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TAKING A FREE RIDE: HOW TEAM LEARNING AFFECTS SOCIAL LOAFING

Abstract

Although collaboration is increasingly required in today's academic and work contexts, there are many ways in which teamwork can be impaired by dysfunctional inefficiencies and process loss. An important form of process loss is the tendency for individual members of a team to exert less effort than their fellow team members (i.e., social loafing). Since teams need to sustain the effort of team members as a collaborative resource, it is imperative to understand factors that shape social loafing in team tasks. This study examines simultaneously the degree to which goal orientation and changes in team learning (i.e., shifts in collective knowledge) affect social loafing. The authors use a multiwave design to explain changes in social loafing tendencies of 675 students working in teams. They conduct linear mixed effects modeling to show that individual team members who belong to teams that score higher than other teams on team learning throughout nine weeks of teamwork experience a decrease in social loafing. Although learning and performance orientations are significantly related to initial self- or peer-rated social loafing, they cannot explain ensuing changes in social loafing. Results highlight the importance of considering team-level dynamic properties when explaining fluctuations of motivation in teams.

Keywords: teams; cooperative learning; collaboration; social loafing; team learning

Educational Impact and Implications Statement: Even though small group work has gradually progressed to being one of the dominant approaches in the domain of learning and instruction and professional development, research shows that large numbers of team members exhibit uncooperative behaviors such as social loafing (i.e., individuals' tendency to expend less effort than their fellow team members). The results of a 9-week longitudinal study with 675 students working in teams reveal that teams experiencing a steeper shift in team's collective knowledge (i.e., team learning) than other teams show a decrease in social loafing tendencies over time. Additionally, they show that the learning and performance orientations of individual members predict social loafing at the start of the collaboration. These findings help us better understand how dynamic team-level properties can prevent individual members from engaging in dysfunctional behaviors.

Introduction

In the past few decades, classroom instructors and professional practitioners increasingly have used teams to improve learning and achievement (Johnson & Johnson, 2015; Salas et al., 2007). Both team and collaborative learning research are rooted in the principle that to be effective, teams must collaborate to overcome barriers to their interpersonal processes (Mathieu et al., 2019). That is, team success depends on team members' contributions to team outcomes, such that low contributions to teamwork and motivational losses are associated with low achievement (Kirschner, 2009). Although many studies have investigated the factors that explain how and why some teams outperform other teams (e.g., Kozlowski & Ilgen, 2006), only a relatively smaller body of literature considers and explains social motivation losses, such as "social loafing" (Kozlowski & Bell, 2013). Social loafing, which occurs when people expend less effort than their fellow team members in team contexts (Karau & Williams, 1993), is common in classroom settings. Most college graduates likely can recall instances in which they worked collectively on projects that were graded on a team basis, yet some team members "slacked off" and failed to put an equal share of effort into achieving the team outcomes.

Social loafing theory (also known as collective effort theory) (Karau & Williams, 1993) proposes explanations for why loafing occurs, most of which cite structural reasons for withheld inputs or team set-up factors, such as group size. While situational and dispositional variables can both drive social motivation (Toma & Butera, 2015), relatively few social loafing models incorporate team members' individual differences, which may account for the fact that the research evidence to date is limited and mixed (Karau & Wilhau, 2020). Differences in goal orientations (learning vs. performance) are expected to drive social motivation as they can influence the extent to which individual members generally value certain tasks (Karau & Wilhau, 2020). When team members hold certain goal orientations (i.e., situated orientations for action in an achievement task, Dweck, 1986), they are expected to display and sustain low

social loafing when they collaborate, specifically when they attach value to task mastery, understanding, and growth (i.e., learning orientation). Individual members who focus on demonstrating ability (i.e., performance orientation) might start their collaborative task with low social loafing because they seek to gain favorable judgments from others. However, performance orientation might relate to increased social loafing over time, due to the reception of team feedback and therefore, lower individual identifiability (Karau & Wilhau, 2020).

Research in this area is even scarcer at the team level of analysis. In a team, communication is directed toward a twofold purpose: (a) to develop the interpersonal relations within the team, and (b) to build a collective knowledge pool. However, most studies focus on the socioemotional side of teamwork (e.g., creation and maintenance of cohesiveness and a sense of community; Kreijns et al., 2003), while there is a larger gap in our understanding of the influence of important socio-cognitive mechanisms, such as team learning, on social loafing. As teamwork enables individuals to merge their individual knowledge and skills to reach a common goal, it is characterized by the phenomenon of team learning. Through team learning, defined as “a change in the team’s collective level of knowledge and skill produced by the shared experience of the team members” (Ellis et al., 2003, p. 822), individual members’ knowledge is transformed and integrated into a collective knowledge pool (Van den Bossche et al., 2011). Thereby, by progressively acquiring more complex knowledge and skills, teams can overcome motivational barriers such as social loafing (Raes et al., 2015; van Dick et al, 2009). In this sense, team learning and team motivation are closely related (Bell et al., 2012).

Importantly, social loafing develops over time during collaboration. As such, time is a key factor. As team members socially interact and initiate momentum on team tasks, they increase their collective knowledge pool, which is expected to decrease social loafing over time because of the whole team being involved in maintaining a shared conception of problems they encounter. However, the time factor is under-researched (Fransen et al., 2013; Hofmann &

Jones, 2005). Although many researchers have studied how groups develop into functional teams in organizational settings (Kozlowski & Bell, 2013), data about why teams develop differently and how different aspects of interaction are related are limited (Fransen et al., 2013). Research studying teams in educational settings proposes that high-learning teams likely follow a linear progressive development (Fransen et al., 2013; Johnson et al., 2002) because of their specific features (e.g., restricted duration of teamwork, valence of deadlines and grades, low expertise at the start of a collaboration). Accordingly, we expect student teams to follow a linear progression, on average. However, building upon group socialization theory supporting that the relationship between a team and its members also changes over time, we propose that time spent in teams is not sufficient to explain increases or decreases in social loafing. Teams also need to learn (Bell et al., 2012). Consequently, we expect high-learning teams to experience downward shifts in individual social loafing.

We first extend social loafing research by testing the impact of the emergence of, and change in, team learning on social loafing trajectories. We then connect these variables to person-related factors (i.e., goal orientations), moving back to the more proximal independent variables of our model. That is, we propose it is *change in learning* during the collaborative process, rather than team learning measured at a static point in time, and initial levels of individual differences, that decrease social loafing over time. This study makes several contributions to team motivation and team learning literature by (1) investigating interdependent contexts of naturally occurring teams; (2) using a multilevel, interactive framework to analyze social loafing tendencies in teams that incorporates important but under-researched individual and team-level factors; and (3) adopting a multiwave, multisource design to check for patterns in how social loafing evolves over time and account for differing perspectives on individual behavior in teams.

Literature Review and Hypotheses

Concept of Social Loafing

A team is a collection of individuals who work interdependently to achieve a common goal and share responsibility for team outcomes (Cohen & Bailey, 1997; Michaelsen et al., 2004). Individuals, in cooperative as opposed to competitive and individualistic situations, tend to engage in more on-task behaviors and less off-task, disruptive behaviors (Johnson & Johnson, 2015). However, placing individuals in teams and having them work together does not necessarily lead to cooperative efforts. Teamwork can also generate dysfunctional inefficiencies such as “social loafing”. According to the collective effort model (CEM), social loafing refers to individuals’ behavioral tendencies to put forth less effort than their teammates (Karau & Williams, 1993). It is believed to occur in teams as a result of the presence of others as coactors who combine their efforts on a collective task (Karau & Wilhau, 2020).

Social psychologists and organizational behavior researchers conceptualize social loafing as an individual motivational construct that operates in team contexts (Karau & Wilhau, 2020). They categorize team motivation losses due to social loafing into “interpersonal processes” in most team interaction classification systems (Kozlowski & Bell, 2013; Mathieu et al., 2008). Interestingly, in the literature on student engagement in educational psychology, the notion of effort is included in definitions of both cognitive and behavioral engagement (Fredricks et al., 2004). In the definition of social loafing mentioned above, the notion of effort is primarily behavioral, a matter of doing the work (or a fair share of the work), and less of learning and mastering the task. We could hence stipulate that social loafing is closer to the concept of behavioral (dis)engagement (i.e., individuals’ active participation, involvement and persistence in a learning activity) but applied to team settings and with a strong notion of relative efforts (relative to fellow team members) that is not specifically mentioned in the engagement literature (Fredricks et al. 2004; Skinner et al. 2009).

Compared with the volume of research on individual motivation, relatively little work has directly addressed social motivation and social loafing in teams (Kozlowski & Bell, 2013). Prior research showed that social loafing leads to several negative team processes and outcomes. It evokes distrust, lowered morale, and low team cohesion and performance (Duffy & Shaw, 2000; Jassawalla et al. 2008). Of moderate magnitude, it appears to be generalizable across tasks and subject populations (Karau & Williams, 1997).

Because teams that display detrimental processes are likely to sustain such negative interaction patterns over time (Webb & Cullian, 1983), literature on teams has implicitly regarded social loafing as a static rather than temporal variable (Aggarwal & O'Brien, 2008; Hofmann & Jones, 2005). However, we propose that social loafing may be more dynamic than previously conceptualized. In this paper, we posit that social loafing is not a single, discrete act; rather, individual team members may be inclined to contribute their fair shares at different times or according to different tasks. Hence, we view social loafing as a time-varying phenomenon that follows different trajectories over time. Whereas the focus of prior work has been on identifying the causes of social loafing at one point in time, we oppose the idea of social loafing as a static phenomenon and examine whether and how social loafing changes over time.

Operationalization of Social Loafing

To date, researchers have tended to capture the social loafing tendencies of individual team members from a single-source perspective. Most previous studies on social loafing use self-ratings of loafing; only a few studies have used peer ratings (e.g., Price et al., 2006), and only one study, to our knowledge, has used both peer and self-ratings (Stark et al., 2007).

Karau and Williams (1993) and Jassawalla et al. (2008) suggest social loafing occurs without self-awareness and that loafers generally find it socially undesirable to admit they loafed on completing collective tasks; the authors' argument draws on sources other than team members themselves, that is, their teammates. Arguably, according to human behavior concepts

and theories (e.g., attribution theory, decision making, performance appraisal) (Ilgen et al., 1994), attitudes and behaviors depend largely on perceptions. We can argue that social loafing starts to exert influence in a team when other members perceive that some member who relies too much on his or her teammates to accomplish his or her portion of the work takes advantage of them while “unfairly” enjoying and/or sharing the team outcome equally well with less work (Jassawalla et al., 2008; Schippers, 2014). This proposal is often used as a main argument for measuring “perceived social loafing of others” (i.e., an individual’s assessment of the others’ relative contribution to the team) (Piezon & Ferree, 2008; Zhu et al., 2019).

At the same time, some researchers (e.g., Cheng & Warren, 1999) question the reliability of peer evaluations, suggesting peer ratings may suffer from a halo effect (Loughry et al., 2007), leniency effect, or lack of skill in differentiating teammates. For example, Davison et al. (2014) find that only high performers are able to deliver evaluations of teammates that differentiate between those who perform well and those who perform poorly. Peer ratings also may be biased by friendships or personal dislikes (Barclay & Harland, 1995). These limitations could lead to the use of self-ratings of social loafing. For example, Price and colleagues (2006) found in their study using both peer and self-ratings that individuals were more inclined to highlight their own loafing than the loafing of others. Another argument in favor of self-assessment purports that questioning one’s own relative contribution to the team can lead to disclosure of one’s beliefs about him or herself as a team member (McCardle & Hadwin, 2015) and self-awareness of one’s antisocial behavior (Simms & Nichols, 2014). Finally, Conway and Lance (2010) claim that there are two major misconceptions about self vs. other-ratings. The first misconception is that other-report is superior to self-report measures. The second is that relationships between self-reported constructs are always upwardly biased. They contend that “rather than providing a more accurate estimate of true relationships among constructs, relationships estimated using different methods tend to be more attenuated and less accurate as compared to same-method

correlations” (Conway & Lance, 2010, p. 327). In sum, thus far, prior outcomes are mixed with regard to which source best assesses social loafing.

Social Loafing and Contextual Factors

Researchers offer multiple explanations for why social loafing takes place, with early work indicating that characteristics of the situation and individual members’ situational interpretations often drive social loafing (Williams et al., 1981). Specifically, the social loafing literature proposes that people engage in social loafing mostly because of a decreased perceived accountability and increased dispensability of effort experienced by team members (Harkins, 1987; Price et al., 2006). Similarly, cooperative learning research also demonstrates that positive goal interdependence and individual responsibility and accountability are likely to reduce social loafing (Buchs et al., 2015; Johnson & Johnson, 2009).

The robust presence of social loafing in teams has led researchers to identify not only its antecedents but also variables that might moderate the tendency to engage in social loafing (Kozlowski & Bell, 2013). Most authors note the influence of set-ups or work designs to minimize social loafing (Erez & Somech, 1996; Kozlowski & Bell, 2013; Stark et al., 2007). For example, social loafing can be reduced by improving task management and reward structures (George, 1992; Pearsall et al., 2010). Other strategies that reduce individual tendencies to loaf include increasing team familiarity and identifiability of individual members and decreasing team size (Erez & Somech, 1996; Lam, 2015). However, we propose that work-design factors are not sufficient to explain social loafing tendencies, because they also reside in individual team members. Accordingly, individual-level factors may explain individual differences in social loafing.

Social Loafing and Individual Differences

Individual differences have received less attention in social loafing research (Stark et al., 2007). As early as 1995, Comer began to integrate team members’ attitudes and individual

differences into social loafing frameworks, but empirical evidence and understanding of these factors remain relatively limited and are mostly derived from laboratory settings (Karau & Wilhau, 2020). There is increasing evidence that individual differences can explain the extent to which team members loaf (Bolin & Neuman, 2006; Morgeson et al., 2005); for example, those who believe they are better than others (Huguet et al., 1999) are more likely to loaf, whereas those with high levels of winning orientations and preferences for group work (Stark et al., 2007) and conscientious, agreeable team members (Schippers, 2014; Tan & Tan, 2008) are less likely to loaf.

This angle of individual differences points to a need for additional hypotheses that include person-based factors that can prevent or lower the occurrence and magnitude of social loafing throughout team collaborations.

A person-related motivational factor that appears to have received little research attention in the social loafing literature is goal orientations, including learning orientation and performance orientation (cf. Gagné & Zuckerman, 1999).

Learning Orientation and Performance Orientation

Work on goal orientations in team contexts is rooted in research arguing that how people change a given situation into an effective situation depends on their social motivation (Forgas et al., 2005; Schippers, & Scheepers, 2020). Social motivation theories are concerned with goal-directed behaviors that are aimed at, or central to, social interaction (Carver & Scheier, 1998; De Dreu et al., 2008). An assumption of social motivation is that one's tendency to collaborate and interact with others is largely driven by individual differences, in particular achievement goals (De Dreu et al., 2008). In accordance with this premise, we can hypothesize that goal orientations have important consequences for interpersonal interactions and for behavior change, more specifically change in social loafing. Since the purpose of the present paper is to

investigate antecedents of social loafing viewed as a dynamic behavior that emerges in social contexts, we expect members to bring their behavior in line with their initial goals.

Much research on motivation in individual settings has examined the basic concept of “goal” that accounts for how people intend to behave (Locke et al., 1981). Goal-related motivation theories and research have given rise to Achievement Goal Theory (AGT) that focuses on the psychological features of goals and individuals’ intention beyond a goal (i.e., goal orientation, Pintrich, 2000). Several goal structure models have emerged to explain the reasons for achievement behaviors (Kaplan & Maehr, 2007). In early work, goal structure is conceptualized as two-dimensional (Elliot, 2005). Specifically, these models stipulate that people’s goals focus on increasing competencies via learning (i.e., learning or mastery goals) vs. obtaining affirmative judgments about their competencies (i.e., performance goals) (Dweck, 1986, 1999). Despite the varying terminologies, mastery vs. performance goal orientations are closely related to learning vs. performance orientations.

Later research on achievement goal orientations proposes to consider whether achievement goal orientations lead individuals to approach or avoid a task (e.g., Elliot & Church, 1997). In the trichotomous achievement goal framework, the performance goal orientation construct is divided into a performance-approach goal orientation and a performance-avoidance goal orientation. Individuals who are performance-avoidance oriented are concerned with avoiding demonstrating low ability, mostly in comparative terms (Udan & Kaplan, 2020). Following this logic, Elliot and McGregor (2001) later propose a 2 × 2 model that adds a fourth goal orientation, a mastery-avoidance orientation, whereby a learner’s goal is to avoid misunderstandings and mistakes. It implies a fear of failure that is rooted in an intrapersonal rather than an interpersonal perspective.

Mastery or learning orientations generally relate to interest, persistence, positive emotions, use of deep learning approaches, and, under certain conditions, to achievement. In

contrast, performance-avoidance goals relate to negative emotions, disengagement in the face of obstacles, and low achievement. Performance-approach goals are associated with higher achievement, and under different circumstances, with more and less adaptive and maladaptive emotions and learning strategies (Payne et al., 2007; Rolland, 2012; Ramos, et al., 2021; Udan & Kaplan, 2020). Mastery-avoidance goals have received less scrutiny than the other goals. Although patterns of relations between mastery-avoidance goals and outcomes are inconsistent, they are generally associated with maladaptive outcomes (Madjar et al., 2011).

There is a growing number of studies incorporating AGT in team and collaborative learning research (Poortvliet et al., 2009). However, to understand how those operate in the context of teamwork, further empirical studies are needed (Lim & Lim, 2020). In collaborative learning research, studies consistently show that mastery orientation has positive effects on individual-level cognitive and affective outcomes such as cognitive processing (e.g., Patrick, et al., 2008) and a handful of studies similarly demonstrate positive effects on team behaviors such as other-regulation (Greisel et al., 2018; Lee et al., 2010; Lim & Lim, 2020; Volet & Mansfield, 2006) or feedback-seeking (Payne et al., 2007). By contrast, inconsistent relationships have been found between performance orientation and other-regulation. For example, some studies show that performance orientation has negative (Lee et al., 2010), positive (Greisel et al., 2018), and no significant relationships (Lim & Lim, 2020) with other-regulation, and feedback-seeking (Cellar et al., 2010; Payne et al., 2007). Further, in situations of team problem solving, Poortvliet and colleagues (Poortvliet et al., 2007; Poortvliet et al., 2012) show that performance orientation is related to information retention and even thwarting behavior. Most studies find no significant effects of the performance-avoidance goal orientation on team constructs. Payne et al. (2007) find a negative correlation with feedback-seeking in non-team settings, whereas Cellar et al. (2010) conclude that there is no significant relation between the two constructs.

In the present study, we decided to focus exclusively on the approach variants of the achievement goals because these are predictive of process variables in the collaborative learning literature, while the avoidance goals have been less studied and seem to neither hinder nor promote collaboration (Lin & Lin, 2020). For the sake of parsimony, we include learning and performance orientations in our multivariate approach, as the goal of our study is to investigate whether the significant relationships found in this literature reproduce at the team level.

As stated, studies to date suggest that team members scoring high on learning orientation tend to engage more in adaptive collaborative learning than members scoring low on this orientation. However, the results on the effects of performance orientations in collaborative contexts are mixed. Further, what is not yet clear in this strand of research is how different goal orientations induce differences in social loafing trajectories (Skinner et al., 2009).

Because they attach great value to hard work for its own sake, achievement or personal growth, team members who are learning oriented are also more likely to place value in specific collaborative tasks, and hence, are less likely to loaf. This task value proposition is consistent with the Collective Effort Model that suggests that individuals who view tasks as meaningful, important, or intrinsically interesting are less likely to engage in social loafing (Karau & Wilhau, 2020). Furthermore, individuals scoring high on learning orientation seek more help from, and exchange more information with, their peers (Newman & Schwager, 1995). Engaging in such help-seeking and information-sharing behaviors implies that this team member lacks a particular skill that others might have (Veenman et al., 2005). Thus, a learning orientation likely encourages collaboration and discourages social loafing (Poortvliet et al., 2009), such that it should associate positively with a willingness to participate in a team activity, regardless of effort identifiability. We propose that those with a high learning orientation are less likely to loaf at the start and over the course of collaborations.

H1: Team members with a higher learning orientation are less susceptible to display social loafing throughout the collaboration.

Similarly, when the pursuit of performance goals is driven by need for achievement, these goals might stimulate high relative contribution in a team (Lim & Lim, 2020). Specifically, since team members who endorse performance goals tend to strive to demonstrate their competence to others, performance orientation could be an effective motive in the short term, and hence, at the start of a team project. However, this effect might change in the long term (Brophy, 2005). In teams that have cooperative reward structures (e.g., team scores), members with high levels of performance orientation may not be able to use interpersonal standards, such as performance relative to their peers, to assess competence in achievement situations (Elliot & McGregor, 2001; Pintrich, 2000). Also, in teams, their individual efforts may not be identifiable, and feedback is generally provided at the team level. Since rewards and recognition are important for such people (Reeve, 2015), they might consequently develop a lowered sense of accountability and thus greater tendencies to loaf over time. Additionally, if individuals compete with their teammates to establish their abilities, they are less likely to collaborate, which may generate less harmonious social relations or augment disruptive behavior (Butler, 1995; Midgley et al., 2001). Accordingly, it is likely that a performance orientation does not encourage teamwork in the long term but does elicit the growth of anti-social tendencies such as social loafing (Poorevliet et al., 2009).

H2: Team members with a higher performance orientation are (a) less susceptible to display social loafing at the start of a team collaboration, (b) more susceptible to display social loafing over time.

Social Loafing and Team-Level Factors

Traditionally, psychological theories have mostly focused on individual variables (e.g., personality traits, attitudes, values) in their attempts to explain individual behavior, the

underlying assumption being that the causes of an individual's behavior are inside the individual. Social interdependence theory, on the other hand, postulates that individual behavior can be explained by the interactions among individuals that are inherently dynamic (Johnson & Johnson, 2015). As such, this theory recognizes the critical role played by team factors in the completion of a team task for individual members. There is a growing body of literature that recognizes the importance of team-level factors during collaboration (Johnson & Johnson, 2009). Despite this growing interest, in contrast to research on individual-level antecedents of social loafing, there is much less information about team-level factors that enable team members to resist social loafing or decrease its intensity over time.

The collaborative learning literature supports that team communication can serve two complementary purposes, (1) building a positive and cohesive socio-emotional climate (Bakhtiar et al., 2017; Isohätälä et al., 2020) and (2) facilitating team cognitive processes (Järvelä et al., 2016; Rogat & Linnenbrink Garcia, 2011).

A few studies on social loafing focus on the socio-emotional aspects of teams, and they typically rely on laboratory work to reveal, for example, that group cohesiveness reduces or eliminates social loafing (e.g., Duffy & Shaw, 2000; Lam, 2015). This result was replicated in field studies that affirm that social loafing in teams relates to low team cohesiveness (Høigaard et al., 2006; Liden et al., 2004). This finding usually is explained by high levels of member identification with teams and concerns about team welfare.

However, much less is known about the socio-cognitive factors that could substantially lower or even eliminate social loafing (Erez & Somech, 1996; Lam, 2015). Whereas empirical work on social loafing implies that team members simply add their individual inputs to produce team outcomes, teams are social systems that evolve and create multiple solutions that stem from ongoing knowledge sharing (Jassawalla et al., 2008). Despite this observation, there is a paucity of evidence on the extent to which team-level differences in team learning during

collaborative learning, can explain differences in individual loafing behavior. The present study aims to address this gap.

Social Loafing and Team Learning

In response to the lack of research on team socio-cognitive factors, we propose that individual team members reduce their loafing tendencies when their teams increase their collective learning. According to Wilson et al. (2007), team-level learning represents a change in a team's collective level of knowledge and skills. We conceptualize team learning as an output of shared experience of the team members, and more specifically, as a newly shared understanding of how the team should function and develop new knowledge and skills about the team tasks (Ellis et al., 2003; Van den Bossche et al., 2011).

We hence view team learning from a social constructivist perspective, according to which people create knowledge during social interactions (Boud, et al., 2001; Oliveira & Sadler, 2008). Team learning is frequently compared with collaborative and cooperative learning, though the concepts are not mutually exclusive. In this paper, team learning is not conceived as a structured peer learning method but shares some conceptual similarities with the two other constructs. As variations of "peer learning", they all incorporate features such as shared experiences and responsibilities, positive interdependence, individual accountability, and promotive interaction (Johnson & Johnson, 1999; Slavin, 2011). However, team learning, typically studied in work settings, also encompasses (a) the production of team-level outcomes, such as collective knowledge (i.e., knowledge held by the team as its own united entity) and team performance, (b) the main goal of successfully completing a given task, and (c) mutual accountability for these outcomes (Dochy et al., 2014). While research on cooperative and collaborative learning has recently shifted its attention to the group as the unit of analysis, it has traditionally focused on outputs at the individual level (e.g. what do students learn?) (Fransen et al., 2013; Vangrieken et al., 2016; Weinberger et al., 2007). As such, both research

lines complement each other when building an understanding of the extent to which team members converge toward increased collective knowledge.

Dynamics of Social Loafing and Team Learning

Teams are not static entities, but instead change in dynamic ways over time. To clarify the determinants of social loafing, it is therefore necessary to consider temporal aspects of teams, which include team development (i.e., changes in the team as a whole) and team socialization (i.e., changes in the relationship between the team and its members) (Arrow et al., 2000; Levine & Moreland, 1994).

Group socialization theory stipulates that both the team and its members are “potential influence agents” (Levine & Moreland, 1994, p. 306). This perspective purports that people change as a function of the team that they join. Traditionally, small group research focuses on the team perspective and overlooks how relations between a team and its members develop over time (Mathieu et al., 2019). This theory recognizes that individual members’ contribution levels change over time and that it can, in turn, change the relationship between the team and its members. As such, the effects of the team on an individual’s behavior can depend on team socialization, reflecting changes over time. If changes in contribution occur, this can result in divergence and the potential exclusion of the individual from the team. However, the team can also resocialize the individual (Levine et al., 2001). In line with this theory, we posit that when contribution levels become increasingly unequal, it creates a tension that can be repaired through knowledge creation. The team can hence change the individual so he or she can exert more effort towards the team goals. We hence propose that the development of new knowledge and skills has the potential to raise the satisfaction of the loafers’ needs.

Furthermore, there is a consensus across disciplines that teams as a whole develop or change over time (Fransen et al., 2013; Hommes et al., 2014; Kozlowski & Bell, 2013). Since team learning requires interactions between individuals, inherently, it is emergent and dynamic

and involves developmental progression (Kozlowski & Bell, 2008). It supposes a shift in knowledge state – a knowledge trajectory over time. As teams develop and evolve from groups of individual members to become collectivities with well-mapped repertoires of adaptive skills, the learning that emerges is not only inextricably connected to the fundamentals of social motivation but also changes over time (Goodman & Dabbish, 2011; Wiese & Burke, 2019).

Recently, more promising research efforts adopt a regulatory approach to team learning. In this view, team learning takes a regulatory role. Team members respond to goal progress, adjust their efforts and strategies and create newly shared understandings. In turn, this role should benefit motivational processes (Bell et al., 2012; Chen et al., 2009). However, the regulatory perspective on team learning requires further consideration, especially with regard to its relationship to motivation in team contexts. Using this theoretical model, we posit that dynamics inherent to team learning shape motivational states that emerge over time. By increasing team learning, teams can increase their effort and attention to team goal accomplishment and strategies and thereby reduce process losses in the form of social loafing. A steeper change in collective knowledge is expected to lower social loafing because it would necessitate that the whole team devotes attention to integrating individually held information into the team's collective knowledge state and maintaining a shared conception of a problem.

To join emerging efforts to explore the dynamic relationships between team learning and social loafing, both conceptually and empirically, we formulate and test the following hypothesis:

H3: An increase in team learning leads to a decrease in social loafing, even when controlling for individual goal orientations.

In summary, though prior work on social loafing offers important theoretical foundations pertaining to the reasons for social loafing and the limiting conditions of its effects, several significant theoretical and practical gaps remain. First, it has traditionally

conceptualized social loafing as a stable rather than a dynamic construct. Second, it has mostly focused on structural reasons and set-up factors to explain social loafing. Relatively fewer studies have investigated other reasons related to individual differences and team-level factors. Third, even though goal orientation theory and social motivation theory postulate interrelations between goal orientations and motivation, the effects of goals orientations on social loafing development have not been closely examined. Fourth, research on team-level factors, and more specifically on team socio-cognitive factors, is even scarcer in the social loafing literature. Furthermore, building upon social interdependence theory and a regulatory approach of team learning (for theoretical considerations) as well as on group socialization theory and team development models (for temporal considerations), team learning appears as a promising yet underexplored emergent socio-cognitive mechanism that can initiate a downward shift in individual social loafing. So far, however, there has been little discussion about the power of team learning growth on change in social loafing. Fifth, studies have tended to collect data from single sources, leaving room for same-source biases. To address these research gaps on social loafing, our goal is to identify individual and team factors, namely goal orientations and team learning, that together make up for this process loss; to do so, we use a multi-level framework and research design (Kozlowski & Klein, 2000), a repeated-measure design, and multiple assessors of social loafing tendencies.

Methods

Data and Sample

Participants in our study ($n = 675$) were first-year business students attending a Research Methods course in their first trimester at a Dutch university. They were required to form three- or four-person teams ($n = 195$ teams, 105 three-person teams, 90 four-person teams) to complete tasks. The course used a self-selection approach in which students selected their own teams for the entire trimester. At the start of the course, students completed an online survey measuring

the independent variables, that is, learning orientation and performance orientation (T0). Throughout the trimester, they were required to complete three team assignments, which counted toward their final grade. Just before they turned in each assignment, students were contacted by e-mail and were asked to fill out the online surveys individually to measure team learning (T1, T2, T3) and social loafing (T1, T2, T3). They were briefed that the questionnaire was referring to the team assignments they had just completed collaboratively. The assignments varied in difficulty. The first task consisted of choosing a research topic from a list, reading the accompanying case, conducting a literature search using different databases (e.g., Google Scholar, JSTOR), making an inventory of relevant articles, and comparing their results. Most students already were acquainted with literature search in databases, so this task was not difficult. The second task, of greater difficulty, involved reading and analyzing a scientific article, building a complex conceptual model of the variables measured in the article, and formulating research hypotheses. The task was additive in nature: it lacked structure, there were no clear strategies, and more than one correct solution was possible. Finally, the third task, of moderately high difficulty, required teams to read a case, compose a research question, and answer scientific reasoning questions. According to their research question, students had to select and justify the most appropriate research method (e.g., experiment, case study, survey study); define whether the aim of the study would be to explore, explain, or describe (e.g., theory building vs. theory testing); and justify which research strategy would be least suitable for answering the research question. Teams also had to formulate recommendations according to the case. In total, they worked together for about nine weeks to complete these three team assignments. All members received the same grade on their assignments irrespective of individual effort, and performance standards were clearly communicated.

The response rate for the first survey was 94.43% (729 students); for the second survey, it was 91.58% (707 students); and for the third survey, it was 88.60% (684 students). We

omitted from the analysis teams for which the data of two or three members were missing. The final sample consisted of 675 students distributed in 195 teams. Of these respondents, 70.80% were men, 28.90% were women, and for .30%, information about gender was missing. The mean age of the participants was 18.76 years (standard deviation [SD] = 1.48); 68.80% were Dutch, 24.60% indicated non-Dutch nationality, and 6.60% did not indicate any nationality.

Procedure

Data were collected with an online survey, sent by two research assistants. None of the authors nor the assistants were involved in teaching the Research Methods class. Moreover, the teachers were not aware of the purposes of the research. Because students filled out the questionnaires before they received their grades for their tasks, feedback on how well they did on the task did not affect their perceptions of the measured variables. Participants were briefed about the purpose of the research and given the opportunity to opt out, but none of the students did so, and the final sample remained unchanged.

Measures

Team Learning

To assess team learning, we used a 5-item scale from the input-mediator-output-input (IMOI) model to grasp team dynamics, as described by Ilgen et al. (2005) and adapted by Schippers et al. (2013). Items included, for instance, “We learned from our mistakes in our tasks,” “We learned how to improve at our tasks,” and “We developed new knowledge or skills about our tasks” (1 = “strongly disagree;” 5 = “strongly agree”). Team members rated these items individually. Their responses were aggregated to the team level to obtain team learning scores for each team at the three time points when team learning was measured. The Cronbach’s alpha coefficients were .79 for Time 1, .78 for Time 2, and .80 for Time 3.

Social Loafing Tendencies

We assessed social loafing tendencies with a 4-item measure derived from a questionnaire developed by George (1992) and adapted by Schippers (2014). We

operationalized social loafing in two ways: self-reported and peer-reported. Because both sources of assessment have advantages and disadvantages, combining them offers a valid alternative to using one source over the other. To our knowledge, only Stark et al. (2007) use both self-ratings and peer ratings to study social loafing, concluding that participants are more willing to admit their own loafing behaviors than recognize the loafing of their teammates. However, they emphasize it is legitimate to expect that social loafing appraisals from different perspectives (e.g., self vs. teammates) will differ. Therefore, to account for differing perspectives on individual behavior in teams, we use the two separate source measures of social loafing behavior.

We summed self-reported responses across items that asked team members about the extent to which they “defer responsibilities they should assume to other team members,” “put forth less effort than other members of their team,” “prefer to let the other team members do the work if possible,” and “put forth less effort on the assignment when other team members are around to do the work” (1 = “totally disagree;” 5 = “totally agree”). For this measure, the Cronbach's alphas were of .85 for Time 1, .88 for Time 2, and .88 for Time 3. With regard to peer-rated social loafing, team members wrote down the names of their teammates and rated them on each of the four items on a 5-point Likert scale using the same labels as the self-report questionnaire. To justify aggregating the peer ratings, we assessed interrater agreement within teams according to r_{wg} values (level of within-group agreement of the peer evaluation score for each referent). Because these estimates produced very good indicators of peer evaluation reliability (average $r_{wg} = .88$), we averaged the peer ratings and used these scores for all analyses in the study. The Cronbach's alphas were .87 for Time 1, .87 for Time 2, and .86 for Time 3. In the coding, items were reversed, such that higher scores indicated higher levels of social loafing tendencies.

Learning Orientation and Performance Orientation

To assess learning and performance orientations, we used the 8-item scales developed by Button et al. (1996). Sample items for learning orientation (alpha = .84) included “The

opportunity to learn new things is important to me,” and “I prefer to work on tasks that force me to learn new things.” Sample items for performance orientation ($\alpha = .74$) included “I prefer to do things that I can do well rather than things that I do poorly,” and “The opinions others have about how well I can do certain things are important to me.”

Data Aggregation

We evaluated individual-level scores on the team learning scale to justify aggregation to the team level. To assess within-group heterogeneity, we calculated $r_{WG(j)}$ indices (James et al., 1984) for each measurement time of team learning with a cutoff criterion of .70 (George, 1990). Using the uniform null and normal distributions (George & James, 1993), the average $r_{WG(j)}$ scores were appropriate for T1 ($r_{WG(j)} = .99$, $SD = .52$), T2 ($r_{WG(j)} = .99$, $SD = .52$), and T3 ($r_{WG(j)} = .98$, $SD = .55$). We also calculated the intraclass correlation coefficient, ICC(1), to identify the proportion of the variance in the measures that could be explained by team membership, and the ICC(2) to assess the reliability of the team means for team learning (Bliese, 2000). All ICC(1) scores were greater than 0, and their corresponding one-way analyses of variance (ANOVAs) were significant at $p < .05$. Specifically, the ICC(1) coefficients were .33 (T1), .41 (T2), and .40 (T3). The ICC(2) coefficients were .60 (T1), .68 (T2), and .66 (T3). The cutoff level of .60 thus was attained for ICC(2) too (Glick, 1985). These analyses provided sufficient support for aggregating our individual-level scores to the team level.

Hypotheses Testing

We conducted linear mixed effects modeling to examine the degrees to which goal orientations affected initial levels and growth of social loafing and the initial levels and growth of team learning affected initial levels and growth of social loafing (Duncan et al., 2006). With this technique, we can examine average trajectories, the pattern of change in individual and team constructs, and variations across individuals and teams, as well as analyzing the instigators of such variations (e.g., intercept or change in team learning) (Mathieu & Rapp, 2009). This

method models the repeated measures of an observed variable, reflecting the initial status of individuals and the rate of change in the dependent variables across time periods. Moreover, it allows us to account for the complex multilevel structure of the data. Repeated measures (Level 1) were nested within individuals (Level 2) who were nested within teams (Level 3). For these analyses, we used the computing environment R Core Team (R) and the linear mixed-effects models using “Eigen” and S4 package (LME4) (Bates et al., 2016).

In a first step, we modeled three unconditional-growth models in which no predictors were included except the effects of time. For both dependent variables (peer-rated and self-rated social loafing), we first estimated a model in which we assumed a linear effect of time. In the second model, we allowed the intercepts and the slope of time to vary from individual to individual. In the third model, we allowed both the intercept and the slope of time to vary from individual to individual and from team to team. We expected between-team differences in both the initial scores and how social loafing tendencies evolved over the three measurement occasions. The Step 2 analyses tested the effects of goal orientations and team learning (H1, H2, H3) on both dependent variables. We first modeled the effects of learning and performance orientation on the social loafing intercept and change. We compared the fit of this model to the fit of the best unconditional model using a -2 log likelihood test and the Akaike information criterion (AIC) (lower AIC values indicate better model fit). Then, we compared the fit of the model with only individual-level factors against a model in which we added team learning as a team-level explanatory factor, to decide which fit the data best. Finally, to test H3, we constructed two measures of team learning: team learning initial states and team learning growth throughout the trimester.

Results

Self-Rated Social Loafing

Level 1 Analyses: How Does Self-Rated Social Loafing Change Over Time?

In the first step, we modeled an unconditional growth model in which no predictors of social loafing were included, except the effects of time (with the time variable coded such that the initial time point = 0). We contrasted a model in which the slope of time could vary from individual to individual (Model 2) with a model in which the effect of time was included only in the fixed part (Model 1) (see Table 2). Model 2 achieved better fit. Some individuals loafed more over time, some loafed less, and others stagnated. Moreover, the model that added the team-level perspective of social loafing (Model 3) attained an even better fit; the slope of time varied from individual to individual and from team to team. Accordingly, this model predicts that social loafing evolves differently in different teams, such that some teams show increased social loafing and other teams show either no evolution or a decrease in social loafing.

INSERT TABLE 1 ABOUT HERE

Level 2 Analyses: How Do Learning Orientation, Performance Orientation, and Team Learning Affect Self-Rated Social Loafing?

In the second step, we investigated factors that may explain the change trajectories of social loafing. This stage was fundamental to understanding why some individuals loafed more or reduced their loafing behaviors over time. In Model 4, we tested only goal orientation effects, whereas in Model 5, we added the main effects of team learning initial states at Time 0 and team learning growth, as well as the interaction effects between these variables. Finally, in Model 6, we added the control variable team size.

From the comparison of the various models tested (see Table 2), we conclude that the multi-level model combining the three explanatory factors—learning orientation and performance orientations of individual members and team learning (Model 5)—showed better fit than the model that accounted for individual-level factors only (Model 4), which was better than the unconditional model (Model 3). Table 3 displays the Model 5 parameter estimates.

INSERT TABLE 2 ABOUT HERE

Individual-Level Factors. Our results show that only learning orientation had stable effects over time. There was no significant interaction with time. That is, though neither learning nor performance orientation explained why some individuals differed in their social loafing tendencies over time, learning orientation did influence their initial states of social loafing. Partially consistent with H1, learning orientation relates negatively to self-rated social loafing but there are no time effects. We did not, however, find support for H2.

Team-Level Factor. At the team level, the change in team learning showed a negative effect on the change of social loafing. Individual members who were part of teams that scored higher on team learning throughout the nine weeks of teamwork scored lower on social loafing. Thus, only change in team learning explains variations of social loafing over time, thereby confirming our H3 with regard to self-reported social loafing. Finally, there was a significant effect of the control variable ‘team size’, showing a higher degree of self-rated social loafing for members in teams of 3 than for members in teams of 4.

Peer-Rated Social Loafing

Level 1 Analyses: How Does Self-Rated Social Loafing Change Over Time?

Following the same procedure for self-rated social loafing, we modeled unconditional growth without any predictors of peer-rated social loafing except the effects of time. On average, we found the same pattern of results. In Model 3, in which we allowed the slope of time to vary from individual member to individual member, and from team to team, we found better fit than Model 2 (in which we allowed the slope of time to vary from individual member to individual member), which was better than Model 1, in which we added only the effect of time to the fixed part (Table 4). Model 3 predicts that growth trajectories in peer-rated social loafing differ from team to team, such that some indicate increases in peer-rated social loafing, but others show no change or decreases in peer-rated social loafing.

INSERT TABLE 3 ABOUT HERE

Level 2 Analyses: How Do Learning Orientation, Performance Orientation, and Team Learning Affect Peer-Rated Social Loafing?

In the second step, we tested whether variations of the direction of change in peer-rated social loafing also can be explained by the explanatory factors of our study. Model 4, in which we added the effects of performance and learning orientations on social loafing and their interaction effects with the time variable, did not have a significantly better fit than the unconditional growth model (Model 3); we concluded that both performance and learning orientations have no significant effects on peer-rated social loafing. Accordingly, we estimated Model 5 in a more parsimonious way, keeping the main effects of goal orientations in the model as control variables but removing the interaction effects with time. Thus, Model 5 models the effects of team learning on peer-rated social loafing, after controlling for the main effects of the individual-level factors, learning and performance orientations. It achieves a significantly better fit than Model 4. Table 5 displays the parameter estimates of this model.

INSERT TABLE 4 ABOUT HERE

Individual-Level Factors. Although we controlled for the effects of goal orientations, the parameter estimates for the effects of learning orientation were not significantly different from zero. By contrast, performance orientation was found to be negatively related to peer-rated social loafing (H2a) but there was no significant interaction with time (H2b). This result differs from the self-rated data. Thus, H1 and H2b are not confirmed for peer-rated social loafing.

Team-Level Factor. The initial level of team learning had a significant negative effect on peer-rated social loafing at the start. Therefore, in teams in which initial learning scores were higher, lower social loafing was reported by peers. Over time, the change of team learning (growth) had a negative interaction effect on social loafing as rated by peers. That is, teams that increased their team learning over time were able to counteract the negative effects of social loafing tendencies perceived by the teammates; these teams showed a decrease in peer-rated

social loafing (H3). There was also a significant effect of the control variable ‘team size’, showing a higher degree of peer-rated social loafing for members in teams of 3 than for members in teams of 4.

Discussion

Research in work and educational settings shows that simply asking individuals to collaborate does not necessarily lead to optimal collaboration (Johnson & Johnson, 2014; Kozlowski & Bell, 2013). Teamwork creates social motivational challenges that teams need to overcome throughout their experiences (Järvelä & Järvenoja, 2011). Typically, motivational challenges in teams tend to lie in individual members’ tendency to exert less effort than their teammates (i.e., social loafing), leading to process loss. This is highly concerning as social loafing may intensify over time and lead to a downward spiral of motivation and process losses. This paper aimed at examining how working on a team task shapes individual members’ tendency to exert their fair share of effort. Our study showed that teams that score high on team learning throughout nine weeks of teamwork experience decreased social loafing.

The primary contribution of this paper has been to account for the temporal dynamics of social loafing and identify important individual- and team-level factors that affect its development. In doing so, our study produces three important sets of findings.

First, building on the collective effort model (CEM) and social interdependence theory, we find that loafing tendencies are more dynamic than previously thought. In a sample of temporary teams, social loafing trajectories appear to fluctuate across individuals and teams and even over a three-month period. Literature on teams has implicitly considered social loafing as a static rather than temporal variable (Aggarwal & O’Brien, 2008; Hofmann & Jones, 2005). Hence, this finding extends current knowledge about the dynamic nature of social motivation losses in teams (Kozlowski & Bell, 2013). Our finding is also consistent with the conceptualization that social loafing behaves like effort exertion (as part of behavioral engagement) in individual learning situations, which has been shown to be altered by situational

constraints (Malmberg & Martin, 2019). Researchers who investigated participation in social settings more generally have successfully demonstrated that participation can fluctuate over time (Cheung et al., 2008; Hewitt, 2005). Complementary research focused on SSRL in collaborative learning has recently provided evidence that engagement in cognitive interactions can vary from moment to moment (e.g., Isohätälä et al., 2020). However, factors triggering fluctuations in participation in student-led team tasks are less well understood (Isohätälä et al., 2020). Extending these lines of research on the temporal aspects of participation into social loafing models allowed us to verify that social loafing was also a fluctuating phenomenon across individuals and teams and to identify factors contributing to those fluctuations.

Second, building on previous research on the individual characteristics that determine people's tendencies to loaf (e.g., Charbonnier et al., 1998; Schippers, 2014), our findings show that the learning orientation of individual team members appears to have constant effects for any member across time (H1). However, if we had measured learning orientation repeatedly as well, we might have found some time effects of other observations of learning orientation on social loafing trajectories, in line with the strand of research that supports goal orientation variability (Bernacki et al., 2017). Nevertheless, these results corroborate the findings of recent work applying Achievement Goal theory (AGT) to collaborative settings. In this work, cross-sectional data reveal that learning orientation is positively related to collaborative (as opposed to anti-social) behaviors such as co-regulating the team processes and elaborating peers' content (Greisel et al., 2018; Lee et al., 2010). Note that an unanticipated finding of our study is that self-reported learning orientation does not predict peer-rated social loafing. This inconsistency may be due to differing perceptions of attitudes and behaviors by different members of the team. Finally, although the results of this study do not show any significant effects of performance orientation on self-rated social loafing emergence or development (H2), performance orientation is found to be negatively related to initial peer-rated social loafing

(H2a). This means that individuals scoring high on performance orientation are rated by their peers as low loafers at the first team assignment. This result may be explained by the fact that, because they seek to obtain affirmative judgments about their competencies, members scoring high on performance orientation are perceived as behaving collaboratively. Since the effect is not present for self-rated social loafing, these relationships may partly be explained by differing perceptions of own vs. other behaviors, an interesting avenue for future research. These conflicting results corroborate previous studies in the collaborative learning literature. In fact, contrary to learning orientation's main motivative role in collaborative learning, mixed results have been described so far regarding performance orientation (e.g., Lim & Lim, 2020). Such results raise the possibility that holding a performance orientation might have different consequences in team contexts where only team performance is measured, depending on the timing of the collaboration (Muis & Edwards, 2009). Additionally, it might be that social loafing is related to the avoidance variant of the achievement goals. Performance-avoidance goals—engaging in a task with the goal of avoiding revealing inabilities—have been shown to be related to disengagement in individual learning situations (Urduan & Kaplan, 2020).

It can thus be suggested that the relationship between goal orientation and social loafing is mediated by social goals, such as building caring and committed relationships and belonging to a team, and team orientation (Johnson & Johnson, 2009). Moreover, social goals could increase or decrease the level of endorsement of members' goals throughout the process of teamwork (Bernacki et al., 2014). For example, a high team orientation might explain how self-interest is expanded to joint interest and how new goals are crafted in collaborative situations, reducing the emergence of social loafing. Reaching a shared clarity and consensus about the team's purpose and an alignment between individual and team goals could hence help teams prevent dysfunctional inefficiencies such as social loafing and optimize the use of the team capabilities (Johnson & Johnson, 2015; Kayes et al., 2005). If this hypothesis holds true, this

will also suggest that social loafing can be changed and compensated for by strengthening team members' identification.

Third, the development of social loafing depends not only on the passage of time but also on the increase of team learning that arises and grows among team members. Importantly, our results show that only team learning—a team-level concept—appears to explain changes in the trajectories of social loafing, over and above individual goal orientations. Consistent with our hypothesis 3, over time, an increase in team learning leads to a decrease in social loafing. This finding is particularly significant in the context of the complex nature of motivation loss and the dearth of research that demonstrates a relationship between the emergence and changes in team learning and social loafing (Bell et al., 2012). It highlights the need to consider temporal aspects of teams, which include not only team development (i.e., changes in the team as a whole) but also team socialization (i.e., changes in the relationship between the team and its members) (Levine & Moreland, 1994). Consequently, these results corroborate group socialization theory introduced by Levine and Moreland (1994) who suggested that individuals change as a function of the team that they join. This theory provides a valuable temporal explanation of how individuals can become team members although, as noted by Kozlowski and Bell (2013), there is a paucity of research focusing on team socialization over time. Surprisingly, it is still widely believed that over time, individuals striving for their own goals naturally develop into team members of an autonomous team capable of adapting itself to meet environmental contingencies (Kayes et al., 2005). Furthermore, the present study extends our understanding of the regulatory approach to team learning (Bell et al., 2012; Chen et al., 2009) by linking the upgrade of shared knowledge to motivational processes.

However, in the current study we could only infer that socio-cognitive interactions had occurred that led to a shift in team's collective knowledge (Fransen et al., 2013). Prior research has identified several factors that may influence why and how an increase in team knowledge

predicts ensuing changes in social loafing, namely: (1) positive interdependence, (2) group processing behaviors, (3) perception of a team reward, and (4) socio-emotional interactions. Below, we elaborate on these four factors.

First, it is possible to hypothesize that positive interdependence (i.e., team members' perception that they can attain their goals only if all other teammates promote each other's efforts to achieve the goals) is necessary for team learning to have positive effects on social loafing. When individual members perceive positive interdependence, they might realize that their efforts are required for the team to create team knowledge and that they make a unique contribution to their team. Positive interdependence is also posited to create a sense of responsibility and accountability for completing their share of work (Johnson & Johnson, 2015).

Second, we can argue that group processing enables team learning development. Several fields of research provide insights into the nature of group processing. Social interdependence theory states that group processing encompasses analyzing and implementing actions to achieve the team's goals (Johnson & Johnson, 2009). In social psychology, group-level information processing (Hinsz et al., 1997) involves information sharing and use. Similarly, in the research on socially shared regulation of learning (SSRL), Volet and colleagues (2009) use the term 'high-level cognitive processing' depicting behaviors such as elaborating, drawing inferences, asking thought-provoking questions, and negotiating. They are all presumed to contribute to the co-construction of knowledge, a core behavior that can augment team knowledge (Van den Bossche et al., 2011). Hence, based on the premise that shared regulation leads to increased shared knowledge (Lajoie & Lu, 2011; Saab et al., 2012), and that shared regulation is scarce when at least one member is disengaged (Isohätälä et al., 2017), we could suggest that teams that experienced the steeper team learning shifts in our study self-regulated their motivation and cognition. Finally, these social regulation processes are similar to team learning behaviors described in small group research. They include reflecting

on team processes and outcomes, asking questions, sharing and discussing ideas and divergences, and solving them constructively to co-construct new understandings and reach mutual agreement (see Decuyper et al., 2010, for review).

Third, based on behavioral learning theories (Bandura, 1977) that posit that individuals will work hard on tasks for which they obtain a reward and exert less effort in tasks that yield no reward, we could propose that an increase in team knowledge can be perceived as a reward that make loafers work harder towards their team goals.

Finally, team learning may affect social loafing through enhanced concern with the team and its outcomes, higher sense of community and/or higher cohesiveness (Lam, 2015). Both research on collaborative learning and work in social psychology and organizational behavior have raised the importance of socio-emotional interactions that complement socio-cognitive interactions for successful teamwork (Isohätälä et al., 2017).

To summarize, our study complements past research by demonstrating the salience of studying the temporal dynamics of group motivational constructs and identifying team factors that eliminate motivation losses in group endeavors (Aggarwal & O'Brien, 2008, Bell et al., 2012). It therefore contributes to address the essential issues of why teams develop differently and how different aspects of interaction are connected at the individual and team levels (Fransen et al., 2013). Examining these relationships over a prolonged period of time, and over many performance episodes, may be a viable route for further research, which also should seek to specify any boundary conditions for the present effects. Research on other individual differences or contextual variables that might explain different social loafing trajectories also is necessary (Ogunfowora & Schmidt, 2015). For example, positive norms for cooperative work and constructive behaviors (Buchs et al., 2015) could prevent social loafing. Specifically, social norms that promote team goals, open lines of communication, early resolution, and that expect everyone to work hard will likely increase members' motivation to contribute to the team

efforts. It is expected that the more those norms are shared, the stronger would be the involvement of members in the team activity (Levine & Moreland, 2004). Further, research on other team-emergent mechanisms (e.g., trust, psychological safety, team cohesion) that might minimize social loafing also is necessary. Complementary research on regulated learning in social settings has provided insightful evidence that team members need to engage in regulated learning to develop joint knowledge construction (Järvelä et al., 2016, Malmberg et al., 2017). Growth in this research field provides an exciting opportunity for researchers to investigate teamwork by shedding light on metacognitive processes that are essential for overcoming motivational problems in collaborative learning. By examining these phenomena empirically, we could gain a better grasp on the complexities of motivation in team settings. Such insights could assist the design and application of interventions that stimulate behaviors and processes that have been shown to be helpful in reducing the tendency to engage in social loafing. If these results replicate across settings (e.g., in workplaces) and tasks, the use of team exercises, feedback, incentives, and debriefing interventions arguably could increase the use of effective behaviors and even reduce motivation loss (Gabelica et al., 2014; Pritchard et al., 2008).

Limitations and Future Directions

Although obvious strengths of the current study are that we tested the hypotheses with a large number of teams, over time and in a context where social loafing often occurs, our study is not without limitations. First, it is conceivable that there was a percept–percept bias in the first model, that predicted changes in self-rated loafing for testing relationships between variables from the same questionnaire. However, we minimized the impact of this bias by using temporal measurements (Podsakoff et al., 2003). Although the instruments and constructs we use have been shown to be both reliable and valid, self-reported team learning cannot fully cover learning behaviors and strategies in which teams engage. Because we did not systematically observe team learning processes, the challenges for continuing research are to document the processes that occur when individuals collaborate to solve team tasks (Fransen et

al., 2013), validate interventions to make teams function as effectively as possible, and investigate the impact of team learning and motivation processes on performance. Closer examination of communication processes may help determine whether and how learning behaviors vary in quality and affect social loafing. To address this issue, researchers could overlay qualitative analyses to clarify how the quality of specific learning processes (e.g., sharing information and knowledge; mutually refining, building on, or modifying each original offer; reflecting on team processes) increases or decreases over time in dynamic episodes with social loafing tendencies (Goodman & Dabbish, 2011). The focus of these analyses should be on the socio-cognitive and socio-emotional interactions that occur during teamwork, the conditions under which they occur, what the effects of these interactions are, and how they are interrelated (i.e., the interactions paradigm; Dillenbourg et al., 1996).

Second, our validated model differs slightly across the two sources of ratings of social loafing. We chose to investigate peer ratings and self ratings independently, because prior outcomes are mixed with regard to which source best assesses social loafing (Karau & Williams, 1993; Stark et al., 2007). We find a different pattern (higher peer-rating means) than Stark et al. (2007; higher self-rating means); their study participants were more willing to report their own versus their teammates' social loafing. However, the question of the "true" score of social loafing remains unanswered. To measure actual social loafing, researchers would need to observe, record, and interpret accurately team members' efforts (Lord, 1985; Mulvey & Klein, 1998). Although perceptions of social loafing and actual reduced effort may be associated, reduced effort also may occur without the awareness of team members (Mulvey & Klein, 1998). If reduced efforts are not perceived by the team, they may not affect team functioning and motivation. Therefore, perceptions of social loafing require further research. Along these lines, it also is important to note that prior work has provided empirical evidence that peer appraisals are associated with reduced social loafing (e.g., Druskat & Wolff, 1999).

In our study, because students' evaluations were completed early in the academic year and at multiple points, social loafing may have been lower than expected in situations of no peer appraisal. As a result, the magnitude of the underlying effects may be underestimated.

Third, we conducted our study with undergraduate student project teams. Although past research on social loafing also has used student samples (Alnuaimi et al., 2010; Gagné & Zuckerman, 1999; Schippers, 2014), we are cautious about the external validity of our findings. Student groups sometimes work less as a team and more as individual participants who complete separate portions of their assigned task independently (Skilton et al., 2008). Moreover, expertise distribution within teams in educational settings may be limited, which may limit the inputs team members have available to complete tasks and increase their dispensability. Researchers should determine if our results generalize to employees who constitute project teams outside formal educational settings (Price et al., 2006). Although loafing tendencies usually are demonstrated in laboratory settings (Huguet et al., 1999), team members in our study were not role playing; rather, they were performing meaningful tasks designed to be complex enough to demand team efforts, have a team goal and reward (i.e., have positive interdependence), and require that a few months be spent together. Our student teams had assignments that required the cooperation and coordination of team efforts across multiple meetings, but unlike teams in a work context, they lacked the same history of common experiences and identity (Karau & Hart, 1998).

Finally, the current study focused on just two goals assessed once at the start of the collaboration. While focusing on learning and performance goals is parsimonious, it fails to account for other goals that are potentially important in achievement situations in teams. Research within the achievement goal framework has proliferated over the past years and more complex models have been studied (i.e., trichotomous achievement goal framework and 2 X 2 achievement goal framework) (Urda & Kaplan, 2020). Additionally, there has been growing

evidence that achievement goals can change across tasks (Bernacki et al., 2014; Fryer & Elliot, 2007). Future research could capture variations in team members' endorsement of achievement goals over time and relate these fluctuations to social loafing trajectories. Researchers could verify if throughout the process of team goal pursuit and regulation, individual goal switches or intensification are related to increases or drops of social loafing.

Despite these limitations, our research contributes to emerging literature on the development of social loafing. By demonstrating that the increase of team learning can lower the emergence of social loafing, it provides further empirical support for the power of team learning on individual behaviors (Gabelica et al., 2014; Bell et al., 2012; Decuyper et al., 2010). It also provides an integrative theoretical model that combines individual- and team-level predictors of social loafing. It highlights the importance of other team members and their interactive behaviors in determining individual behavior. We hope this study stimulates further empirical and theoretical research on the temporal dynamics of social loafing.

Practical Implications

Any setting in which people's efforts are merged into a single output might be conducive to the demotivating effects of working in teams. Teachers and trainers may experience withheld effort that negatively affects not only teams' but also classes' performance and dynamics. In school settings, dealing with social loafing and its consequences has become a time-consuming concern for teachers who use team-based learning. An important challenge for research and practice is to implement strategies for maximizing team functioning and team learning, such that the potential of each team's resources can be fulfilled (Webb et al., 2002).

The outcomes of our study provide substantial insights for designing and supporting teams in ways that reduce opportunistic behavior such as social loafing (Tan & Tan, 2008). Our findings underscore the positive effects of learning orientation on the level of social loafing at the start of team activities. During team formation phases (Tuckman & Jenson, 1977), devoting

specific attention to favorable beliefs and appraisals of tasks and teams (high value to the task and team) may reduce tension arising from the uneven motivations that often occur in newly formed teams. Assessing members' goal orientations may help team managers and teachers anticipate anti-social behaviors and take early action to build the learning tones of their teams (Bunderson & Sutcliffe, 2003; Gagné & Zuckerman, 1999).

When working in increasingly learning-oriented teams, individual members also may move away from individualistic concerns and work harder when everyone's ideas and contributions are valued. This result is encouraging, because it suggests social loafing is a changeable behavior that fluctuates over time. Stimulating knowledge sharing and building, learning from prior mistakes, and constructive team discussions may reduce social loafing tendencies. By asking critical questions and introducing competing perspectives and interpretations, teachers and team facilitators can broaden discussions and promote deeper team concern, commitment, and engagement. This approach calls for the implementation and evaluation of the motivational benefits of interventions that facilitate team learning and maintain high learning opportunities and challenges throughout team tasks (Gabelica et al., 2014; Hackman & Wageman, 2005). For example, emerging research indicates that providing teams with feedback on how they have performed, and inducing team reflection on what teams do and how they do it, helps them become more effective, especially if their initial team performance is low (Gurtner et al., 2007). The cooperative learning literature also provides insight in this regard. Buchs et al. (2015), for example, highlight the needs to better prepare students for collaboration and use structured methods to encourage constructive interactions. Social interdependence theory traditionally presumed that team members had the necessary skills to collaborate successfully (Johnson & Johnson, 2015). To achieve team learning and effectiveness, it therefore appears necessary to help teams construct shared understandings of task characteristics and the team's knowledge in early stages of teamwork (Fransen et al., 2013).

From a cognitive perspective, team members with poor communication skills are less likely to benefit from team-based learning, because they may not be able to share their ideas and proposals with others; ask critical questions; reflect on their own and team functioning; provide constructive criticism; or disagree with elaborated argumentation (Kramarski, & Mevarech, 2003; Webb & Farivar, 1994). Therefore, preparing newly formed teams for collaboration by training them in team learning processes (e.g., shared reflection, co-construction, high-level elaboration, constructive disagreements, reaching agreement) that produce high team performance (Webb et al., 1998) is a promising avenue for team development.

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Table 1

Model Fit Statistics for the Five Models Fitted on Self-Rated Social Loafing

	-2LL	AIC	Chi ²	df	<i>p</i>
Model 1 (growth only fixed effect)	1635.4	1645.4			
Model 2 (M1 + individual differences in growth)	1492.7	1506.7	142.67	2	< 0.001
Model 3 (M2 + team differences in growth)	1485.9	1503.9	6.78	2	0.033
Model 4 (M3 + goal orientation effects)	1405.9	1431.9	80.04	4	< 0.001
Model 5 (M4 + team learning effects)	1394.8	1424.8	11.07	2	0.004
Model 6 (M5 + team size)	1389.5	1421.5	5.04	1	0.021

Notes: -2LL = -2 log-likelihood, AIC = Akaike information criterion, df = degrees of freedom.

Table 2

Parameter Estimates (Est.), Standard Errors (St.Err.) and *p*-Values from Model 6 Fitted on Self-Rated Social Loafing

	Est.	St. Err.	<i>p</i>
<i>Fixed part</i>			
Intercept *	3.171	0.235	< 0.001
Time	-0.018	0.014	0.182
Team size (= 3)	0.543	0.234	0.021
Performance orientation	-0.015	0.045	0.744
Learning orientation	-0.387	0.045	< 0.001
Team learning (initial score)	-0.459	0.353	0.194
Team learning (growth)	0.294	0.703	0.676
Team learning (initial score) * Time	0.189	0.187	0.315
Team learning (growth) * Time	-1.181	0.378	0.002
<i>Random part</i>			
<i>Individual Level</i>			
Variance in intercepts	0.243		
Variance in slopes	0.037		
Correlation intercept slope	-0.16		
<i>Team Level</i>			
Variance in intercepts	0.002		
Variance in slopes	0.006		
Correlation intercept slope	-1		
Residual variance	0.048		

* Reference category: team of size = 4

Table 3

Model Fit Statistics for the Five Models Fitted on Peer-Rated Social Loafing

	-2LL	AIC	Chi ²	df	<i>p</i>
Model 1 (growth only fixed effect)	2632.6	2642.6			
Model 2 (M1 + individual differences in growth)	2512.2	2526.2	120.403	2	< 0.001
Model 3 (M2 + team differences in growth)	2484.6	2502.6	27.555	2	< 0.001
Model 4 (M3 + goal orientation effects)	2477.0	2503.3	7.621	4	0.107
Model 5 (M4 + team learning effects)	2452.8	2482.8	24.216	2	< 0.001
Model 6 (M5 + team size)	2445.7	2477.7	7.122	1	<0.008

Notes: -2LL = -2 log-likelihood, AIC = Akaike information criterion, df = degrees of freedom.

Table 4

Parameter Estimates (Est.), Standard Errors (St.Err.) and P-Values from Model 6 Fitted on Peer-Rated Social Loafing

	Est.	St. Err.	<i>p</i>
<i>Fixed part</i>			
Intercept	2.105	0.283	< 0.001
Time	0.016	0.021	0.449
Team size (= 3)	0.565	0.210	0.007
Performance orientation	-0.111	0.055	0.045
Learning orientation	0.016	0.054	0.770
Team learning (initial score)	-1.292	0.505	0.012
Team learning (growth)	0.912	1.008	0.367
Team learning (initial score) * Time	0.251	0.295	0.455
Team learning (growth) * Time	-2.406	0.597	< 0.001
<i>Random part</i>			
<i>Individual Level</i>			
Variance in intercepts	0.255		
Variance in slopes	0.048		
Correlation intercept slope	0.230		
<i>Team Level</i>			
Variance in intercepts	0.061		
Variance in slopes	0.025		
Correlation intercept slope	-0.670		
Residual variance	0.135		

* Reference category: team size = 4