a simple nice gesture for a team member	Getting them a coffee, holding a door open for them, reminding the team to and take a break
Helping	Offer a team member your help with a small task	Writing/sending a mail, checking their writing/coding

Table A.4: Table with acts of kindness in the 'Generosity' category

Acts of kindness in the 'Gratitude' category	
Act of kindness	Examples (if provided)
Reflect on and write down what you appreciate in the team you work with	
Send an appreciation message to your team member(s)	
Think about and write down what you are grateful for in your (team) work for this course	
Write and send/give a thank you note to a team member about their teamwork (when that is suitable)	Hardworking, punctuality, delivering good work, creativity

Table A.5: Table with acts of kindness in the 'Gratitude' category

Acts of kindness in the 'Positivity' category	
Act of kindness	Examples (if provided)
Notice and write down the positive qualities of your team member(s)	
Send good wishes to a team member	Good morning, good luck with ..., have fun doing ..., have a nice day

Share a funny story with your team member(s)	From your own life or from a website like Reddit
Smile at your team member(s)	

Table A.6: Table with acts of kindness in the 'Positivity' category

Acts of kindness in the 'Friendliness' category	
Act of kindness	Examples (if provided)
Ask a team member how they are feeling	
Give a team member a (sincere) compliment but not about their (university/course/team)work	Clothing, positivity, creativity, kindness
Talk to a team member about what (kind of) social plans they like to make	Maybe they like to play some game or eat pancakes

Table A.7: Table with acts of kindness in the 'Friendliness' category

A.3 Peer testimonials

The first week, the following peer testimonials from Ciocarlan et al. (2018) and Ciocarlan (2020) were shown to the participating students in the experimental condition:

- "This study has reminded me of the importance of doing this - It's beneficial to both givers and receivers and I will aim to incorporate this more into my lifestyle"
- "Being nice is nice"
- "[Completing the activities] made me feel happier and more confident"

In the second week, the next peer testimonials were incorporated:

- "This experiment made me realise the beauty of the little things in everyday life. Thank you! I will try to be more kind every day."
- "This study was inspiring"
- "I will try to be a kinder person. It makes other people happy I hope, and it makes me happy too"

In the third and final week, the following quotes showed peer testimonials from prior participants (in Ciocarlan et al. (2018) and Ciocarlan (2020)'s study):

- "Thank you for this great activity, which made me aware of opportunities of kindness"
- "It does make you feel good so even if it's just smiling at someone I am going to make an effort to be more kind in the future"
- "I feel this makes the world a better place and so I will endeavor to follow up on my increased motivation to do kindness activities, having participated in this study"

A.4 Tabular overview with control activities

In the following tables, the control activities are shown. The tables correspond to the categories the activities are grouped into. Each week, each student in the control group would randomly be assigned one of the activities from each of these categories, as discussed in subsection 4.1.2. The control condition was however not performed in the end due to a low number of participants.

Control activities in the 'Food/drink' category
Notice how many drinks you have consumed today
Notice how many meals you have consumed today
Notice how many dairy products you have consumed today
Notice how many water-based drinks you have consumed today

Table A.8: Table with control activities in the 'Food/drink' category

Control activities in the 'Surroundings' category
Notice the closest green object in your surroundings and describe it
Notice the closest blue object in your surroundings and describe it
Notice the closest black object in your surroundings and describe it
Notice the closest white object in your surroundings and describe it
Notice the closest gray object in your surroundings and describe it
Notice the closest brown object in your surroundings and describe it

Table A.9: Table with control activities in the 'Surroundings' category

Control activities in the 'This day' category
Write down in a few words/sentences what you are doing or have done today but without incorporating feelings/emotions/opinions
Write down in a few words/sentences what you are doing or have done this morning but without incorporating feelings/emotions/opinions
Write down in a few words/sentences what you are doing or have done this afternoon but without incorporating feelings/emotions/opinions

Table A.10: Table with control activities in the 'This day' category

Appendix B

Ethical approval materials

In the next sections, the information sheets and consent forms are included for both the interviews with the teachers and the online intervention study for the students.

B.1 Consent form: interviews and focus groups

Integration of a kindness intervention into a university course

Consent form for participation in the research project *Integration of a kindness intervention into a university course*.

Please complete the form below by ticking the relevant boxes and signing on the line below. A copy of the completed form will be given to you for your own record.

- I confirm that the research project **Integration of a kindness intervention into a university course** has been explained to me. I have had the opportunity to ask questions about the project and have had these answered satisfactorily.
- I consent to the material I contribute being used to generate insights for the research project "**Integration of a kindness intervention into a university course**".
- I understand that my participation in this research is voluntary and that I may withdraw from the project at any time (until the point of data analysis) without providing a reason and without any consequences.
- I confirm that I am 18 years of age or over.
- I consent to allow the fully anonymised data to be used for future publications and other scholarly means of disseminating the findings from the research project.
- I understand that the information/data acquired will be securely stored by the researchers and destroyed once the project is completed.
- I agree to take part in the above project **Integration of a kindness intervention into a university course**.

Name of participant		Date	Signature
Name of researcher		Date	Signature

Figure B.1: Consent form used for interviews and focus groups

B.2 Consent form: online intervention study

University intervention integration

Consent form for participation in the research project *University intervention integration*.

Please read the statements below and tick the final box to confirm you have read and understood the statements and upon doing so agree to participate in the project.

I confirm that the research project **University intervention integration** has been explained to me. I have had the opportunity to ask questions about the project and have had these answered satisfactorily.

I consent to the material I contribute being used to generate insights for the research project (**University intervention integration**).

I understand that my participation in this research is voluntary, that it is not a requirement of my course, and that I may withdraw from the research at any time (until the point of data analysis) without providing a reason and without any consequences.

I confirm that I am 18 years of age or over.

I consent to allow the fully anonymised data to be used for future publications and other scholarly means of disseminating the findings from the research project.

I understand that the information/data acquired will be securely stored by researchers and destroyed once the project is completed. I understand the information/data may also be visible to the instructors of the course.

I understand that I can request any of the data collected from/by me to be deleted.

- I confirm that I have read and understood the above statements.

Figure B.2: Consent form used for online intervention study with the students

B.3 Information sheet: interviews with teachers

Integration of a kindness intervention into a university course

Information sheet for participation in the research project *Integration of a kindness intervention into a university course*.

Principal investigator: Evelien van Workum

First supervisor: Ana Ciocarlan

Second supervisor: Judith Masthoff

We would like to invite you to consider participating in the research project *Integration of a kindness intervention into a university course*. Below is some information about the project, to help you decide whether you would like to take part. At the end of the entire research, you may, if you so wish, be informed about the results obtained by means of a debriefing, link to the corresponding report, or presentation.

Taking part in the intervention study is completely voluntary. You may withdraw from the project at any time for any reason.

AIMS

In this work we seek to understand how we can integrate a kindness intervention effectively in university course work. We already have designed the (persuasive) kindness intervention. Now, in this intervention study, we will look at how we can integrate this intervention in the teamwork aspect of your course work.

In the last years, many kindness interventions have been designed and shown to be effective. However, most of them require users/subjects to dedicate a period of time (e.g., a week) specifically for that purpose. By integrating a kindness intervention (without requiring much time) into coursework in this study, we hope to make the intervention not only effective but also easily accessible. Future (research on) interventions may benefit from the collected knowledge, because this study will give them some guidelines on how (not) to integrate a(n) (kindness) intervention in university course work.

WHAT YOU WILL BE ASKED TO DO

The experiment takes places online and can be accessed from any location at your choice. You will be asked various questions about the teamwork in your course. Afterwards, you will be asked to discuss together with the researcher how the intervention could be integrated in your course. The goal of the interview is to come to ideas and if possible an agreement with the researcher about the integration of the kindness intervention in your course.

RISKS

We do not anticipate any risks for participants.

DATA MANAGEMENT AND STORAGE

The data you provide will be stored anonymously on a university repository and it will be destroyed once the project is completed. You may request any of the data collected from you to be deleted.

Figure B.3: Information sheet for interviews with the teachers, page 1 of 2

CONFIDENTIALITY AND ANONYMITY

Raw data and the identity of participants will not be released to anyone outside the research team. Any notes made during the interview will be analysed, taking into consideration or (if agreed) used for the integration of the kindness intervention and may be used for publications, dissertations, reports, or presentations derived from the research project, but will be fully anonymised. Furthermore, the course(s) themselves will also be anonymised as far as possible: at the least, no course names, course codes or specific course descriptions will be used.

CONSENT

If you agree to take part in the research, you will be asked to indicate your consent by ticking a box in the corresponding online Consent Form.

Thank you for considering taking part in this research.

If you have any queries, ask the researcher, or send an email:
Evelien van Workum e.m.m.vanworkum@students.uu.nl

In case of any issues, please contact the thesis supervisor:
Dr. Ana Ciocarlan a.m.d.ciocarlan@uu.nl

Figure B.4: Information sheet for interviews with the teachers, page 2 of 2

B.4 Information sheet: online intervention study

University intervention integration

Information sheet for participation in the research project *University intervention integration*.

Principal investigator: Evelien van Workum

Supervisors: Ana Ciocarlan and Judith Masthoff

We would like to invite you to consider participating in the research project *University intervention integration*. Below is some information about the project, to help you decide whether you would like to take part. At the end of the entire research, you may, if you so wish, be informed about the results obtained by means of a debriefing, link to the corresponding report, or presentation.

Taking part in the intervention study is completely voluntary and is in no way mandatory to pass the course. You may withdraw from the project at any time for any reason.

AIMS

In this work we seek to understand how we can integrate an intervention effectively in university course work. We already have designed the intervention and integrated it in this course. Now, in this intervention study, we will look at the effect of the intervention on subjective well-being and teamwork.

In the last years, many interventions have been designed and shown to be effective. However, most of them require users/subjects to dedicate a period of time (e.g., a week) specifically for that purpose. By integrating an intervention (without requiring much time) into coursework in this study, we hope to make the intervention not only effective but also easily accessible. Future (research on) interventions may benefit from the collected knowledge, because this study will give them some guidelines on how (not) to integrate an intervention in university course work.

WHAT YOU WILL BE ASKED TO DO

The experiment takes places online and can be accessed from any location at your choice. You will be asked to complete a short online questionnaire. Afterwards, you will be presented an online platform where you will be assigned a small number of activities to complete. The activities will consist of simple tasks that you can complete at a location of your choice or using the online platform. Your aim is to complete as many activities as possible. This process repeats for 3 weeks within the time frame of the course. After each week, we will ask you to complete a short follow-up questionnaire about the activities and their effect(s).

RISKS

We do not anticipate any risks for participants.

DATA MANAGEMENT AND STORAGE

The data you provide will be stored anonymously on a university repository and it will be destroyed once the project is completed. You may request any of the data collected from you to be deleted.

CONFIDENTIALITY AND ANONYMITY

Raw data and the identity of participants will not be released to anyone outside the research team and the instructors on the course. Any materials submitted via the

Figure B.5: Consent form for online intervention study with the students, page 1 of 2

webpage of the intervention study will be analysed and may be used for publications, dissertations, reports, or presentations derived from the research project, but will be fully anonymised. Provided student numbers will only be used to ensure each participant gets access to the activities assigned to them personally.

CONSENT

If you agree to take part in the research, you will be asked to indicate your consent by ticking a box in the corresponding online Consent Form.

Thank you for considering taking part in this research.

If you have any queries, ask the researcher, or send an email:
Evelien van Workum e.m.m.vanworkum@students.uu.nl

In case of any issues, please contact the thesis supervisor:
Dr. Ana Ciocarlan a.m.d.ciocarlan@uu.nl

Figure B.6: Consent form for online intervention study with the students, page 2 of 2

Appendix C

Study materials

The study materials themselves (i.e., survey questions, invitation announcement, implementation screenshots) have all been collected in this appendix. The order of the documents is the same as when they are referenced and used in the thesis itself.

C.1 Interview questions

The following questions were used in the 30-minute semi-structured interviews with the teachers of the participating courses about the teamwork in these courses.

1. Does your course use any digital learning environment? If so, which one(s) and is the teamwork also incorporated in this environment?
2. What is the group size of the teamwork in your course?
3. What kind of tasks do the student teams work on? (E.g., programming, writing)
4. When (week(s), day(s), time) are the student teams working?
5. Is the teamwork assessed, and if so how?
6. Does the teamwork have specific deadlines, and if so which?
7. Does the course have other important deadlines without teamwork, and if so which? E.g., midterm exam, final exam
8. When does the teamwork itself start? When and how do the students form teams and get instructions?
9. Do you have any other questions, remarks or feedback about the teamwork involved in your course, or this study in general?

Except for these questions, we discussed the integration and implementation approach as well as the recruitment method for the students with the lecturer(s). The intervention only took place if and after the researcher(s) and lecturer(s) agreed upon these topics.

C.2 Demographics questionnaire

We collected demographics of all students participating in the study. The following demographic questions were asked:

1. What is your student number?
2. To what gender identity do you most identify? (*male, female, non-binary, prefer not to say, prefer to self-describe: ...*)
3. What is your age? (*18-, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30+*)
4. What study program are you following? E.g., Bachelor/Master Information Science, Bachelor/Master Computing Sciences
5. What is your geographical territory of origin? E.g., The Netherlands, Germany, China

C.3 Text-based game: actual persuasiveness of Cialdini's principles

Ciocarlan et al. (2019) designed, proposed and used a text-based adventure game to determine the actual persuasiveness of Cialdini's principles for an individual. In this study, we are only interested in the most persuading principle for a participant. Therefore, we used only the first scenario from Ciocarlan et al. (2019)'s game. The principle to which each option/quest belongs is shown in square brackets, but not indicated to or visible for the participants in the study.

You are an adventurer, arriving in a small village on the edge of the forest. While resting at the inn, you find out that the village is often attacked by various creatures. Before you leave, you decide to offer some help. You must choose which quest to go on next. There are 7 different characters in the village who want your help. All quests are of the same difficulty, and you will receive the same reward for completing them. If you could only help one character, which quest would you choose to go on?

- *The king of these lands would really like you to help this character. [Authority]*
- *You have always admired this character, and you enjoy their company. [Liking]*
- *This character is a travelling merchant who will be leaving tomorrow, so this is your only chance to help them. [Scarcity]*
- *This character has done a favour for you in the past, so now you can help them too. [Reciprocity]*
- *You have already agreed to help this character with another task, so you could help them with this one too. [Commitment]*
- *The majority of those living in this village would like you to help this character. [Social proof]*
- *This character is originally from the same village as you. [Unity]*

The result of this game is then used to determine the persuasive message shown to the participant. Again, these messages (shown below) are similar to those from Ciocarlan et al. (2019).

Reciprocity *Hey! We analysed your data, and we picked these activities especially for you! Will you complete all the activities assigned to you?*

Liking *Hey! Analysing your data, you seem to be a very kind person, and we really like you! Will you complete all the activities assigned to you?*

Social proof *Did you know that the majority of participants in this study complete ALL the activities? Will you complete all the activities assigned to you too?*

Commitment *You are already performing a kind activity by helping the researchers with this study! Will you complete all the activities assigned to you?*

Authority *Did you know that health experts recommend engaging in kind activities to improve well-being? Will you complete all the activities assigned to you?*

Scarcity *You have only four days to engage with these activities! Will you complete all the kind activities assigned to you before the time is up?*

Unity *Hey! You are part of the group of participants who completed the most activities! Will you complete all the activities assigned to you?*

C.4 Blackboard invitation announcement

— Join me and participate in my research! —

Dear students,

During the previous lecture of this course, I talked to you about my research.

As a reminder, and for those who were not there:

In my research, I am investigating how simple activities integrated in a university course can have an effect on your perceived well-being and teamwork.

If you decide to participate in this study, each week (for 3-4 weeks) you will get assigned a few simple activities. These simple activities can be done in a couple of seconds. Examples are 'wave at someone', or 'count the number of glasses in your environment'.

Afterwards, you will be asked to answer a few questions.

If you are willing to spend a few minutes per week to help me out with my study, I would be extremely grateful!

If you can also convince your teammates to participate, even better!

To participate, please read the information sheet and give consent in the 'Research area' (see link added to this announcement in Blackboard).

The activities and short questionnaires will appear in the same Research area.

I hope many of you will participate and help me out, so we can improve the quality of studying together :)

With kind regards,

Evelien van Workum

(Master student Human-Computer Interaction)

C.5 Teamwork and Well-being questionnaire

For the subjective well-being and teamwork questionnaire, we included a survey consisting of both the hedonic and eudaimonic subscales of the Well-Being Scale (Lui and Fernando, 2018) and the Teamwork Scale for Youth (Lower et al., 2017). Figure C.1 shows the questions from the Well-Being scale, Figure C.2 those from the Teamwork Scale for Youth.

Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree
1	2	3	4	5	6
1. I am physically healthy.					
2. I have enough financial resources to meet my needs.					
3. I have enough financial resources to have fun.					
4. I am satisfied with my housing.					
5. I feel in control of my finances.					
6. I feel in control over my physical health.					
7. I am satisfied with my weight.					
8. I have enough energy to do the things I need to do.					
9. I take good care of my physical health.					
10. I plan for the future.					
11. I have someone who knows me well to talk to when I have problems.					
12. I know I can count on my friends and/or family in a time of crisis.					
13. There is at least one person I know who loves me and/or needs me.					
14. I feel confident that I am able to solve most problems I face.					
15. I like my life at home.					
16. I am satisfied with my physical appearance.					
17. I get along with people in general.					
18. I enjoy spending time with friends and/or relatives.					
19. I find time to do things that are fun and interesting.					
20. I believe I have the potential to reach my goals.					
21. I believe that I can make a difference in the lives of others.					
22. Life has meaning for me.					
23. I am satisfied with my spirituality.					
24. I think I am as smart as, or smarter than, others.					
25. I often do things that bring out my creative side.					
26. I like engaging in stimulating conversations.					
27. I try to do things that make me happy.					
28. I feel happy often.					
29. I enjoy life.					

Note. To calculate an overall WeBS score, average scores from all 29 items. To generate a financial well-being subscale score, average scores on Items 2, 3, 4, and 5. To generate a physical well-being subscale score, average scores on Items 1, 6, 7, 8, 9, and 16. To generate a social well-being subscale score, average scores on Items 11, 12, 13, and 18. To generate a eudaimonic well-being subscale score, average scores on Items 20, 21, 22, 23, 24, 25, and 26. Finally, to generate a hedonic well-being subscale score, average scores on Items 27, 28, and 29.

Figure C.1: Well-Being Scale (Lui and Fernando, 2018)

Scale Items	
Item 1: I think that teamwork is important.	Item 6: I make an effort to include other members of my group.
Item 2: People who work in teams can learn more than if they work by themselves.	Item 7: I value the contributions of my team members.
Item 3: I feel confident in my ability to work in a team.	Item 8: I treat my team members as equal members of the team.
Item 4: I know how to give my team members feedback that will not hurt their feelings.	Item 9: I am good at communicating with my team members.
Item 5: I ask others for feedback.	Item 10: I feel confident in my ability to be a leader.

Note. Items 1 and 2 were removed from the final 8-item Teamwork Scale for Youth. The term "team" can be interchanged with "group."

Figure C.2: Teamwork Scale for Youth (Lower et al., 2017)

C.6 Activities in Blackboard

The following screenshot shows an example of an activities test in Blackboard, which could be encountered by a participating student in the experimental condition. The first paragraph of the "Instructions" is shown in the activities tests for both conditions, the second one only for the experimental condition. Although the questions are similar for both conditions, the activities differ both per condition and per person. For more details, please read section 4.1.2.

C.7 Protocol for focus groups/interviews

Focus groups and interviews were held with university people (students, teaching assistants, (assistant) professors, educationalists) to provide insight into what factors may have affected the number and activity of participants in the kindness intervention study. The next protocol was followed for these focus groups and interviews:

1. **Introduction**
2. The researcher asked candidate participants to help them out for about 15 minutes, and shortly told them the aim of the study: "I have had some problems with the number of participants and their activity in my original experiment, and I am trying to find out why."
3. Then, the researcher officially greeted the participant (group) and asked if they could all - if they agreed to - sign the consent form and write down their age and gender. Additionally, the researcher explicitly asked permission to take an audio recording of the session: only if all participants also explicitly agreed, audio was recorded. Otherwise, the researcher took notes during the meeting.
4. Next, the researcher explained to the group what a kindness intervention is: "In a kindness intervention, you ask participants (in my case students), to perform some kind activities on a specific day/week. Kind activities are for example thanking someone else or greeting a stranger."
5. The researcher elaborated upon what the kindness intervention being investigated involves:

Preview Test: Research - Activities week 1 (k)

Test Information

Description

Instructions Please perform (as much as possible of) the activities below on a day when you are working on the teamwork for this course, but **before Thursday 23:59**. The activities have to be performed **on one day**, and not spread out over multiple days. In this test, we ask you to indicate which of the activities you have performed on what day. Upcoming Friday, the second short survey will appear online for you to fill in.

Before performing the activities we assigned to you, please read these quotes from people who participated in similar studies previous years:

- "This study has reminded me of the importance of doing this - it's beneficial to both givers and receivers and I will aim to incorporate this more into my lifestyle"
- "Being nice is nice"
- "[Completing the activities] made me feel happier and more confident"

Multiple Attempts This test allows multiple attempts.

Force Completion This test can be saved and resumed later. Your answers are saved automatically.

Question Completion Status:

QUESTION 1 0 points Save Answer

On which day of the week are you performing or did you perform the activities?

Monday

Tuesday

Wednesday

Thursday

None

QUESTION 2 0 points Save Answer

Talk to someone about what (kind of) social plans they like to make
e.g., maybe they like to play some game or eat pancakes (with friends/family/colleagues outside of work)

True

False

QUESTION 3 0 points Save Answer

Offer a team member your help with a small task
e.g., writing/sending a mail, checking their writing/coding

True

False

QUESTION 4 0 points Save Answer

Write and send/give a thank you note to a team member about their teamwork (when that is suitable)
e.g., hardworking, punctuality, delivering good work, creativity

True

False

QUESTION 5 0 points Save Answer

Smile at your team member(s)

True

False

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Save All Answers Save and Submit

Figure C.3: Screenshot of an activities test

- "My kindness intervention study had three main phases: the recruitment of participants, the design of the kindness intervention, and the implementation of the kindness intervention study in Blackboard."
 - "The potential participants were presented with an introductory talk, later an announcement mail via Blackboard and finally a reminder mail. They had two weeks to sign-up via a Blackboard form. In the introduction, they were told the study consisted of performing a few simple kind activities and answering some questions for three weeks. About 2% of the potential participants signed up."
 - "During the two sign-up weeks and after signing up, they were asked to fill in a demographic questionnaire and answer some first questions. Less than 50% of the participants answered the demographics and presumably none the first survey. Then, the three weeks with the activities and surveys followed."
 - "Let me show you some examples of the kindness intervention implementation in Blackboard, how it looked like for the participants."
6. Afterwards, the participants could ask questions - if they had any - to enhance their understanding. Then, the researcher reiterated the purpose of this focus group once more: "With your help, I aim to find out what factors impact engagement/participation and adherence in this kindness intervention study."
 7. **Actual questions**
 8. First, the participants were asked to individually write down in keywords on post-its what factors would negatively/positively impact their engagement/participation level with this kindness intervention study. When everyone was ready, all responses were discussed within the group (i.e., the participants were asked to explain what they previously wrote down and the other participants were asked to what extent they agreed with it).
 9. Next, the participants were asked by the researcher whether they can think of more factors, now they have seen and heard those of others (insofar this had not happened yet in the meantime). Keywords derived from these responses were also written down on post-its.
 10. Then, the participant (group) was asked by the researcher to discuss any adjustments that could improve the kindness intervention study. If the conversation did not start automatically, the researcher mentioned negatively impacting factors from before.
 11. Finally, the researcher reminded the participants of the issues the participants mentioned and asked them which of these they would see as most important to adjust/improve and why.
 12. **Wrap-up**
 13. The researcher thanked the group/interviewee for their participation, asked if there were any final questions or remarks, and closed the session.

Appendix D

Interpretation of results

After the investigation regarding the factors impacting participation, retention and engagement in the kindness intervention study, we placed the results in the context of prior work in the same field (see section 6.1). Following the axial coding paradigm, we created three diagrams as well as an overview with all (sub)categories in these diagrams containing codes from both our and previous studies. The bold codes in these diagrams are mentioned in prior literature, the italic ones resulted from our study. When the same concept was given another code in prior research than in our research, we followed the codes from the prior research.

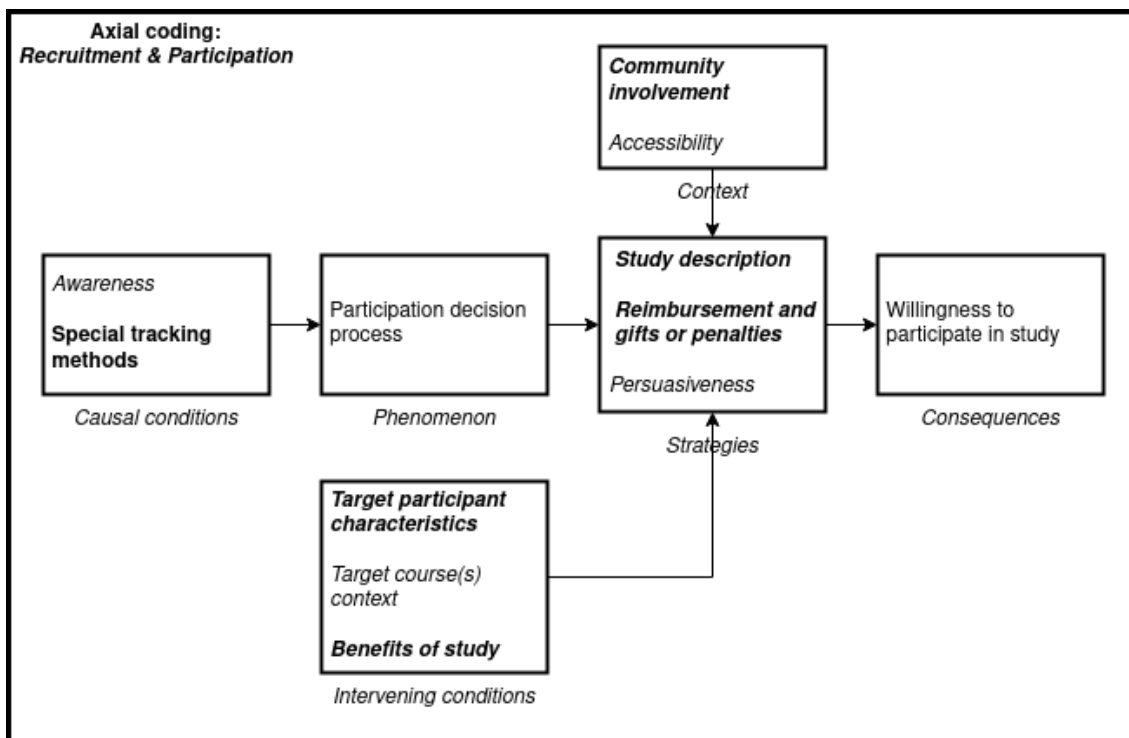


Figure D.1: Axial coding framework on the factors impacting the participation level in the kindness intervention study

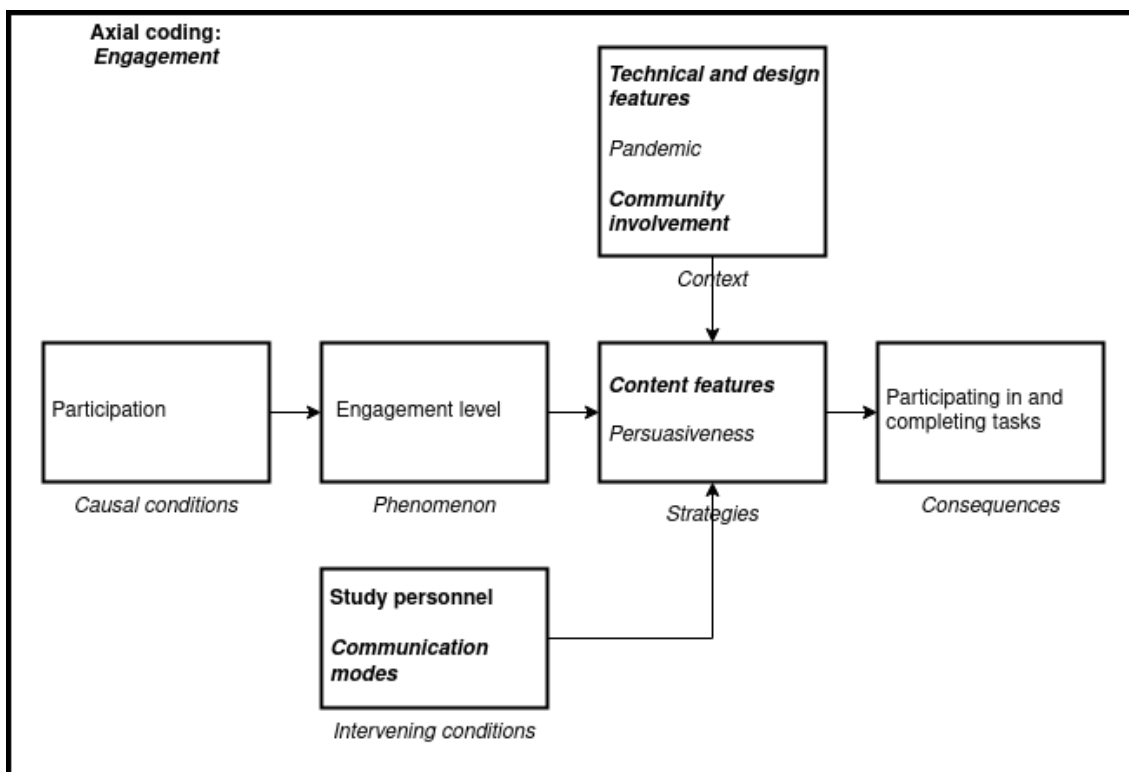


Figure D.2: Axial coding framework on the factors impacting the engagement in the kindness intervention study

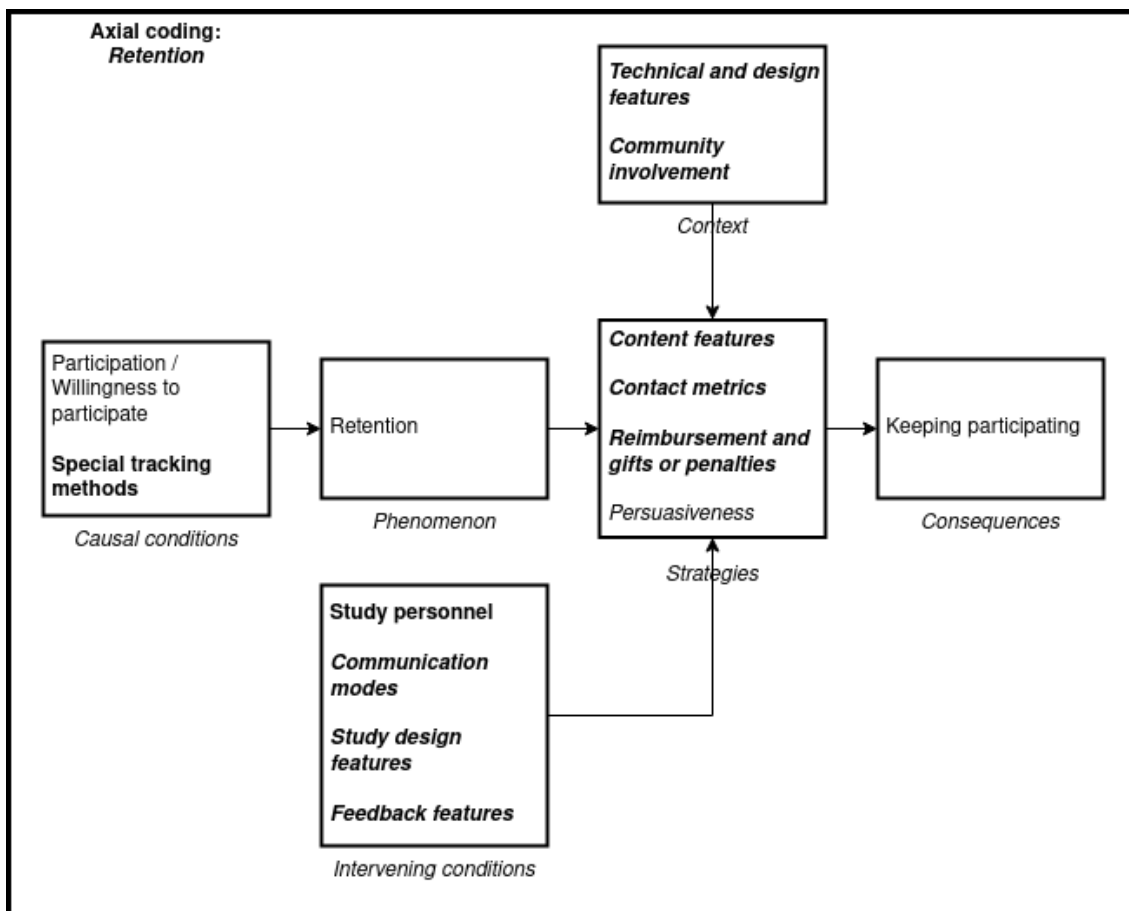


Figure D.3: Axial coding framework on the factors impacting the retention in the kindness intervention study

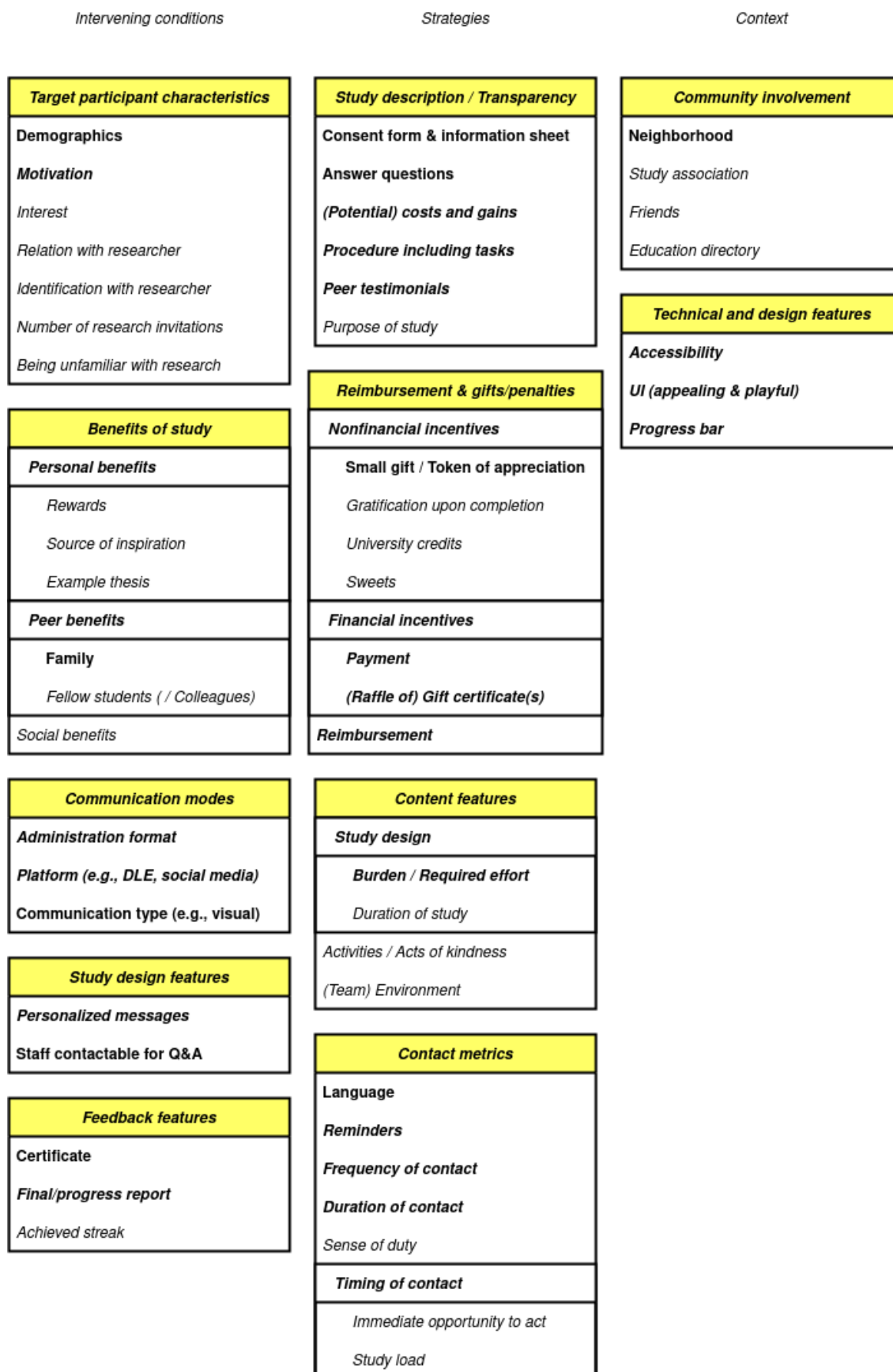


Figure D.4: Overview of the (sub)categories in the axial coding frameworks on the factors impacting the participation, engagement and retention in the kindness intervention study

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