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Structured Abstract:

Purpose

Different length of collaboration with colleagues at work is a central feature of modern working life, and even more so in a work environment that is increasingly project focused and knowledge-intensive. Despite its practical importance there is little research on how the perceived costs and benefits in an information-sharing dilemma might change depending on collaboration length. Based on a social dilemma framework it is hypothesised that anticipated length of collaboration time will significantly influence the motivation to collaborate.

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An experimental scenario study (N=87) compared the willingness to work collaboratively, share information and help the partner in a long-term (two academic terms) vs. a short-term (one week) condition.

Findings

At first somewhat counterintuitively, participants were more helpful in the short-term, and insisted more on equality and disengaged more from a defecting partner - but not the project - in the long-term condition. People appear to focus more on the immediate task in short-term collaborations — even at cost — because the outcome is more important than the relationship, and more on setting norms for equality and reciprocity in long-term collaborations to avoid future exploitation.

Practical implications

The findings help understanding the motivation and the partner and task perception under different time conditions and support managing teams in an increasingly project-oriented work environment with changing partners and varying time frames.

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To the authors' knowledge, this is the first paper investigating the influence of anticipated collaboration time in information-sharing dilemmas.

Keywords: time, information-sharing, cooperation, social dilemma, reciprocity, helping, work dyads

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For internal production use only

Running Heads:

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Time is absolutely fundamental to human existence. It structures everyday actions, and fundamentally shapes social interactions with others, both anticipated and present, as well as the perception of past interactions. In Roe's words: "...no form of behaviour could possibly [be] defined without reference to time" (2008, p. 37). Every individual and every group acts in the light of its own specific history and even future events have an impact on present behaviour (Nuttin, 1985). Over time, teams and dyads develop norms, experience events that shape their structure and identity, and influence and are influenced by the behaviour and attitudes of their members. Entire organisations are shaped by the life span of collaborations, both in face-to-face and virtual contexts (Saunders & Ahuja, 2006, Bakker & Knoben, 2015). Despite its importance, the effects of time on work collaborations have been neglected in past research (Blount, 2004; Gersick, 1988; McGrath, 1991; Mohammed, Hamilton & Lim, 2009).

This paper addresses an important gap in previous studies by focussing on the anticipation of collaboration time and its influence on information-sharing in dyadic interactions. It is hypothesized that the mere anticipation of shorter or longer collaborations already casts a 'shadow of the future' on how collaboration partners and the costs and benefits of information-sharing are perceived and hence lays the ground for all future interactions. Dyads are the smallest organisational units for information-sharing and central to interactions both within teams and the wider organisation. Information has become one of the central organisational assets in a knowledge-intensive economy, but is still an under-research topic in the management of teams. A social dilemma framework is proposed to study how the anticipated collaboration time might affect the attitude towards collaborating, sharing information and helping a collaboration partner.

Time and Cooperation in Social Dilemmas

Social dilemmas are, generally speaking, situations where there is a (potential) conflict between individual and collective interests. In Axelrod's famous prisoner's dilemma game study (1984), he identified three requirements for cooperation, one being an on-going relationship. According to Axelrod, "[t]he future can therefore cast a shadow back upon the present and thereby affect the current strategic situation" (1984, p. 12). Thus, in one-shot prisoner's dilemma games cooperation was only rarely observed (Orbell & Dawes, 1993; Palfrey & Rosenthal, 1994). A more recent review of step-level and continuous public good games, however, found mixed effects (Abele, Stasser & Chartier, 2010) with a decrease of cooperation in continuous games over time (Ledyard, 1995), and both an increase in cooperation (Bagnoli & McKee, 1991) as well as a decrease over time (Suleiman & Rapoport, 1992) in step-level games. Outside the laboratory, there is evidence that cooperation increases if there is a greater probability of a continuing relationship (Bó, 2005; Murnighan & Roth, 1983). For instance, Heide and Miner (1992) found supporting evidence for a positive relation between the duration of interactions and the level of cooperation in a survey study among 136 industrial buyers and sellers. A study using a monetary social dilemma task found that anticipated future interactions increased cooperativeness, and significantly more so for participants with an individualistic rather than a prosocial orientation (Van Lange, Klapwijk & Van Munster, 2011).

The rationale behind this type of conditional cooperative behaviour is that people fear to lose the cooperation of their partner in the future if they defect in the present. A joint future offers the possibility to reward or sanction others' behaviour and to build up one's reputation as a cooperation partner. Thus, the threat of future retaliation affects decisions in the present and deters players from defecting. Formal mathematical analyses support this (Fudenberg & Maskin, 1990; Radner, 1986), and simulations with multi-trial dilemmas reveal that "tit-for-tat" captures participants' behaviour best (Axelrod, 1984).

Although repeated dilemma games are thought to model real-world situations such as continued exchange in long-term work relationships, they lack the multidimensionality of real cooperation because they tend to only consider monetary contributions. Cooperation, however, has multiple facets such as the willingness to share problem-solving strategies or exchange information (Heide & Miner, 1992). In fact, the extent to which knowledge is effectively exchanged is important for the successful functioning of teams as well as organisations. In addition, real-world interactions go beyond the mere distinction of defection vs. cooperation but include behaviours such as helping others, sharing information or compensating for less experienced partners. A recent postulate in social dilemma research thus has been “to incorporate features of the real-world dilemma into the game” (Abele et al., 2010, p. 397).

Length of Collaboration Time

Several terminologies have been used in previous research to capture the effects of time on attitudes and behaviour. “Time perspective” was first proposed by Nuttin (1985) to describe the cognitive representation of a sequence of events, for example, repeated interaction or future collaboration, as opposed to the term “time perception” which describes the subjective perception of time such as duration. Time perspective matters as “future [...] events have an impact on present behaviour to the extent that they are actually present on the cognitive level of behavioural functioning” (Nuttin, 1985, p. 54). In this respect, time perspective differs from the understanding of time in the social dilemma studies reviewed above where usually a single interaction (a so-called one-shot) vs. repeated interactions are compared within one laboratory session. Time perspective, in contrast, relates to the temporal aspects of collaborations and their impact on attitudes and behaviour and comes closest to the scope of this study about the effects of anticipated collaboration time.

Previous studies found that time perspective can impact on decision-making and behaviour, for instance, that a future time perspective can help a person to “transcend

[immediate] stimulus forces” (Zimbardo & Boyd, 1999, p. 1272), and to delay gratification. A study on attitude-behaviour consistency showed that consistency increased if a distant-future (long-term) time perspective was present as compared to only a near future (short-term) time perspective for attitudes and behaviours regarding environmental protection and saving money (Rabinovich, Morton & Postmes, 2010). Another study on creative project teams found that teams with a relatively shorter time perspective focused more on the immediate present and task completion rather than on task elaboration compared to teams with a longer time perspective (Bakker, Boros, Kenis & Oerlemans, 2013).

The Shadow of the Future in Information-Sharing Dilemmas

This paper aims to extend existing research by using a social dilemma framework to understand how the anticipation of short vs. long-term collaboration affects the perception of costs and benefits in an information-sharing dilemma. The study used a typical student task scenario for dyads¹ that included writing a term paper and making a presentation (Moser & Wodzicki, 2007) and represents an information-sharing dilemma that is mapped closely to real world experiences of the student participants. It included central cooperation behaviours like help-seeking with high costs for the co-operator and used time frames that mirrored realistic life spans of typical project work (one week vs. two academic terms). Most previous social dilemma research investigated only one-shot vs. repeated interactions within one lab-session which tends to give the interaction a “game character” that is quite different from actual collaborations in a work context. The lab studies have an inherent bias towards a short-term time perspective even in repeated games because the experiment takes place within a limited time on the same day. Lastly, the study used an information-sharing dilemma instead of monetary contributions because information is a central ‘currency’ in a knowledge-

¹ In line with a long-standing tradition in social psychology dyads are understood as simple groups as they are the smallest possible unit where interaction between individuals occurs (Thibaut & Kelley, 1959). Dyads are central units of interaction at work, often as part of larger groups.

intensive work environment but still under-researched (Moser, 2009; Steinel, Utz & Koning, 2010).

Sharing information is a classic public goods dilemma (Dawes, 1980). From a collective perspective, it is highly desirable that individuals share task-relevant information with collaborators. However, from an individual perspective it is ambiguous as it can entail status gains (as expert or team player) and public rewards (Ardichvili, Page, & Wentling, 2003; Cabrera & Cabrera, 2002), but there are also significant costs involved in acquiring knowledge. And, once the information is shared, it can be used by anyone regardless of whether they contributed to acquiring the knowledge or not. Thus, individual contributions might get lost in the overall group performance and this can increase the risk of free-riders—individuals who profit from the information but do not make any efforts to provide information themselves. Thus, sharing information poses a social dilemma between individual and collective interests, which can undermine effective information-sharing (Connolly, Thorn, & Heminger, 1992; Cress & Kimmerle, 2007; De Cremer & Bakker, 2003; Moser & Wodzicki, 2007; Sanna, Parks, & Chang, 2003; Weber, Kopelman, & Messick, 2004). Based on previous research, it is hypothesized that the anticipation of long vs. short-term collaboration times has significant effects on the willingness to cooperate:

Norms of equality and reciprocity: Participants are more likely to insist on equal contributions if the partner defects in the long-term compared to the short-term condition (H1a). The reasoning behind this is that they want to set a norm of equality and reciprocity in long-term relationships to avoid being exploited in the future, which could be very costly. At the same time they want to stay cooperative themselves to ensure the long-term cooperation of their partner. This may go as far as compensating for a defecting partner and or showing at least conditional cooperation (H1b). There is less danger of exploitation in short-term relationships, simply because there is less opportunity to free-ride, but also to retaliate if the partner is uncooperative, so norm setting is expected to be less important.

Helping the partner: Every well-functioning group or organisation depends on the helpfulness of its members, for instance to integrate newcomers. This presents a dilemma situation with very high costs. Not only has the helper more experience and knowledge to which the other contributed nothing, but the helping itself also requires time and effort. It is hypothesized that participants are more likely to help in the short-term and more likely to punish a help-seeking partner in a long-term relationship through withholding help (H2). The reasoning behind this is that in short-term relationships helping and the costs associated with it are limited investments. In the interest of getting the task done, people may agree to help because in the short-term, the outcome (e.g., the grade received) is more important than the additional investment. In the long-term condition, a lower willingness to help is expected because people do not want to appear easily exploitable, but also because it is realistic for the partner to learn and acquire expertise. Participants are therefore more likely to focus on the equality in the exchange relationship and less on the immediate outcome.

Defecting and free-riding: Participants are expected to be more likely to take advantage of a cooperative and helpful partner in the short-term than in the long-term condition (H3). The reasoning behind this is that in the short-term condition there is little time to get the task done (so all contributions are welcome), but also little opportunity for retaliation. In the long-term condition there is the risk of losing the partner's cooperation and being punished for free-riding, but there is also enough time to go down the 'lonely wolf' route.

Social value orientation: Social value orientations (SVO) are usually defined as stable preferences for certain patterns of outcomes for oneself and others (Van Lange et al, 2013). The two main types of SVO are prosocials who want to maximize joint outcomes or achieve equal outcomes, and proselfs who focus on self-interest goals or a relative advantage over others and expect a similar behaviour of their interaction partners. Prosocials are consistently more cooperative than proselfs. Proselfs, on the contrary, are more likely to

make self-benefit choices and tend to cooperate only if they are given external incentives (Bogaert et al., 2008) or if their group identity is made salient (De Cremer & Van Dijk, 2002). A long-term time perspective might act as such an incentive for cooperative choices, because anticipated future interactions offer the possibility of sanctioning or rewarding current behaviour. A long-term time perspective is expected to incentivise cooperation especially for proselves whilst prosocials should generally exhibit a higher level of cooperation (H4), regardless of time perspective (Van Lange et al., 2011).

Method

Participants

One hundred and thirteen undergraduate psychology students from a UK university (mean age 20.3, $SD = 5.4$, 3 missing), 96 of them women, completed the on-line experiment. The experiment lasted approximately 25 min, and participants were compensated with credits for fulfilling study requirements.

Task and Procedure

The experimental task was a student work group scenario adapted from Moser and Wodzicki (2007) and was to imagine working in pairs on a compulsory course project involving literature research, writing a term paper and making a presentation in class. Collaboration time was manipulated between subjects: in the one week condition (short-term), participants were instructed that it was already towards the end of the academic term, that they only had one week to complete the assignment and that there would be no further group work in the following term. In the two academic terms (long-term) condition, participants were told that they had the entire term to complete the assignment and that they would again work together on a subsequent project with the same partner in the following term. The students were enrolled in different programmes with both shared and separate modules, so that both the long- and short-term conditions were realistic in their study context.

After the general introduction to the on-line experiment and the consent form and prior to the experimental manipulations, participants' social value orientations were assessed. Then, participants were randomly assigned to one of the two experimental conditions and read the respective scenario texts informing them of a short-term or long-term collaboration, respectively. Subsequently, they answered the manipulation check and the preferred working style items. Then, participants were confronted with scenario descriptions of defective, help-seeking or cooperative behaviour of their partner across different task contexts and asked for their reactions (see below), which were used as dependent variables. Additional items measured importance of outcome and past work group experience.

Manipulation Checks

The manipulation check consisted of two items: "The group assignment comprises only one week. There will be no further group work" (short-term) and "The group assignment comprises one term. I will work together with my partner again on another group project next term" (long-term). 87 participants completed and correctly answered the manipulation check and were included in the analyses.

Measures

Preferred working style. This aimed to assess participants' general preference before being influenced by scenarios of their partner's behaviour. It consisted of two items: "I prefer to work alone on both the presentation and the paper" (non-cooperative) and "I prefer to work jointly with the other student on both, the presentation and the paper" (cooperative).

Cooperation scenarios. Subsequently, participants read short descriptions of specific situations in which the partner either showed defective, cooperative or help-seeking behaviour:

Defection of partner: You have decided that each of you will summarise one of the articles until the end of the week (long-term) / until the next day (short-term). However, you receive no summary from your partner. What do you do?

Help-seeking of partner: Your partner asks you for help because she/he had difficulties with a text. You would have to familiarise yourself with the text, which is different from your own sub-topic. This would take up valuable time, which you need for your own work. What do you do?

Cooperation of partner: Your partner starts forwarding you many articles that are relevant for your sub-topic. How do you react?

Cooperation intention items. The different reactions used a six-point scale (1 *strongly disagree* to 6 *strongly agree*) and consisted of the following options:

Equality norm: I would insist that he / she writes the summary.

Conditional defection: I would reduce my effort as well.

Compensation: I would increase my efforts in order to compensate for his / her lack of effort.

Conditional cooperation: I would only get involved as far as I can benefit from the collaboration for my own sub-topic and my part of the presentation.

Disengagement: I would concentrate working on my part of the presentation so that at least my part is of high quality.

Full cooperation: I would do the same with my articles.

Full defection: I would ignore the articles and search for articles on my own.

Helping: I would take the time to familiarise myself with the text, but only go through the most important problems, so to lose not too much time.

Social value orientation. Social value orientation was assessed with the Decomposed Game Measure (DGM; Van Lange, De Bruin, Otten & Joireman, 1997). The DGM consists of nine items, each containing three pairs of outcome distributions for oneself and an unknown other, and each representing a particular orientation (prosocial or proself). Respondents are required to select one of the three pairs for each item. When respondents choose at least six

pairs with the same outcome distributions, they are classified accordingly. If less than six choices are made for one distribution, the participant remains unclassified.

Regarding SVO, 45 could be classified as prosocials, 16 as proselfs, and 26 could not be classified which resulted in a final sample of 61 participants (with $n = 15$ prosocials and 8 proselfs in the short-term condition, and $n = 30$ prosocials and 8 proselfs in the long-term condition). Strength of relationships between variables did not change significantly when the original sample was reduced to 61 participants.

Past work group experience. This was measured with two items after the scenario task was completed (e.g., “Until now, I had rather positive experiences with group work.”), using the mean value.

Importance of outcome. The importance of outcome (Gärling, 1999; Shamir, 1990) was assessed with one item: “In the described case, a good or very good mark would be very important to me.”

All items used a six-point scale (from 1 *I strongly disagree* to 6 *I strongly agree*).

Inter-correlations between all measures are shown in Table 1.

(Insert Table 1 about here)

Results

First, distributions of preferred working style, SVO, past group experiences, and importance of outcome for both experimental groups were checked across conditions. 39 out of 61 participants (63.9%) preferred working jointly with the partner, with no difference between the two time conditions, $\chi^2(1, n = 61) = .03, p = .87, odds\ ratio = 0.92$. Also no significant differences were found for SVO (15 of 23 participants in the short-term and 30 of 38 participants in the long-term condition were classified as prosocial, $\chi^2(1, n = 61) = 1.40, p = .24, odds\ ratio = 0.50$), for past group experiences ($M = 4.05, SD = 1.22, t(44) = 0.71, p = .48, d = 0.22$), and for importance of outcome ($M = 5.54, SD = .54, t(59) = 0.71, p = .48, d = 0.19$) between conditions.

Overall, average ratings indicated rather positive past group experiences, a high importance of outcome, a preference for working jointly and a ratio of approximately two thirds to one third for prosocials to proselfs, which is in line with previous research (Van Lange et al., 2011). With no significant differences between the two experimental time conditions for these control variables all further results below can be interpreted as effects of long- vs. short-term collaboration times.

Analyses of Variance of Collaboration Time and Cooperation Intentions

To test for the effect of collaboration time on cooperation intentions, a multivariate analysis of variance (MANOVA) was performed with equality norm, conditional cooperation, disengagement, conditional defection, compensation, helping, full cooperation and full defection as dependent variables (for mean values see Figure 1). The MANOVA showed an overall significant effect of collaboration time across all cooperation intentions, Wilks' $\Lambda = .74$, $F(8, 52) = 2.28$, $p = .04$, $\eta_p^2 = .26$. Further univariate tests are presented separately below.

(Insert Figure 1 about here)

Partner defects. Confirming hypothesis H1a, participants insisted more on equal contributions from the partner for literature summaries in the long-term compared to the short-term condition ($t(59) = -2.02$, $p = .05$, $d = 0.51$; equality norm). When the partner defected in preparing for the class presentation, participants in both conditions were still willing to employ a conditional cooperation strategy, $t(59) = 0.72$, $p = .48$, $d = 0.19$ (conditional cooperation). Similarly, the partner's defection when preparing the term paper led to participants compensating for this in both conditions, $t(59) = 1.03$, $p = .31$, $d = 0.27$ (compensation). Lastly, participants in both conditions were equally likely to disengage from a defecting partner (but not the project), $t(59) = -0.67$, $p = .51$, $d = 0.40$ (disengagement), but did not defect themselves, $t(59) = -1.17$, $p = .25$, $d = 0.33$. This seems to reflect the overall

importance of marks regardless of collaboration time and the preference for working collaboratively, and only partly confirms hypothesis H1b.

Partner seeks help. Fully consistent with H2, participants were more likely to help their partner in the short-term than in the long-term, $t(59) = 3.58, p = .001, d = 0.98$ (helping).

Partner is cooperative. Overall, participants were highly likely to reciprocate with full cooperation. Contradictory to H3, participants were more likely to fully reciprocate by also sending articles to the partner and less prone to withdraw in the short term than the long-term collaboration (full cooperation: $t(59) = 2.62, p = .01, d = 0.73$; full defection: $t(59) = -2.25, p = .03, d = 0.61$).

Preferred Working Style, Past Work Group Experience and Importance of Outcome

Additional MANOVAS with work style preference, past group work experience and the importance of outcome as covariates showed no significant results for any of the three controls (past work group experience, Wilks' $\Lambda = .82, F(8, 34) = 0.95, p = .49, \eta_p^2 = .18$; preferred working style, Wilks' $\Lambda = .75, F(8, 34) = 1.43, p = .22, \eta_p^2 = .25$; importance of outcome, Wilks' $\Lambda = .78, F(8, 34) = 1.17, p = .34, \eta_p^2 = .22$). However, univariate analyses revealed that for conditional cooperation past group experience was a significant covariate, $F(1, 41) = 8.64, p = .01, \eta_p^2 = .17$, and the importance of outcome was a significant covariate for full defection, $F(1, 41) = 5.99, p = .02, \eta_p^2 = .13$. As shown in Table 1, preference for working collaboratively correlated negatively with conditional cooperation ($r = -.36, p = .01$) and full defection ($r = -.27, p = .03$), and positively with past experiences of group work ($r = .39, p = .01$). This was the only significant correlation of past work group experiences with any of the other variables. There was no significant correlation with importance of outcome with any variables.

Social Value Orientation

There was no significant interaction between collaboration time and SVO, Wilks' $\Lambda = .90, F(8, 50) = .71, p = .69, \eta_p^2 = .10$, but there was a main effect of SVO on overall

cooperation intentions, Wilks' $\Lambda = .76$, $F(8, 50) = 1.99$, $p = .07$, $\eta_p^2 = .24$. Participants were generally very cooperative with very low ratings for full defection ($M_{\text{total}} = 1.69$, $SD = 0.87$), and with relatively lower ratings by prosocials ($M = 1.58$, $SD = 0.78$) than by proselves ($M = 2.00$, $SD = 1.03$), $F(1, 57) = 3.44$, $p = .07$, $\eta_p^2 = .06$. Further univariate tests revealed that, consistent with their preference for equal outcomes, prosocials insisted more on equality norms when the partner defected than proselves, $F(1, 57) = 6.50$, $p = .03$, $\eta_p^2 = .08$, and were more willing to cooperate fully when the partner cooperated, $F(1, 57) = 3.22$, $p = .08$, $\eta_p^2 = .05$. They did not, however, differ in their support for a help-seeking partner, $F(1, 57) = 0.01$, $p = .93$, $\eta_p^2 = .00$, thus confirming the higher level of cooperation for prosocials (H4), regardless of collaboration time.

(Insert Figure 2 about here)

Discussion

Time fundamentally shapes our lives and influences how we perceive others and interact with them. This paper addresses the still under-researched influence of anticipated collaboration time in information-sharing dilemmas. Sharing information is central for organizational success in a knowledge-intensive work environment but often fails because of motivational obstacles. One such obstacle may be the differently perceived costs and benefits of information-sharing depending on the length of collaboration time.

The current study addressed gaps in previous research in several respects: (1) by using an information-sharing task that participants had prior experience with to map it more closely to real world experiences; (2) by including dilemma scenarios such as help-seeking with especially high costs for the co-operator and typical of everyday work situations; (3) by using collaboration times similar to real work settings (one week vs. two academic terms); and (4) by using an information-sharing dilemma instead of a dilemma game with monetary or token contributions to reflect the importance of information in today's knowledge-intensive work places.

Overall, participants tended to focus more on the immediate task outcome in the short-term and more on equality in the exchange relationship in the long-term. The greater preference for insisting on equality in a long-term collaboration can be interpreted as an aim to set a norm of reciprocity early on in the relationship to avoid exploitation in the future. Accepting uneven contributions or even defection of the partner in a long-term collaboration would signal that it is acceptable to “play the sucker” in the exchange relationship with potentially very high costs in the future. Consistent with this finding, participants were significantly more willing to put up with a defecting partner and to contribute more to get the task done when the collaboration time was short, which can be interpreted as a direct effect of anticipated collaboration time. If the collaboration is over after one week, the potential exploitation is very limited, but there is also not much time to reward cooperation or punish defection. Hence, establishing norms of reciprocity is not an effective strategy in short-term collaboration, where there is very limited time to get the job done and achieve the desired outcome. This seems to lead to a much greater focus on the task and less focus on relationship management, which is also consistent with results found in a study on time and creativity in teams (Bakker et al, 2013) and has been postulated in a theoretical paper on collaboration in temporary virtual teams (Saunders & Ahuja, 2006).

A scenario of specific interest is the social dilemma of helping a less experienced partner because the costs of cooperation for the supporting partner are very high. The helping dilemma is of great practical importance for team management because real teams need that type of support between team members with different skills and abilities to be able to be productive. Interestingly, the opposite effect to the overall tendencies above could be found for helping behaviour. Participants were less willing to help a partner in a long-term collaboration, probably because of the high costs of helping an inexperienced partner long-term. Consistent with this, helping increased in a short-term collaboration, presumably

because the investment was limited and getting the task done was more important than the costs of helping just once.

A rather unexpected and task specific finding was that participants were less likely to share literature in a long-term than a short-term collaboration. Somewhat counter-intuitively, participants rather chose to rely on themselves for the literature search and review in the long-term condition but not in the short term collaboration. It can only be speculated at this stage that this might have to do with a lack of trust in the academic competence of the cooperation partner due to an order effect in the study design. In the scenario section immediately pre-ceding the question about sharing literature search and reviews was the helping scenario portraying the partner as inexperienced. While this is probably an unintended effect of the study design, it further confirms the effect of collaboration time on information-sharing. In the long-term, participants chose to not rely on the (presumably incompetent) partner as there was time to do it themselves. In contrast, in the one week condition they accepted all the help they could get even from an inexperienced partner.

Moreover, social value orientations also play a role: For instance, proselfs defected more often as a reaction to a defecting partner, thus showing tit-for-tat behaviour, but only if the partner did not contribute to writing the term paper, but not if the task was to prepare the presentation. Proselfs seemed to react more strongly if costs were high (writing a paper is more costly than passing on literature) or if they ran the risk of being seen as incompetent in public, for example when giving a presentation in class. In contrast, prosocials were more concerned with establishing an equality norm if the partner defected and more willing to reciprocate if the partner was cooperative. This confirms recent research showing that prosocials not only prefer joint positive outcomes, but also equality in contributions (Van Lange et al., 2013). There was however, no interaction of SVO with collaboration time. One reason may lay in the use of an information-sharing dilemma rather than a monetary dilemma as in a previous study (Van Lange et al., 2011) and that the influence of SVO could be

dilemma-specific, something which was also found when comparing step-level and continuous public good games (Abele et al., 2010).

Limitations

Using a scenario design with a work group task that students generally have experience with has both advantages and disadvantages. An advantage is the higher ecological validity of such a scenario compared to dilemma games in the lab. A potential disadvantage is that related experiences in the real world might shape the answers in the scenario independently of the experimental conditions and thus weaken the effect of experimental manipulations. To get a measure of how strong those influences might be, preferred working style, previous experiences with group work and the importance of receiving a good grade were included as control variables. At least in this study, none of the variables above was a significant covariate which strengthens the argument that the differences in cooperation intentions can be attributed to collaboration time.

The results should be generalizable for student workgroups on the basis that it was a typical student task and participants were not asked to imagine doing tasks they had no prior experience with. However, transferability of the results to teams more generally is clearly limited, namely because important aspects of real work environments, for example work experience and perception of the work environment (such as work climate, superiors, colleagues, job security), are difficult to measure and to model adequately in an experimental setting.

Lastly, using a scenario approach has the disadvantage of only studying cooperation intentions and not actual behaviour. However, in this case the mere anticipation of collaboration time is actually very important because the attitude towards the partner and the motivation to collaborate is highly influenced by the knowledge about future collaboration and likely will shape subsequent behaviour in the present (Rabinovich et al., 2010).

Implications for Practice and Research

The findings have practical implications for team management and contribute to understanding why it can be difficult to implement knowledge management systems and to motivate employees to share information (Cabrera & Cabrera, 2002). Knowledge-sharing and developing a “culture of reciprocity” in an organisation both require a longer-term perspective, which employees often don’t have in economically unstable times with little job security. A few studies already point in that direction, for example, Koster, Sanders, and Emmerik (2003) found a decline of organizational citizenship behaviour in last-year PhD students, and Heide and Miner (1992) state that, “observers of industrial relations in the United States, for example, have suggested that both firms and unions are much more likely to adopt cooperative strategies when they assume they are likely to interact for an indeterminate future (...)” (p. 268). One implication of the present study is that organisations should give more consideration to the time frames of their knowledge management strategies as longer-term rewards will help to ensure and improve employee cooperation (Tsui, Pearce, Porter, & Triploi, 1997). With regard to future research the findings show the importance of social dilemma paradigms that use information instead of monetary contributions and include behaviours such as helping and disengagement which are central for the functioning of real teams.

In conclusion, the fact that it was possible to find effects of collaboration time even in an overall highly cooperative student sample confirms the importance of time for work relationships in general and for information-sharing dilemmas in particular. It shows how sensibly people react to the different costs and benefits of short vs. long-time collaboration dilemmas and how the ‘shadow of the future’ shapes their attitudes and intentions in the present.

References

- ABELE, S., STASSER, G. & CHARTIER, C. 2010. Conflict and cooperation in the provision of public goods: A conceptual analysis of continuous and step-level games. *Personality and Social Psychology Review*, 14, 385-401.
- ARDICHVILI, A., PAGE, V. & WENTLING, T. 2003. Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, 7, 64-77.
- AXELROD, R. 1984. *The evolution of cooperation*, New York, Basic Books.
- BAGNOLI, M. & MCKEE, M. 1991. Voluntary contribution games: Efficient private provision of public goods. *Economic Inquiry*, 29, 351-366.
- BAKKER, R. M., BOROŞ, S., KENIS, P. & OERLEMANS, L. A. G. 2013. It's Only Temporary: Time Frame and the Dynamics of Creative Project Teams. *British Journal of Management*, 24, 383–397.
- BAKKER, R.M. & KNOBEN, J. 2015. Built to last or meant to end: Intertemporal choice in strategic alliance portfolios. *Organization Science*, 26, 256-276.
- BLOUNT, S. 2004. Time in groups: An Introduction. *Research on Managing Groups and Teams*, 6, 1-7.
- BÓ, P. D. 2005. Cooperation under the shadow of the future: Experimental evidence from infinitely repeated games. *The American Economic Review*, 95, 1591-1604.
- BOGAERT, S., BOONE, C. & DECLERCK, C. 2008. Social value orientation and cooperation in social dilemmas: A review and conceptual model. *British Journal of Social Psychology*, 47, 453-480.
- CABRERA, A. & CABRERA, E. F. 2002. Knowledge-sharing dilemmas. *Organization Studies*, 23, 687-710.

- CONNOLLY, T., THORN, B. K. & HEMINGER, A. 1992. Discretionary databases as social dilemmas. *In: MESSICK, D. M. & LIEBRAND, W. B. (eds.) Social dilemmas: Theoretical issues and research findings*. Elmsford, NY: Pergamonn Press, Inc.
- CRESS, U. & KIMMERLE, J. 2007. Guidelines and feedback in information exchange: The impact of behavioural anchors and descriptive norms in a social dilemma. *Group Dynamics: Theory, Research, and Practice*, 11, 42-53.
- DAWES, R. M. 1980. Social dilemmas. *Annual Review of Psychology*, 31, 169-193.
- DE CREMER, D. & BAKKER, M. 2003. Accountability and cooperation in social dilemmas: The influence of others' reputational concerns. *Current Psychology*, 22, 155-163.
- DE CREMER, D. & VAN DIJK, E. 2002. Perceived criticality and contributions in public good dilemmas: A matter of feeling responsible to all? *Group Processes & Intergroup Relations*, 5, 319-332.
- FUDENBERG, D. & MASKIN, E. 1990. Evolution and Cooperation in Noisy Repeated Games. *The American Economic Review*, 274-279.
- GÄRLING, T. 1999. Value priorities, social value orientations and cooperation in social dilemmas. *British Journal of Social Psychology*, 38, 397-408.
- GERSICK, C. J. G. 1988. Time and transition in work teams: Toward a new model of group development. *Academy of Management*, 31, 9-41.
- HEIDE, J. B. & MINER, A. S. 1992. The shadow of the future: Effects of anticipated interaction and frequency of contact on buyer-seller cooperation. *Academy of Management Journal*, 35, 265-291.
- KOSTER, F., SANDERS, K. & EMMERIK, H. 2003. Solidarity of temporary workers: Effects of temporal and network embeddedness on solidarity of Ph.D. students. *The Netherlands Journal of Social Sciences*, 38, 65-80.

- LEDYARD, J. O. 1995. Public goods: A survey of experimental research. *In*: KAGEL, J. H. & ROTH, A. E. (eds.) *The handbook of experimental economics*. Princeton, NJ: Princeton University Press.
- MCGRATH, J. E. 1991. Time, interaction, and performance. A theory of groups. *Small Group Research*, 22, 147-174.
- MOHAMMED, S., HAMILTON, K. & LIM, A. 2009. The incorporation of time in team research: Past, current, and future. *In*: SALAS, E., GOODWIN, G. & BURKE, C. S. (eds.) *Team effectiveness in complex organizations: Cross-disciplinary perspectives and approaches*. New York, NY: Routledge.
- MOSER, K. S. 2009. Managing experts by managing diversity: Individual motivations for sharing expertise in work teams. Conference Proceedings Academy of Management: Chicago, USA.
- MOSER, K. S. & WODZICKI, K. 2007. The effect of reward interdependence on cooperation and information-sharing intentions. *Swiss Journal of Psychology*, 66, 117-127.
- MURNIGHAN, J. K. & ROTH, A. E. 1983. Expecting continued play in prisoner's dilemma games: A test of several models. *Journal of Conflict Resolution*, 27, 279-300.
- NUTTIN, J. R. 1985. *Future time perspective and motivation: Theory and research method*, Hillsdale, NJ, Erlbaum.
- ORBELL, J. M. & DAWES, R. M. 1993. Social welfare, cooperators' advantage, and the option of not playing the game. , 787-800. *American Sociological Review*, 787-800.
- PALFREY, T. R. & ROSENTHAL, H. 1994. Repeated play, cooperation and coordination: An experimental study. *The Review of Economic Studies*, 61, 545-565.
- RABINOVICH, A., MORTON, T. & POSTMES, T. 2010. Time perspective and attitude-behaviour consistency in future-oriented behaviours. *British Journal of Social Psychology*, 49, 69-89.

- RADNER, R. 1986. Repeated partnership games with imperfect monitoring and no discounting. *The Review of Economic Studies*, 53, 43-57.
- ROE, R. A. 2008. Time in applied psychology. *European Psychologist*, 13, 37-52.
- SANNA, L. J., PARKS, C. D. & CHANG, E. C. 2003. Mixed-motive conflict in social dilemmas: Mood as input to competitive and cooperative goals. *Group Dynamics: Theory, Research, and Practice*, 7, 26-40.
- SAUNDERS, C. S., and AHUJA, M. 2006. Are All Distributed Teams the Same? Differentiating Between Temporary and Ongoing Distributed Teams. *Small Group Research*, 37, 662-700.
- SHAMIR, B. 1990. Calculations, values, and identities: The sources of collectivistic work motivation. *Human Relations*, 43, 313-332.
- STEINEL, W., UTZ, S. & KONING, L. 2010. The good, the bad and the ugly thing to do when sharing information: Revealing, concealing and lying depend on social motivation, distribution and importance of information. *Organisational Behaviour and Human Decision Processes*, 113, 85-96.
- SULEIMAN, R. & RAPOPORT, A. 1992. Provision of step level public goods with continuous contribution. *Journal of Behavioral Decision Making*, 5, 133-153.
- THIBAUT, J. W., & KELLEY, H. H. 1959. *The social psychology of groups*. Oxford: Wiley.
- TSUI, A. S., PEARCE, J. L., PORTER, L. W. & TRIPOLI, A. M. 1997. Alternative approaches to the employee-organization relationship: does investment in employees pay off? *Academy of Management Journal*, 40, 1089-1121.
- VAN LANGE, P., DE BRUIN, E., OTTEN, W., & JOIREMAN, J. 1997. Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, 73, 733-746.

- VAN LANGE, P., JOIREMAN, J., PARKS, C. & VAN DIJK, E. 2013. The psychology of social dilemmas: A review. *Organizational Behavior and Human Decision Processes*, 120, 125-141.
- VAN LANGE, P., KLAPWIJK, A. & VAN MUNSTER, L. M. 2011. How the shadow of the future might promote cooperation. *Group Processes & Intergroup Relations*, 1-14.
- WEBER, M. J., KOPELMAN, S. & MESSICK, D. M. 2004. A conceptual review of decision making in social dilemmas: Applying a logic of appropriateness. *Personality and Social Psychology Review*, 8, 281-307.
- ZIMBARDO, P. G. & BOYD, J. N. 1999. Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, 77, 1271-1288.

Table 1

Inter-correlations of all measures included (N=61).

	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Collaboration Time	-												
(2) Equality norm	.25*	-											
(3) Conditional defection	-.09	-.06	-										
(4) Disengagement	.09	.23	.42**	-									
(5) Conditional cooperation	.15	-.03	.23	.01	-								
(6) Compensation	-.13	-.25	.19	-.10	-.12	-							
(7) Helping	-.42**	-.32*	.08	-.08	-.10	.17	-						
(8) Full cooperation	-.32*	-.19	-.03	-.02	-.16	-.01	.30*	-					
(9) Full defection	.28*	.35**	.13	.23	.08	-.24	-.48**	-.28*	-				
(10) SVO	.15	.14	-.12	-.28*	.22	-.10	.04	.16	.08	-			
(11) Group work experience	-.11	.02	-.05	-.11	-.05	-.20	.23	.00	.04	.19	-		
(12) Importance of outcome	.09	.14	.04	.16	-.24	.09	-.17	.13	-.07	.19	.11	-	
(13) Working style preference	-.21	.03	-.36**	-.20	-.27*	-.05	.14	-.07	-.04	-.06	.39**	.19	-

Note. Correlations are based on the final sample. Collaboration time: -1 *short-term*, 1 *long-term*; working style preference: 0 *non-cooperative*, 1 *cooperative*; SVO: 0 *proself*, 1 *prosocial*; all cooperation items were assessed on a six-point scale (1 *strongly disagree* to 6 *strongly agree*).

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Figure 1.

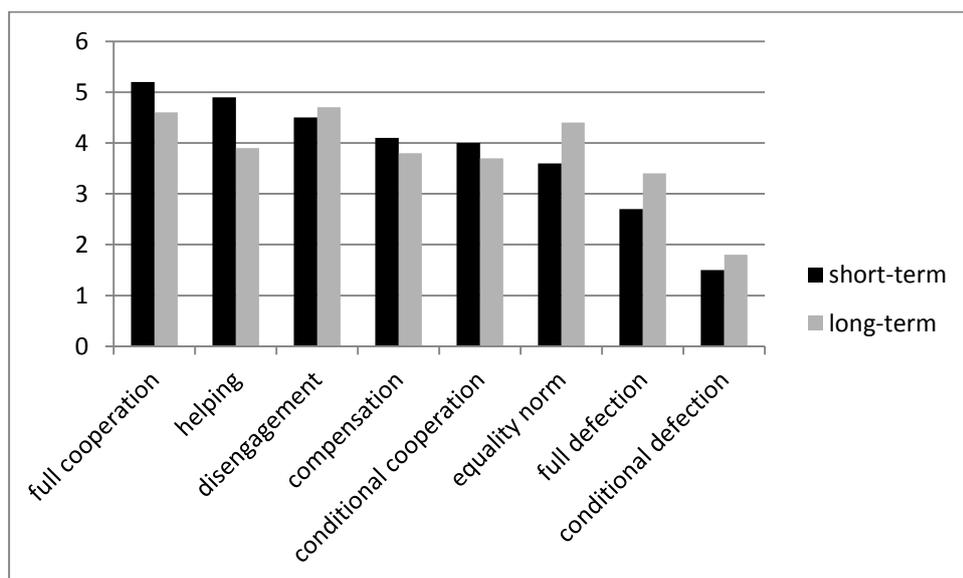


Figure 2.

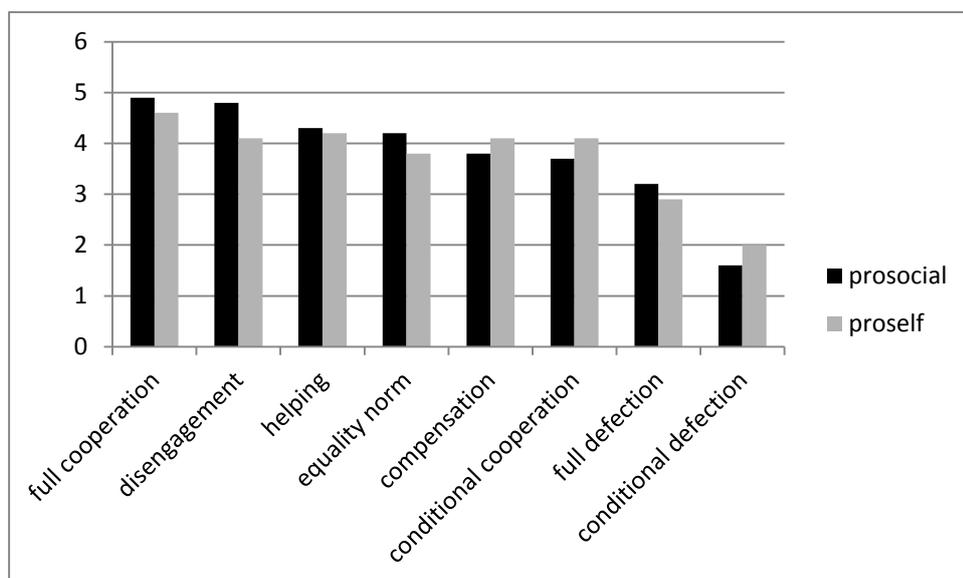


Figure captions

Figure 1. Mean values of the eight dependent variables in the two time conditions, showing the main effect of collaboration time on cooperation intentions. Scale ranged from 1 *strongly disagree* to 6 *strongly agree*.

Note. Low values of full defection indicate a low level of agreement with the intention to fully defect.

Figure 2. Mean values of the eight dependent variables for proselfs and prosocials, showing the main effect of social value orientation on cooperation intentions. Scale ranged from 1 (*strongly disagree*) to 6 (*strongly agree*).

Note. Low values of full defection indicate a low level of agreement with the intention to defect fully.