Article

Behavior–Output Control Theory, Trust and Social Loafing in Virtual Teams

Lionel P. Robert, Jr.

School of Information, University of Michigan, 4388 North Quad, 105 South State Street,
Ann Arbor, MI 48109-1285, USA; lprobert@umich.edu

Abstract: Social loafing, the act of withholding effort in teams, has been identified as an important problem in virtual teams. A lack of social control and the inability to observe or trust that others are fulfilling their commitments are often cited as major causes of social loafing in virtual teams where there is geographic dispersion and a reliance on electronic communications. Yet, more research is needed to better understand such claims. The goal of this study was to examine the impact of control and trust on social loafing in virtual teams. To accomplish this, we proposed and empirically tested a multi-level research model that explains the relationships among team controls, trust, social loafing, and team performance. We tested the model with 272 information technology employees in 39 virtual teams. Results indicate that control and trust reduce social loafing separately and also jointly.

Keywords: virtual teams; control; trust; social loafing

1. Introduction

Distance teamwork has moved from a novel concept to a common work arrangement. The ability to bring together needed expertise to address complex problems regardless of geographic dispersion is often cited as a key benefit of virtual teams [1,2]. Members of these teams are geographically dispersed and rely on electronic communications [3–5]. However, working effectively at a distance can be a challenge [6,7]. Social loafing, the act of withholding effort in teams, is often cited as one of the major challenges of working in virtual teams [8]. Yet, social loafing can undermine the performance of virtual teams.

The literature on virtual teams has given the problem of social loafing considerable attention; nevertheless, our understanding of the impact of social loafing in virtual teams is limited in several important ways. First, a lack of control and the inability to observe and therefore trust that others are also working are often cited as major causes of social loafing [8–10]. However, we do not fully understand the impact of the lack of control, such as monitoring, or trust on social loafing in virtual teams. Second, although virtual teams are likely to employ both control and trust simultaneously, the literature on control and trust in virtual teams has failed to acknowledge this and instead has focused on whether control increases trust or vice versa [3,4,11–14]. Finally, research on social loafing in virtual teams has focused primarily on experimental student teams performing brainstorming tasks [4,15]. However, we know little about what facilitates social loafing and its impact on the performance of virtual teams in more realistic settings. All three shortcomings are problematic because if team controls can reduce social loafing without undermining team trust, virtual team performance should increase. However, if team controls cannot reduce social loafing without undermining team trust, virtual team performance is likely to suffer. Therefore, addressing the above shortcomings will provide new insights into the impacts of team controls and team trust on the performance of virtual teams.

To address these shortcomings, we advance a model of virtual team performance for the following research question: "How does team monitoring and trust impact social loafing and ultimately team performance in virtual teams?" To answer this research question we proposed a multi-level model based on behavior–output control theory (BOCT) that examines the impact of team monitoring on individual-level trust and social loafing.

Against this backdrop, this research contributes to the growing body of work on social loafing in virtual teams by pursuing the following objectives:

(i) Extend the literature on social loafing in virtual teams to include the effects of both control and trust;
(ii) Develop a multi-level research model to explain the relationship between team monitoring and individual trust on social loafing in virtual teams and to explain the relationship between team social loafing and the performance of virtual teams;
(iii) Empirically test this proposed model in a field study with 272 information technology employees in 39 virtual teams.

This study contributes to the virtual team literature in several ways. First, this study contributes to the literature on social loafing in virtual teams. No researchers have sought to understand whether or how team monitoring and trust can be used to decrease social loafing in virtual teams. Yet according to the literature, control and trust should both be central to understanding social loafing in virtual teams [8–10]. Second, in this study we examined social loafing in organizational teams. Research on social loafing in virtual teams has focused on experimental student teams. Less is known about how to reduce social loafing in virtual teams embedded in organizational field settings. Third, this study contributes to our understanding of team monitoring in virtual teams. Despite the potential for team monitoring to help alleviate some of the challenges associated with working from a distance, much more work is needed to understand the impacts on virtual teams [4]. Fourth, this study contributes to our understanding of trust in virtual teams. Research on virtual teams has often focused on the developmental aspects of trust in virtual teams [1,3,4,11–13,16,17]. Much less is known about the conditions under which trust is effective or not; yet scholars have called for further research on understanding the conditions that dictate the effectiveness of trust [14,17] .

First we review the literature on social loafing, control, and trust in virtual teams. We then propose our theoretical model. Next, we describe the research method employed to test this model. Then we present the results. Finally, we discuss the implications for practice and future research.

2. Background Literature

2.1. Social Loafing in Virtual Teams

The study of why individuals tend to put forth less effort when they are members of a larger collective has been an important topic among scholars studying collocated teams. Maximilien Ringelmann [18] was the first scholar to identify this phenomenon. He studied rope-pulling teams and noticed that as more individuals were added to the team individual members exerted less effort. This phenomenon was originally labeled the "Ringelmann effect" [18] . Since then many studies have found support for this phenomenon in many different settings [15,19–23]. The losses associated with social loafing are significant because organizations are employing teams more rather than less [15].

Social loafing has become a particularly important topic for information systems scholars studying virtual teamwork [4,8]. Geographic dispersion and the reliance on electronic communication are expected to increase social loafing in virtual teams [9,24]. This is in part because social loafing is a self-feeding process. Individuals tend to consciously or unconsciously contribute less in teams, which is itself a problem [19]; however, team members in many cases respond by contributing less themselves to avoid being taken advantage of by their teammates. This is often labeled the "sucker effect" [25].

In this section, we discuss a broad cross-segment of the research on social loafing in virtual teams. Although the literature on social loafing in virtual teams is rich and diverse, several factors

continually appear across the various studies. These factors are team size, team dispersion, reliance on electronic communication, anonymity, feedback, and social comparison. These factors can be grouped into two categories. The first three factors—team size, team dispersion, and reliance on electronic communication—represent team design issues that facilitate social loafing. The remaining factors—anonymity, feedback, and social comparison—are all examples of individual motivational mechanisms used to decrease social loafing in virtual teams. Research on social loafing in virtual teams has studied the effects of team design issues, individual motivation mechanisms or a combination of both. These categories are discussed in greater detail in later sections.

Studies examining team design issues have manipulated team size, dispersion, and communication medium to determine their effects on social loafing. An early example of this is a study by Valacich, George, Nunamaker, and Vogel [26] that assessed the effects of team size and team dispersion on social loafing in electronic brainstorming teams. Valacich, Wheeler, Mennecke, and Wachter [27] extended this work by identifying knowledge distribution as an important moderator in the relationship between team size and social loafing. Later, researchers sought to understand the mechanisms by which the effects of team size and team dispersion increased social loafing and ultimately diminished team performance [8,10]. Much recent research has also been conducted to understand whether dispersion and electronic communication can heighten the negative effects associated with social loafing [28]. Research has also been conducted to isolate the impacts of electronic communications on social loafing separately from the effects of dispersion [29].

Another category of studies examined individual motivational mechanisms employed to decrease social loafing. This research has studied the impacts of identifying an individual's contribution, providing feedback about an individual's contribution, and comparing an individual's contribution to that of others through social comparisons. For example, Shepherd, Briggs, Reinig, Yen, and Nunamaker [30] studied how social comparisons could reduce social loafing. Roy, Gauvin, and Limayem [31] extended this work by investigating the effects of both social comparison and feedback. Researchers have also examined whether social loafing could be reduced in virtual teams by identifying individual contributions. Pissarra and Jesuino [32] found no significant reduction in social loafing due to the identification of individual contributions; while McLeod [33] did but only when individuals engaged in social comparisons. Finally, this work has been complemented by Suleiman and Watson [24] which found that individual self-feedback reduced social loafing.

Several trends emerge from the literature on social loafing in virtual teams. One, the vast majority of studies examine social loafing in the context of brainstorming teams, and all research on social loafing in virtual teams seems to be done with student teams. No study has examined social loafing in virtual teams within organizations. As a result, we know much less about social loafing in highly interdependent teams employed to perform complex tasks in natural settings. Two, despite the fact that researchers studying social loafing in virtual teams have posited that the major causes of social loafing in virtual teams are the lack of the ability to employ social controls and to observe or trust teammates, no one has examined the effects of social control and trust on social loafing in virtual teams. Yet studying the employment of controls would be a direct way to determine whether they can be effective in reducing social loafing in virtual teams. In addition, trust is often used as a mechanism to cope with the uncertainty associated with not being able to verify what others are doing. Taken together, both control and trust offer potential insights into understanding how to reduce social loafing in virtual teams.

2.2. Trust in Virtual Teams

Trust is an important element for effective team collaboration [1]. Although there are many definitions of trust, most seem to agree that trust involves some level of vulnerability to the actions of others along with the expectation that those others will fulfill their commitment [34–36]. Trust within teams has been associated with better team performance [37–39]. This is often a result of increases in cooperation, coordination, and communication [37,40].

There are at least two types of trust, one based on ability or competency and the other based on emotion and liking [36,41,42]. Trust based on competency is derived through rational assessment of

the trustee's ability, while the other is based on feelings of closeness [43]. These two types of trust are referred to as affective and cognitive trust [36]. Decisions based on cognitive trust are driven by a rational calculative process in which situational risks are weighed, while decisions based on affective trust are driven by emotional feelings of similarity and a common identity [36,42]. Both types of trust have been shown to be strong predictors of behavior [36,44–46].

Much of the literature on trust in virtual teams seeks to understand how trust can be developed in virtual teams. Originally, this research relied on theories that social interactions are needed to facilitate trust [35,44,45]. Geographic dispersion and the reliance on electronic communications were predicted to reduce both the quantity and quality of social interactions needed to develop trust in virtual teams [11,12]. Despite this, several studies have found that virtual teams can and do develop trust [17]. More recent studies have acknowledged alternative theories that explain trust in teams with little history [1]. With the exception of Kanawattanachai and Yoo [46], the research on trust in virtual teams has not examined the potential differentiated effects of affective and cognitive trust.

3. Theoretical Background

Behavior–output control theory (BOCT) posits that human behavior can be altered by comparing members' behavior to some predefined set of expectations and holding them accountable to meeting those expectations [47–49]. In teams, these predefined expectations are behaviors that members have agreed on as the appropriate behaviors needed to achieve the team's goals and objectives [49–52]. BOCT views team controls as a means to help ensure that team members' behaviors are aligned with the team's goals and objectives [14,52–54]. According to BOCT, effectiveness of team controls should be determined by whether team members conform to the pre-specified behaviors [3,4,49].

Teams typically employ controls by directing, monitoring, and evaluating the behavior or outcomes of team members [14,49,51,54–57]. Team monitoring is a widely used type of behavior control in teams [4,14]. Team monitoring involves observing whether team members have or have not complied with specific behaviors [4,14]. Team monitoring is used to alter the actions of team members by ensuring that they comply with specific behaviors needed to accomplish work tasks [14,55,58,59]. Team monitoring not only alters behavior by encouraging members to engage in appropriate behavior but also by discouraging members from engaging in inappropriate behavior.

To better understand the relationship between trust and social loafing in virtual teams, we developed a theoretical research model derived from BOCT (see Figure 1). Based on BOCT, we proposed that team monitoring moderates the relationship between individual cognitive and affective trust on individual social loafing, which in turn predicts individual performance. The research model draws from both social loafing and trust literature. Figure 1 provides a summary of these arguments. In the following section we introduce and discuss the concepts underlying the theoretical model. We discuss team monitoring, a type of control, followed by a discussion on cognitive- and affect-based trust. We then put forth a multilevel research model. Finally, we present the results and discussion sections, followed by the conclusion.
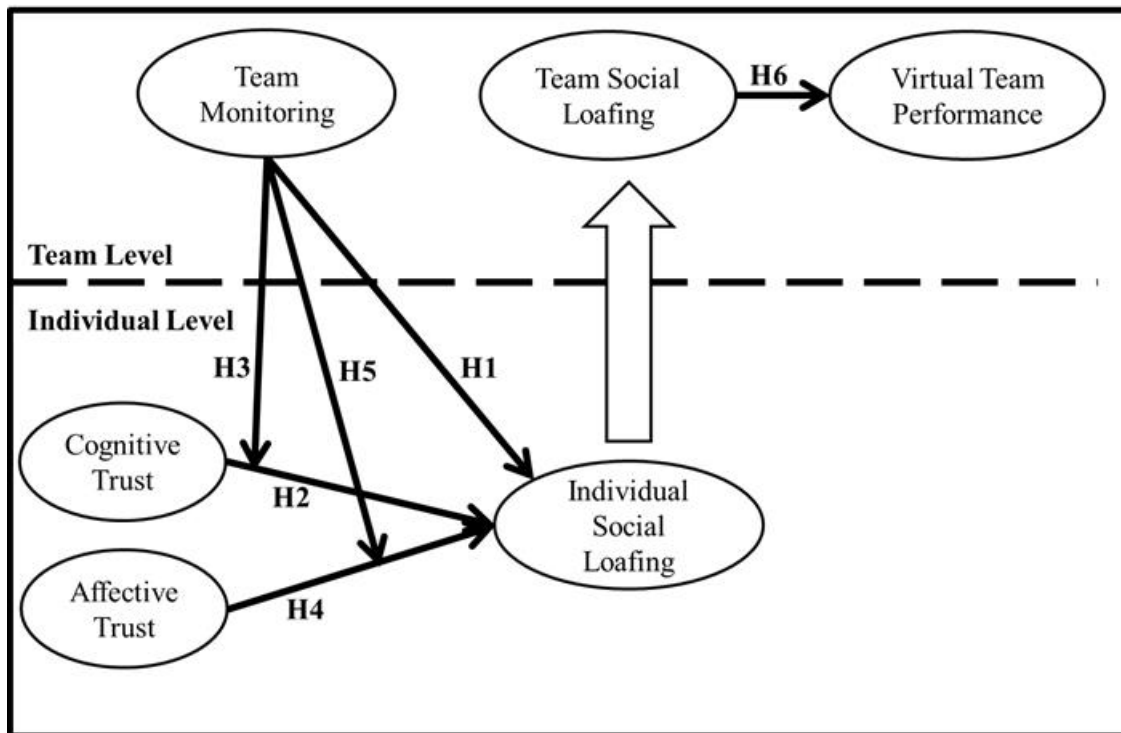
Figure 1. Theoretical model.

4. Research Model and Hypotheses

4.1. Team Monitoring and Individual Social Loafing

Team monitoring is one type of behavior control often employed in teams [4,14,60,61]. Team monitoring can be defined as the activity of tracking and assessing the work done by team members [4,60]. This process involves real-time assessments of performance discrepancies and the ability to provide corrective feedback [60–62]. Team monitoring can also be viewed as a coordination mechanism that can make teams aware of the actions, timing and performance of their teammates [6,63]. Although team monitoring has been associated with collocated teams in which members can directly observe the behavior of others, studies have also found that team monitoring can be carried out in virtual teams [3,4,13].

According to behavior–output control theory (BOCT), we should expect team monitoring to be negatively related to social loafing in virtual teams for several reasons. Team monitoring reduces social loafing by helping to ensure that team members are fulfilling their commitments to the team [63]. This is accomplished in part by identifying which members are not doing their share of the work [61]. This prevents members from hiding in the crowd [64]. This identification process reduces social loafing in virtual teams in several ways. It is very likely that virtual team members would like to avoid being identified as individuals who failed to fulfill their commitments to the team. The fear of being identified as a slacker has been found to lower the propensity of individuals to loaf [15,24]. In addition, by identifying the members who are not fulfilling their commitments, teams can engage in follow-up communications and inquiries. These follow-up communications and inquiries are likely to provide additional motivation for individual members who initially reneged on their commitments to follow through [63].

Team monitoring has additional benefits that could also reduce social loafing. It allows virtual team members to observe the work of their teammates. Research has found that team members are less likely to contribute to the team when they believe others are not contributing [15]. Conversely, team members are more inclined to exert more effort themselves when they believe others on their team are also contributing [8]. Team monitoring can highlight the efforts put forth by other team members, which, in turn, can encourage other team members to put forth more effort. As such,

individuals in virtual teams that monitor the actions of their team members are much less likely to experience social loafing. As such, we hypothesized:

Hypothesis 1. *Team monitoring is negatively related to individual social loafing in virtual teams.*

4.2. Cognitive-Based Trust and Individual Social Loafing

Cognitive-based trust is derived from individuals' assessment of their teammates' ability, integrity, reliability and responsibility [36,46]. This assessment is done through repeated interactions in which teammates either fulfill or fail to fulfill their commitments to the team [46]. Cognitive trust increases as teammates successfully follow through on their commitments and decreases as they fail to follow through on their commitments [1,11,35]. Over time, cognitive trust can develop to such a high level that no further evidence is needed or wanted to support it [42]. At such a level, individuals lose their motivation to process additional information about their teammates' actions [65].

One of the basic purposes of cognitive trust is to reduce the uncertainty embedded in many collaborative arrangements [40,66]. The need to depend on others is one of the key characteristics of teamwork, yet it creates a sense of uncertainty among collaborators [1]. This is often a result of the inability to determine who should be trusted and who should not [17]. Cognitive trust is one way to reduce this uncertainty, by allowing individuals to trust others and engage in collaborative activities [66]. As the uncertainty diminishes, individuals are much more willing to contribute and coordinate their efforts with others [40]. This explains why cognitive trust is often viewed as an important factor in teamwork [1].

Individuals' level of cognitive trust should be negatively related to their level of social loafing. The amount of effort team members are willing to contribute to their team's objectives depends on the amount of effort they believe their teammates are also contributing [22]. Team members are not likely to contribute much when they believe others will not fulfill or are incapable of fulfilling their commitments [22]. However, this is unlikely to occur when individuals have high levels of cognitive trust toward their teammates. As stated, cognitive trust develops as a result of successful interactions that demonstrate that others can and will fulfill their commitments [1]. These successful exchanges should promote the belief that teammates can and will do their share of the work [17,35,40,67]. Therefore, individuals high in cognitive trust should be more confident that their teammates will follow through on their roles and responsibilities. As a result, these individuals should be more willing to invest their energy and efforts toward their team's objectives, which should, in turn, reduce social loafing [40,63].

Cognitive trust might be particularly important in virtual teams. In virtual teams, members cannot often observe the actions of their teammates and they tend to assume the worst in the absence of information about their teammates' activities [68]. When individuals assume the worst, they are likely to contribute less and engage in social loafing [8]. However, high levels of cognitive trust allow these individuals to assume the best rather than the worst of their dispersed teammates. This positive assumption is likely to further decrease social loafing in virtual teams. Therefore, we would expect:

Hypothesis 2. *Individual cognitive trust is negatively related to individual social loafing in virtual teams.*

4.3. Team Monitoring, Cognitive-Based Trust and Individual Social Loafing

Team monitoring should moderate the relationship between individual cognitive trust and social loafing in virtual teams. The impacts of cognitive trust on social loafing appear to be similar to the impacts of team monitoring. Team monitoring reduces social loafing in part by demonstrating that others are following through on their commitments to the team [61]. Similarly, cognitive trust decreases social loafing by allowing individuals to assume that their teammates are following through on their commitments [63]. As such, we would expect that the relationship between cognitive trust and social loafing would depend on the degree of team monitoring.

The impact of cognitive trust should be diminished as team monitoring increases. This is because, the importance of being able to assume that others are doing their part should decrease

when that can actually be verified. When this occurs, virtual team members do not have to rely on cognitive trust to assume that others are working because they have direct evidence through the team's monitoring. Therefore, when virtual teams engage in team monitoring the relationship between individual cognitive trust and social loafing should weaken.

However, we would expect cognitive trust to be strongly associated with decreases in social loafing in virtual teams when team monitoring is low. In this circumstance, virtual team members do not have direct knowledge of what their teammates are doing and have to rely on cognitive-based trust to assume their teammates are following through. In this circumstance, individual cognitive trust should have a strong negative relationship with social loafing. As such, we suggest:

Hypothesis 3. *Team monitoring moderates the relationship between individual cognitive trust and individual social loafing in such a way that the strong negative relationship between individual cognitive trust and social loafing weakens when team monitoring is high.*

4.4. Affect-Based Trust and Individual Social Loafing

Empathy and the willingness to take on someone's problems are key characteristics of affective trust [39,69,70]. Affective trust emerges through repeated interactions that lead people to believe that another person genuinely cares about them personally [36,46]. During these interactions one party demonstrates caring by providing emotional and social support in times of trouble or distress [39]. Unlike cognitive trust, affective trust transcends work relationships and represents deep emotional connections between individuals [46,69,70]. This explains why relationships high in affective trust are often characterized by individuals willing to assume another's problems as their own and to provide assistance even if it is not requested [46].

However, affective trust can have drawbacks. At the team level, affective trust has been associated with more of a concern about maintaining good relations between members at the expense of team performance [28,71]. This occurs because team members in high affective trust are less willing to call out teammates for poor performance and instead assume the responsibility of others as their own [36,61]. Although these findings are at the team level, they may have significant implications for individuals with high affective trust.

Affect-based trust, like all types of trust, is often reciprocal [40,72]. This may be particularly true for affective trust [28]. Over time, individuals' trust in another is often based in part on the degree to which individuals believe the other party trusts them [73]. Individuals tend to assume that others have the same feeling and expectations toward them as they have toward others [73,74]. This means if individuals feel like others should be able to come to them with their personal problems and issues, they tend to feel that they can also go to others with their problems and issues [75]. If individuals assume that others should feel comfortable asking them to pick up some of their responsibilities and tasks when needed, they are also likely to expect others to take up some of their roles and responsibilities when needed [36,76].

An individual's level of affective trust should be positively related to his or her level of social loafing. Affective trust toward one's team is likely to be positively associated with the belief that one can go to teammates for additional assistance [76]. This additional assistance includes having others complete tasks and responsibilities when the individual cannot [36] . Team members high in affective trust feel open to ask for others to assist them when needed [39]. In many cases, these individuals are likely to believe their teammates will have little or no problem with picking up the slack on their behalf [75].

The belief that others are willing to assume one's additional duties is likely to drive the positive relationship between affect-based trust and social loafing. Research has shown that the belief that others will pick up the slack is a major cause of social loafing [15,25]. In particular, Alnuaimi et al. [8] found that individuals in virtual teams were more likely to engage in social loafing when they believed that other team members' efforts would more than make up the difference for their lack of effort. As a result, individuals with high levels of affective trust might be less likely to follow through

on their commitments and more likely to leave work for others to complete. Therefore, affective trust is likely to be positively associated with social loafing. As such, theory would suggest:

Hypothesis 4. *Individual affective trust is positively related to individual social loafing in virtual teams.*

4.5. Team Monitoring, Affect-Based Trust and Individual Social Loafing

Team monitoring should moderate the relationship between individual affective trust and social loafing. As stated, affective trust should be positively related to social loafing because individuals are likely to feel comfortable asking other team members to fulfill their own obligations. However, the relationship between individual affective trust and social loafing should decrease when team monitoring is high. The identification of those not fulfilling their commitments, provided by team monitoring, has several benefits that should reduce the positive relationship between affective trust and social loafing. One, it draws everyone's attention to the fact that someone is not fulfilling commitments [24]. This can make it less likely that other teammates will continue to fill in for the same individual who is not fulfilling team commitments. Although teammates are willing to step in when someone needs help, they might be less willing when they believe they are being taken advantage of by a teammate [25].

Another reason team monitoring would reduce the strong positive relationship between individual affective trust and social loafing is that it provides feedback to the individual engaging in social loafing about the behavior. Social loafing is not always a conscious decision to take advantage of one's teammates [21]. In fact, social loafing often occurs unconsciously, and when it does, individuals might not be aware that they are imposing themselves on their teammates [20]. Team monitoring is likely to make individuals engaging in social loafing aware of their behavior [63]. Team monitoring can provide feedback to individuals and their team about their level of effort. Research has shown that when individuals realize that their effort levels will (1) be made available to their teammates and (2) do not compare favorably to the efforts of their teammates, they are more likely to increase their effort, which should reduce social loafing [77,78]. Evidence of this assertion was indirectly found recently by Lount and Wilk [79]) in collocated work groups. They studied the productive level of employees who recruited participants for focus groups. They found that when individual performance was monitored and posted publicly, individuals in groups were more productive than individuals working alone. However, when individual performance was not monitored and made publicly available, individuals in groups were less productive than employees working alone. Therefore, team monitoring is likely to increase individuals' awareness of their social loafing. When they become aware, in many cases they reduce their imposition on their teammates. As such, we would expect:

Hypothesis 5. *Team monitoring moderates the relationship between individual affective trust and individual social loafing in such a way that the strong positive relationship between individual affective trust and social loafing weakens when team monitoring is high.*

4.6. Team Social Loafing and Virtual Team Performance

Team social loafing should be negatively related to the performance of virtual teams. Team social loafing should undermine performance for several reasons. In teams, members are assigned roles and responsibilities to facilitate team performance. Their roles and responsibilities contribute to the team's objectives and goals [80]. When social loafing is prevalent in teams, members fail to carry out their roles and complete their responsibilities [15,22]. This directly undermines the team's ability to accomplish its objectives and goals [27].

In addition, social loafing can indirectly reduce team performance by hindering the ability of team members who are not socially loafing to contribute to the team [19]. Team members who are motivated to complete their tasks are often reliant on the work of others [81]. Motivated team members in many cases need the output of other team members to complete their tasks. If these other members have failed to complete their part of the work process, the motivated individuals cannot in

many cases complete their tasks. As a result, this limits the ability of more motivated members to accomplish their roles and responsibilities, which should further decrease team performance.

The literature on social loafing in virtual teams has demonstrated the harmful effects of social loafing on team performance [9,24]. For example, Chidambaram and Tung [10] found that as individuals contributed less to the virtual team, their team made poorer decisions. Other research examining the impact of effort, the opposite of social loafing, has found strong positive effects between individual effort and team performance [22,82–84]. Therefore, it is reasonable to assume that a lack of effort could be negatively related to team performance. Taken together, theory and prior empirical evidence suggest that team social loafing should be negatively related to the performance of virtual teams.

Hypothesis 6. *Team social loafing is negatively related to the performance of virtual teams.*

5. Method

5.1. Participants

Participants were employees of an information technology service that supports third-party contractors. The organization participated in a study to determine the effectiveness of remote work. As part of their participation agreement, one of the researchers agreed to provide a white paper to members of the executive team. The organization's main focus was to provide information technology services and support for its clients. The service and support teams installed and maintained information systems in U.S. The employees worked remotely from home to address client issues online. When needed, some team members worked at a client's site temporarily. Because members of these teams were dispersed and relied on communication technology as their primary means of interaction, these teams were considered to be virtual teams. Therefore, the organization provided us with an opportunity to study organizational teams that were both dispersed and whose primary tasks focused on the information technology (IT) artifact. Two hundred seventy-two employees in 39 virtual teams participated in the study. Five teams were dropped from this sample because of a low response rate. The response rate was 82% across all teams that were not dropped. There were no differences between the five teams dropped due to low responses rate in terms of demographics and/or outcome variables.

5.2. Procedure

We administered two surveys to reduce multi-collinearity between the independent and dependent variables. The first survey was sent via email, was available for one month, and consisted of the control variables, individual trust and affective trust, along with items measuring team monitoring. The second survey was sent three months later and consisted of individual effort and individual performance items. Follow-up email reminders were sent to encourage participation for each survey.

5.3. Measures

All items used a seven-point Likert scale. The participants were assured that their responses would be kept confidential and that no identifiable information would be made available. The surveys employed well-established multi-item constructs. These items are shown in Tables 1 and 2.

Table 1. Individual factor loadings.

Item	1	2	3	4
He/She loafed by not doing their share of the tasks.	**0.96**	0.01	0.03	0.01
He/She by leaving work for others to do.	**0.95**	0.03	0.01	0.02
He/She loafed by goofing off.	**0.92**	0.16	0.01	0.03
He/She loafed by having other things to do when asked to help out	**0.93**	0.18	0.02	0.01
My team attempts to judge how well we are performing.	0.06	**0.78**	0.00	0.10
We pay attention to how this team performs.	0.10	**0.87**	0.18	0.10
My team monitors the actions of its members.	0.05	**0.87**	0.10	0.13
We pay attention to what people do on this team.	0.18	**0.88**	0.21	0.13
My team monitors what members do to make sure they comply.	0.20	**0.89**	0.19	0.23
My teammates approach their job with professionalism and dedication.	0.16	0.17	**0.89**	0.15
Given my teammates' track record, I see no reason to doubt anyone's level of ability.	0.15	0.16	**0.88**	0.18
I can rely on everyone on my team not to make my job more difficult by careless work.	0.12	0.17	**0.87**	0.17
Most people, even those who aren't on this team trust and respect my teammates.	0.18	0.19	**0.83**	0.18
Other work associates of mine who must interact with my teammates consider them to be trustworthy.	0.14	0.18	**0.79**	0.21
If people knew more about my teammates's background they would be more concerned about their performance?	0.13	0.22	**0.85**	0.21
I have a sharing relationship with my teammates.	0.03	0.11	0.12	**0.87**
I would feel a sense of loss if one of us was transferred and we could no longer work together.	0.16	0.14	0.15	**0.84**
I can talk freely to my teammates about difficulties I am having at work and know that they will want to listen.	0.02	0.19	0.19	**0.82**
If I share my problems with my teammates, I know s(he) would respond constructively and caringly.	0.10	0.13	0.20	**0.86**
I would have to say that we (my team) have made considerable emotional investments in our working relationship.	0.09	0.14	0.22	**0.83**

Table 2. Team factor loadings

Item	2	3	4	5
He/She loafed by not doing their share of the tasks.	0.03	0.02	0.06	0.07
He/She by leaving work for others to do.	0.02	0.01	0.02	0.02
He/She loafed by goofing off.	0.02	0.04	0.03	0.05
He/She loafed by having other things to do when asked to help out	0.06	0.00	0.03	0.12
I have a sharing relationship with my teammates.	**0.91**	0.13	0.00	0.22
I would feel a sense of loss if one of us was transferred and we could no longer work together.	**0.91**	0.08	0.03	0.18
I can talk freely to my teammates about difficulties I am having at work and know that they will want to listen.	**0.81**	0.07	0.12	0.15
If I share my problems with my teammates, I know s(he) would respond constructively and caringly.	**0.89**	0.06	0.05	0.18
I would have to say that we (my team) have made considerable emotional investments in our working relationship	**0.88**	0.22	0.11	0.16
This team was efficient in providing services and support to their clients.	0.03	**0.94**	0.08	0.07
This team was effective in providing services and support to their clients	0.06	**0.90**	0.10	0.01
This team met or exceeded my expectations in fulfilling its overall objectives.	0.06	**0.86**	0.04	0.03
My team attempts to judge how well we are performing.	0.04	0.00	**0.96**	0.03
We pay attention to how this team performs.	0.03	0.03	**0.91**	0.05
My team monitors the actions of its members.	0.06	0.01	**0.85**	0.05
We pay attention to what people do on this team.	0.06	0.02	**0.79**	0.03
My team monitors what members do to make sure they comply.	0.04	0.03	**0.87**	0.07
My teammates approach their job with professionalism and dedication.	0.13	0.07	0.03	**0.88**

Given my teammates' track record, I see no reason to doubt anyone's level of ability.	0.21	0.04	0.03	**0.83**
I can rely on everyone on my team not to make my job more difficult by careless work.	0.14	0.11	0.04	**0.74**
Most people, even those who aren't on this team trust and respect my teammates.	0.30	0.18	0.13	**0.78**
Other work associates of mine who must interact with my teammates consider them to be trustworthy.	0.11	0.07	0.05	**0.80**
If people knew more about my teammates's background they would be more concerned about their performance?	0.22	0.08	0.06	**0.85**

5.4. Control Variables

We used several control variables to reduce the possibility of alternative explanations. Control variables included team age, team size, and team tenure (life of the team). In addition, we used team monitoring, and team cognitive and affective trust as control variables while examining the impact of team social loafing.

5.5. Independent Variables

We collected the independent variables through a survey. We measured cognitive trust and affective trust using survey items from McAllister [36], and we measured team monitoring with items from Henderson and Lee [85]. These items included: "My team monitors the actions of its members" and "My team monitors what members do to make sure they comply." All scales used in this study were developed and validated by other researchers.

5.6. Dependent Variables

We measured individual social loafing with items adapted from Price et al. [15]. These items were obtained from peer ratings. Team members were given a list of all members of their team and asked to rate each individual. They rated each individual on items such as "he/she loafed by not doing their share of the tasks" or "he/she loafed by having other things to do when asked to help out." All items are shown in Table 1. We calculated team social loafing by aggregation of all the individuals in a team. Team performance was determined by supervisor ratings. The supervisor rated the team on three items: "This team was efficient in providing services and support to its clients," "This team was effective in providing services and support to its clients," and "This team met or exceeded my expectations in fulfilling its overall objectives." Team performance ranged from 0 (worst) to 7 (best); the overall reliability of items measuring team performance was 0.82.

6. Results

The psychometric properties of the measure model were first assessed in Table 1 (individual level) and Table 2 (team level). Table 2 presents the constructs at the team level via aggregation. Table 2 is included to demonstrate the psychometric properties of the constructs at the team level. We assessed convergent and discriminant validity using exploratory factor analysis (EFA). All loadings were greater than 0.80 and cross-loadings were less than 0.22 (see Tables 1 and 2), suggesting convergent validity within scales and discriminant validity across scales [86]. All multi-item measurement scales in Table 3 (individual level) and Table 4 (team level) showed high reliability, with Cronbach alpha scores equal or greater than 0.7. We also assessed discriminant and convergent validity by examining the square root of the average variance shared (AVE). The correlation matrix is shown in Tables 3 and 4. The square root of the average variance shared (AVE) is shown along the diagonals. An indication of adequate discriminant is that the items of a construct should share more variance internally than with other constructs in the model [86]. All constructs have AVEs of 0.5 or higher, which indicates an acceptable level of convergent validity. In these tables, the AVE of each construct is larger than its corresponding row and column correlations, indicating adequate discriminant validity.

Table 3. Individual means, standard deviations, reliabilities, and correlations for the multiple level analysis.

Variable	Mean	Std. Dev.	Reliability	1	2	3	4	5	6	7	8
Individual Age	**37.57**	**6.00**	**N/A**	**N/A**							
Individual Affect Based Trust	4.24	1.41	0.85	0.07	(.75)						
Individaul Cognitive Trust	4.95	1.33	0.88	0.08	0.63 **	(.76)					
Individual Social Loafing	2.00	1.09	0.91	-0.18	-0.20 **	-0.50 **	0.83				
Individual Tenure	4.80	0.57	N/A	0.23 *	0.13 *	0.28 **	-0.19 **	N/A			
Team Monitoring	4.68	0.96	0.90	0.04	0.36 **	0.51 **	-0.40 **	0.24 **	(.77)		
Team Size	8.90	0.72	N/A	0.03	-0.17 **	-0.08	0.15 *	-0.15 *	-0.33 **	N/A	
Team Tenure	1.50	0.71	N/A	-0.11	0.11 **	-0.06	0.02	-0.18 **	0.07	-0.22 **	N/A

Notes: 1. Average Variance Extracted squared (AVE) in on the diagonal.
2. Significance of correlations: **p<.01; *p<.05
3. N = 272

Table 4. Team means, standard deviations, reliabilities, and correlations for the team analysis.

Variable	Mean	Std. Dev.	Reliability	1	2	3	4	5	6	7
Team Affect-Based Trust	**4.25**	**0.89**	**0.95**	**(.78)**						
Team Cognitive Trust	4.96	0.97	0.90	0.57 **	(.66)					
Team Monitoring	4.70	0.96	0.94	0.56 **	0.67 **	(.77)				
Team Performance	5.88	0.80	0.93	0.31 *	0.54 **	0.44 **	(.80)			
Team Size	8.90	0.72	N/A	-0.25 *	0.10	-0.28 *	-0.04	N/A		
Team Social Loafing	2.00	0.74	0.92	-0.35 *	-0.66 **	-0.55 **	-0.54 **	0.20	(.87)	
Team Tenure	1.50	0.71	N/A	0.17	-0.09	0.06	-0.09	-0.21	0.02	N/A

Notes: 1. Average Variance Extracted (AVE) in on the diagonal.
2. Significance of correlations: **p<.01; *p<.05
3. N = 39

Individuals were nested within a team, which implies that error terms are likely to be related. This violates at least one of the assumptions of ordinary least squared. Therefore, it was necessary to use an analytic technique that recognizes that each case is not independent [87]. We used SPSS 22 mixed-model package (IBM, Armonk, NY) to perform hierarchical linear modeling (HLM). HLM accounts for the nested nature of the data. All continuous variables were standardized, as suggested by Aiken and West [88], to reduce multi-collinearity. All data were obtained at the individual level. All team-level constructs resulted from the aggregation of individual responses. Therefore, we calculated an intra-class correlation coefficient (ICC) for each construct. All ICCs were above 0.27, justifying the aggregation [87].

We analyzed both individual social loafing and team performance using three models. Model 1 included only the control variables. Model 2 tested the main effects, which included the control variables along with the theoretical variables. Model 3 included the moderation effects. Overall, the final model explained 57% of the variance for individual social loafing, as shown in Table 5. The addition of the moderation effects explained a significant amount of the variance. The final model explaining team performance accounted for 38% of the variance, as shown in Table 6. We review the hypotheses in the following paragraph.

Table 5. Results of multi-level analysis: individual social loafing.

Independent Variables	Individual Social Loafing		
	1	2	3
Control Variables			
Team Size	0.06	−0.06	−0.05
Team Tenure	−0.16	−0.10	−0.01
Individual Organization Tenure	−0.30	−0.11	−0.16
Individual Age	−0.11	−0.09	−0.08
Main Effects (Level 1)			
Individual Affect Trust		0.18 *	0.15
Individual Cognitive Trust		−0.23 *	−0.12
Main Effects (Level 2)			
Team Monitoring		−0.38 **	−0.35 **
Moderation Effects (Cross Level)			
Team Monitoring X Individual Affect Trust			−0.25 *
Team Monitoring X Individual Cognitive Trust			0.33 ***
−2 Restricted Log Likelihood	379	362	347
Deviance Difference		17	15
df		3	2
R^2	2%	44%	57%
Change R^2		42%	13%

*: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$.

Table 6. Results of team-level analysis: team performance.

Independent Variables	Virtual Team Performance		
	1	2	3
Control Variables			
Team Size	−0.14	−0.07	−0.08
Team Tenure	−0.06	0.05	0.11
Team Age	0.44	0.21	0.02
Team Monitoring		0.32	0.14
Team Affective Trust		−0.05	−0.01
Team Cognitive Trust		0.17 *	0.15
Main Effect			

Team Social Loafing			−0.36 *
R²	9%	32%	38%
Change R²		28%	6%

* $p < 0.05$, ** $p < 0.01$.

Hypothesis 1, team monitoring is negatively related to individual social loafing, was supported ($\beta = -0.38$; $p < 0.01$). Hypothesis 2, individual cognitive trust is negatively related to individual social loafing, was supported ($\beta = -0.23$; $p < 0.05$). Hypothesis 3, team monitoring moderates the relationship between individual cognitive trust and individual social loafing, was supported ($\beta = 0.33$; $p < 0.001$). The moderation effect is seen in Figure 2. Hypothesis 4, individual affective trust is positively related to individual social loafing, was supported ($\beta = 0.18$; $p < 0.05$). Hypothesis 5, team monitoring moderates the impact of individual affective trust on individual effort, was supported ($\beta = -0.25$; $p < 0.05$). The moderation effect is seen in Figure 3. Hypothesis 6, team social loafing is negatively related to virtual team performance, was also supported ($\beta = -0.36$; $p < 0.05$).
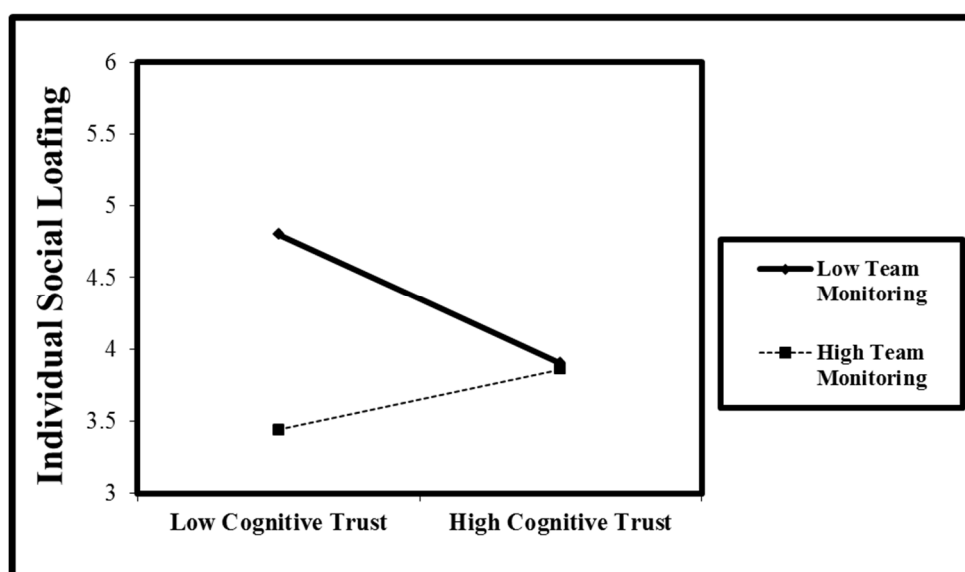

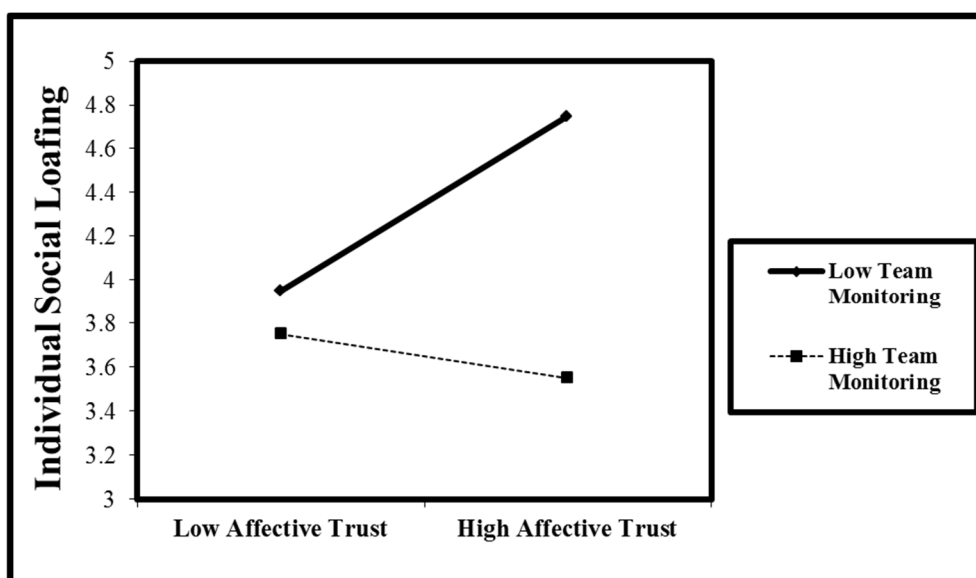**Figure 2.** Moderation effect between team monitoring and individual cognitive trust.

Figure 3. Moderation effect between team monitoring and individual affect trust.

7. Discussion

The objective of this study was to determine the effect of controls and trust on social loafing in virtual teams. We proposed and found that the type of trust is important to understanding how control alters the impact of trust on individual social loafing in virtual teams. Results of this study indicate that the type of trust is important to understanding the influence of team control. In this study, we also found that team social loafing is negatively related to the performance of virtual teams. In doing so, this study provides insights over and above previous studies on social loafing in virtual teams. The following paragraphs delineate the study's implications for theory and research.

This study makes several contributions to the literature. First, this study contributes to research on social loafing in virtual teams in two ways. One, the results of this study demonstrate how control and trust can be used to reduce social loafing in virtual teams. Contrary to prior assumptions, virtual teams can and do employ social controls and can rely on trust, at least cognitive trust, to reduce social loafing. In this study, both team monitoring and cognitive trust were associated with reductions in social loafing in virtual teams. However, affective trust was associated with increases in social loafing in virtual teams. Two, this study is the first to examine social loafing in a field setting, and in doing so it found that social loafing in virtual teams reduces team performance. This is important because prior researchers focused more on controlled laboratory experiments and examined only one particular type of task: brainstorming. Our research contributes to the literature by examining social loafing in a field environment, thereby complementing the existing literature on social loafing in virtual teams.

Second, this study contributes to our understanding of the effects of control in virtual teams. Research on behavior controls in virtual teams has focused on whether they facilitate or hinder the development of trust in virtual teams. Research has also demonstrated the potential of controls to alter team members' behavior and attitudes in virtual teams [3,4,13,49], therefore, research is needed to understand the influence that controls can have on social loafing in virtual teams. This study highlights the important role that control can have on reducing social loafing in virtual teams. Team monitoring was negatively related to social loafing, while its moderating effects had positive effects for virtual teams. Team monitoring substituted for cognitive trust and also reduced the negative effects of affect-based trust. Although the effects of team monitoring on trust are complicated [4], team monitoring seems to have clear benefits for reducing social loafing in virtual teams.

Finally, this study contributes to the literature on trust in virtual teams. Results indicate that the type of trust is important to understanding the relationship between trust and social loafing in virtual teams. Likewise, team monitoring is also important to understanding the influence of team control. Individual cognitive trust was associated with decreases in social loafing, while affect-based trust was associated with increases in social loafing in virtual teams. As such, the results of this study demonstrate how problematic affect-based trust can be for virtual teams. In addition, much of the research on trust in virtual teams has been directed at understanding how trust can be developed in virtual environments [4,11–13,49]. However, scholars have called for further research on understanding the conditions that determine the effectiveness of trust [17,89]. Results of this study demonstrate that control can dictate the effectiveness of trust.

7.1. Limitations and Future Research

Before discussing the implications of our findings, it is important to acknowledge several limitations of this study. One limitation of this study concerns internal validity. Measures were gathered through self-reports at a single point in time, signifying a possible problem with common method variance. A review of Tables 3 and 4 indicates that correlations were varied across constructs. In addition, the outcome variables were collected on a different survey at a different point in time. This provides some level of separation between the independent and outcome variables. A Harman single factor test was conducted and only 32% of the variance loaded on the first factor. This provides evidence that common method bias was not a significant issue. Two, this paper did not examine the possibility that team monitoring could also increase cognitive trust; but once cognitive trust is developed, the influence of team monitoring might become less important. Future research should

be conducted to explore how time changes such relationships. Three, this study did not explicitly examine the impacts of the degree of virtuality. Teams in this study worked primarily from home remotely. However, it is possible that team members could have met face to face [90–92]. According to Cohen and Gibson [90] and Robert and You [91] virtuality should be viewed as a matter of degree ranging from completely virtual to completely face to face with a wide spectrum between the two. Future research should can explore how virtuality itself might impact both the development of controls like monitoring as well as their impact on team trust. Finally, the measure of team social loafing was calculated by aggregating items which used the individual as a reference rather than the team. Tt is not clear how different the measure would have been if the team was the reference. Nonetheless, the use of a team as the reference would have been more appropriate.

7.2. Practical Implications

The study has several implications for managers. Managers should encourage the development of team monitoring and cognitive trust. Managers could provide feedback to facilitate the development of cognitive trust. Managers should be particularly concerned with teams that may have developed high levels of affective trust and do not engage in monitoring. In these situations, managers might have to consider interventions to encourage team monitoring or dissolve such teams.

7.3. Implications for Research

This study has several implications for research. One, it provides evidence of the potential benefits of team controls and cognitive trust in virtual teams. Although researchers have examined how trust develops in virtual teams, our understanding of how virtual teams develop social controls is underdeveloped. Kirsch et al. [52] found that social capital and behavior observability are important predictors of whether collocated teams develop social controls. If dispersion hampers the development of social capital and the ability to observe behavior, dispersion might indirectly reduce the ability of virtual teams to develop social controls. Yet, Crisp and Jarvenpaa [3] and our study have confirmed that virtual teams can and do develop controls. Therefore, future studies should examine the influence of dispersion on the development of social controls and identify what factors, if any, help virtual teams compensate for problems associated with dispersion. Results could help us understand how to promote social controls in virtual teams.

Two, results of this study indicate that the type of trust is important to understanding its influence on social loafing. Previous studies exploring the topic of trust in virtual teams, with the exception of Kanawattanachai and Yoo [46], have not differentiated between cognitive- and affect-based trust [3,4,13,56]. Yet, this study clearly shows how important it is to differentiate the two. In fact, cognitive- and affect-based trust seem to have opposite and offsetting impacts on social loafing. If this study did not differentiate between the types of trust, the relationship between trust and social loafing could have been non-significant. This would have suppressed the important impact of trust on social loafing. Therefore, future studies should pay particular attention to the types of trust when investigating their relationship with social loafing.

Three, like prior studies employing behavior–output control theory (BOCT) in virtual teams, we examined only one type of behavior control: team monitoring [3,4,13,56]. However, in addition to the many types of behavior controls, there are many types of output controls. When we consider the strong influence of team monitoring on social loafing, other types of controls might have similar effects on social loafing. Yet, the literature has examined only one type of behavior control. As such, we know very little about the role that other types of behavior or output controls play in virtual teams. Research should be done to determine the effects of output controls and other types of behavior controls in virtual teams. This would represent a significant contribution to the literature on controls.

Finally, our study demonstrates the important effects of control and trust in virtual teams. Yet, studies examining the effects of control and trust have typically focused on how one impacts the other. Less is known about their potential impact on other important team relationship variables like establishing norms and forming team identity. In addition, controls and trust are often used to

promote coordination in collocated teams [3,4,13,56]. Yet, there is much to learn about how controls and trust can be used to promote coordination in virtual teams. Studies should examine how controls and trust could be used to promote better team relationships and coordination in virtual teams.

8. Conclusions

Social loafing is an important problem for virtual teams. Reasons cited include a lack of social control, the inability to observe or trust that others are working, geographic dispersion, and the reliance on electronic communications. Yet we know very little about the effects of control and trust on social loafing in virtual teams. The results of this study indicate that the key to understanding the relationship among control, trust, and social loafing in virtual teams begins with considering the type of trust. This study provides new insights into social loafing in virtual teams.

Conflicts of Interest: The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results

References

1. Robert, L.P.; Dennis, A.R.; Hung, Y.C. Individual swift trust and knowledge-based trust in face-to-face and virtual team members. *J. Manag. Inf. Syst.* **2009**, *26*, 241–279.
2. Ye, T.; Robert, L.P. Does Collectivism Inhibit Individual Creativity? The Effects of Collectivism and Perceived Diversity on Individual Creativity & Satisfaction in Virtual Ideation Teams. In Proceedings of the 20th ACM Conference on Computer Supported Cooperative Work and Social Computing, Portland, OR, USA, 25 February–1 March 2017; doi:10.1145/2998181.2998261.
3. Crisp, C.B.; Jarvenpaa, S.L. Swift trust in global virtual teams: Trusting beliefs and normative actions. *J. Pers. Psychol.* **2013**, *12*, 45–56.
4. Dennis, A.R.; Robert, L.P.; Curtis, A.M.; Kowalczyk, S.T.; Hasty, B.K. Trust is in the eye of the beholder: A vignette study of postevent behavioral controls' effects on individual trust in virtual teams. *Inf. Syst. Res.* **2012**, *23*, 546–558.
5. Hoch, J.E.; Kozlowski, S.W.J. Leading virtual teams: Hierarchical leadership, structural supports, and shared team leadership. *J. Appl. Psychol.* **2012**, *9*, 390–403, doi:10.1037/a0030264.
6. Kim, S.; Robert, L.P. Crowdsourcing Coordination: A Review and Research Agenda for Crowdsourcing Coordination used for Macro-tasks. In *Macro-Task Crowdsourcing: Engaging the Crowds to Address Complex Problems*; Khan, J., Lykourentzou, I., Papangelis, K., Markopoulos, P.; Eds.; Springer Human Computer Interaction Series; Springer Nature Switzerland AG: Cham, Switzerland, 2019, doi:10.1007/978-3-030-12334-5_2.
7. Koutsombogera, M.; Vogel, C. Observing Collaboration in Small-Group Interaction. *Multimodal Technol. Interact.* **2019**, *3*, 45.
8. Alnuaimi, O.A.; Robert, L.P., Jr.; Maruping, L.M. Team size, dispersion, and social loafing in technology-supported teams: A perspective of theory of moral disengagement. *J. Manag. Inf. Syst.* **2010**, *27*, 209–236.
9. Blaskovich, J.L. Exploring the effect of distance: An experimental investigation of virtual collaboration, social loafing, and group decisions. *J. Inf. Syst.* **2008**, *22*, 27–46.
10. Chidambaram, L.; Tung, L.L. Is out of sight, out of mind? An empirical study of social loafing in technology-supported groups. *Inf. Syst. Res.* **2005**, *16*, 149–168.
11. Jarvenpaa, S.L.; Knoll, K.; Leidner, D. Is anybody out there? Antecedents of trust in global virtual teams. *J. Manag. Inf. Syst.* **1998**, *14*, 29–64.
12. Jarvenpaa, S.L.; Leidner, D.E. Communication and trust in global virtual teams. *Organ. Sci.* **1999**, *10*, 791–815.
13. Piccoli, G.; Ives, B. Trust and the unintended effects of behavior control in virtual teams. *Manag. Inf. Syst. Q.* **2003**, *27*, 365–395.

14. Robert, L.P. Monitoring and Trust in Virtual Teams. In *Proceedings of the 19th ACM Conference on Computer Supported Cooperative Work and Social Computing*; Association for Computing Machinery: New York, NY, USA, 2016; pp. 245–259, doi:10.1145/2818048.2820076.

15. Price, K.H.; Harrison, D.A.; Gavin, J.H. Withholding inputs in team contexts: Member composition, interaction processes, evaluation structure, and social loafing. *J. Appl. Psychol.* **2006**, *91*, 1375–1384.

16. Hanna, N.; Richards, D. The Impact of Multimodal Communication on a Shared Mental Model, Trust, and Commitment in Human–Intelligent Virtual Agent Teams. *Multimodal Technol. Interact.* **2018**, *2*, 48.

17. Jarvenpaa, S.I.; Shaw, T.R.; Staples, D.S. Toward contextualized theories of trust: The role of trust in global virtual teams. *Inf. Syst. Res.* **2004**, *15*, 250–267.

18. Ringelmann, M. [Research on animate sources of power: The work of man]. *Ann. De L'institut Natl. Agron.* **1913**, *2*, 1–40.

19. George, J.M. Extrinsic and intrinsic origins of perceived social loafing in organizations. *Acad. Manag. J.* **1992**, *35*, 191–202.

20. Karau, S.J.; Williams, K.D. Understanding individual motivation in groups: The collective effort model. In *Groups at Work: Theory and Research*; Turner, M.E., Ed.; Lawrence Erlbaum Associates: Mahwah, NJ, USA, 2001; pp. 113–141.

21. Latane, B.; Williams, K.; Harkins, S. Many hands make light the work: The causes and consequences of social loafing. *J. Personal. Soc. Psychol.* **1979**, *47*, 822–832.

22. Liden, R.C.; Wayne, S.J.; Jaworski, R.A.; Bennett, N. Social loafing: A field investigation. *J. Manag.* **2004**, *30*, 285–304.

23. Monzani, L.; Ripoll, P.; Peiró, J.M.; Van Dick, R. Research report: Loafing in the digital age: The role of computer mediated communication in the relation between perceived loafing and group affective outcomes. *Comput. Hum. Behav.* **2014**, *33*, 279–285.

24. Suleiman, J.; Watson, R.T. Social loafing in a technology-supported team. *Comput. Supported Coop. Work* **2008**, *17*, 291–309.

25. Karau, S.J.; Williams, K.D. Social loafing: A meta-analytic review and theoretical integration. *J. Personal. Soc. Psychol.* **1993**, *65*, 681–706.

26. Valacich, J.S.; George, J.F.; Nunamaker, J.F.; Vogel, D.R. Physical proximity effects on computer-mediated group idea generation. *Small Group Res.* **1994**, *25*, 83–104.

27. Valacich, J.S.; Wheeler, B.C.; Mennecke, B.E.; Wachter, R.M. The effects of numerical and logical group size on computer mediated idea generation. *Organ. Behav. Hum. Decis. Process.* **1995**, *62*, 318–329.

28. Molina-Morales, F.X.; Martínez-Fernández, M.T. Too much love in the neighborhood can hurt: How an excess of intensity and trust in relationships may produce negative effects on firms. *Strateg. Manag. J.* **2009**, *30*, 1013–1023.

29. Perry, S.J.; Lorinkova, N.M.; Hunter, E.M.; Hubbard, A.; McMahon, J.T. When does virtuality really "work"? Examining the role of work–family and virtuality in social loafing. *J. Manag.* **2013**, *42*, 449–479, doi:10.1177/0149206313475814.

30. Shepherd, M.M.; Briggs, R.O.; Reinig, B.A.; Yen, J.; Nunamaker, J.F. Invoking social comparison to improve electronic brainstorming: Beyond anonymity. *J. Manag. Inf. Syst.* **1995**, *12*, 155–170.

31. Roy, M.C.; Gauvin, S.; Limayem, M. Electronic group brainstorming the role of feedback on productivity. *Small Group Res.* **1996**, *27*, 215–247.

32. Pissarra, J.; Jesuino, J.C. Idea generation through computer-mediated communication: The effects of anonymity. *J. Manag. Psychol.* **2005**, *20*, 275–291.

33. McLeod, P.L. Effects of anonymity and social comparison of rewards on computer-mediated group brainstorming. *Small Group Res.* **2011**, *42*, 475–503.

34. Aubert, B.A.; Kelsey, B.L. Further understanding of trust and performance in virtual teams. *Small Group Res.* **2003**, *34*, 575–618.

35. Mayer, R.C.; Davis, J.H.; Schoorman, F.D. An integrative model of organizational trust. *Acad. Manag. Rev.* **1995**, *20*, 709–734.

36. McAllister, D.J. Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Acad. Manag. J.* **1995**, *38*, 24–59.

37. Dirks, K.T. The effects of interpersonal trust on work group performance. *J. Appl. Psychol.* **1999**, *84*, 445–455.

38. Paul, D.L.; McDaniel, R.R. A field study of the effects of interpersonal trust on virtual collaborative performance. *Manag. Inf. Syst. Q.* **2004**, *28*, 183–227.

39. Schaubroeck, J.; Lam, S.S.K.; Peng, A.C. Cognition-based and affect-based trust as mediators of leader behavior influences on team performance. *J. Appl. Psychol.* **2011**, *96*, 863–871.

40. Jones, G.R.; George, J.M. The experience and evolution of trust: Implications for co-operation and teamwork. *Acad. Manag. Rev.* **1998**, *23*, 531–546.

41. Johnson, D.; Grayson, K. Cognitive and affective trust in service relationships. *J. Bus. Res.* **2005**, *58*, 500–507.

42. Lewis, J.D.; Weigert, A. Trust as a social reality. *Soc. Forces* **1985**, *63*, 967–985.

43. Erdem, F.; Ozen, J. Cognitive and affective dimensions of trust in developing team performance. *Team Perform. Manag.* **2003**, *9*, 131–135.

44. Breuer, C.; Hüffmeier, J.; Hertel, G. Does trust matter more in virtual teams? A meta-analysis of trust and team effectiveness considering virtuality and documentation as moderators. *J. Appl. Psychol.* **2016**, *101*, 1151–1177, doi:10.1037/apl0000113.

45. De Jong, B.A.; Dirks, K.T.; Gillespie, N. Trust and team performance: A meta-analysis of main effects, moderators, and covariates. *J. Appl. Psychol.* **2016**, *101*, 1134–1150, doi:10.1037/apl0000110.

46. Kanawattanachai, P.; Yoo, Y. Dynamic nature of trust in virtual teams. *J. Strateg. Inf. Syst.* **2002**, *11*, 187–213.

47. Cardinal, L.B.; Kreutzer, M.; Miller, C.C. An aspirational view of organizational control research: Re-invigorating empirical work to better meet the challenges of 21st century organizations. *Acad. Manag. Ann.* **2017**, *11*, 559–592.

48. Ouchi, W.G. A conceptual framework for the design of organizational control mechanisms. *Manag. Sci.* **1979**, *5*, 833–848.

49. Robert, L.P. Crowdsourcing Controls: A Review and Research Agenda for Crowdsourcing Controls used for Macro-Tasks. In *Macro-task Crowdsourcing: Engaging the Crowds to Address Complex Problems*; Khan, J., Lykourentzou, I., Papangelis, K., Markopoulos, P.; Eds.; Springer Human Computer Interaction Series; Springer Nature Switzerland AG: Cham, Switzerland, 2019; doi:10.1007/978-3-030-12334-5_3.

50. Cravens, D.W.; Ingram, T.N.; LaForge, R.W.; Young, C.E. Behavior-based and outcome-based salesforce control systems. *J. Mark.* **1993**, *57*, 47–59.

51. Kirsch, L.J. The management of complex tasks in organizations: Controlling the systems development process. *Organ. Sci.* **1996**, *7*, 1–21.

52. Kirsch, L.J.; Ko, D.-G.; Haney, M.H. Investigating the antecedents of team-based clan control: Adding social capital as a predictor. *Organ. Sci.* **2010**, *21*, 469–489.

53. Choudhury, V.; Sabherwal, R. Portfolios of control in outsourced software development projects. *Inf. Syst. Res.* **2003**, *14*, 291–314.

54. Kirsch, L.J. Portfolios of control modes and IS project management. *Inf. Syst. Res.* **1997**, *8*, 215–239.

55. Nidumolu, S.R.; Subramani, M.R. The matrix of control: Combining process and structure approaches to managing software development. *J. Manag. Inf. Syst.* **2004**, *20*, 159–197.

56. Piccoli, G.; Powell, A.; Ives, B. Virtual teams: Team control structure, work processes, and team effectiveness. *Inf. Technol. People* **2004**, *17*, 359–379.

57. Rustagi, S.; King, W.R.; Kirsch, L.J. Predictors of formal control usage in IT outsourcing partnerships. *Inf. Syst. Res.* **2008**, *19*, 126–143.

58. Maruping, L.M.; Venkatesh, V.; Agarwal, R. A control theory perspective on agile methodology use and hanging user requirements. *Inf. Syst. Res.* **2009**, *20*, 377–399.

59. Tiwana, A.; Keil, M. Control in internal and outsourced software projects. *J. Manag. Inf. Syst.* **2010**, *26*, 9–45.

60. De Jong, B.A.; Dirks, K.T. Beyond shared perceptions of trust and monitoring in teams: Implications of asymmetry and dissensus. *J. Appl. Psychol.* **2012**, *97*, 391–406.

61. Langfred, C.W. Too much of a good thing? The negative effects of high trust and autonomy in self-managing teams. *Acad. Manag. J.* **2004**, *47*, 385–399.

62. Marks, M.A.; Mathieu, J.E.; Zaccaro, S.J. A temporally based framework and taxonomy of team processes. *Acad. Manag. Rev.* **2001**, *26*, 356–376.

63. De Jong, B.A.; Elfring, T. How trust affects performance of ongoing teams. *Acad. Manag. J.* **2010**, *53*, 535–549.

64. Davis, J.H. *Group Performance*; Addison-Wesley: Reading, MA, USA, 1969.

65. Hung, Y.T.; Dennis, A.R.; Robert, L. Trust in virtual teams: Towards an integrative model of trust formation. In Proceedings of the 37th Annual Hawaii International Conference on System Sciences, Big Island, HI, USA, 5–8 January 2004; p. 11.

66. Luhmann, N. *Trust and Power*; Wiley: New York, NY, USA, 1979.

67. Munson, S.; Kervin, K.; Robert, L.P. Monitoring Email to Indicate Project Team Performance and Mutual Attraction. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work and Social Computing*; Association for Computing Machinery: New York, NY, USA 2014; pp. 542–549, doi:10.1145/2531602.2531628.

68. Cramton, C.D. The mutual knowledge problem and its consequences in geographically dispersed teams. *Organ. Sci.* **2001**, *12*, 346–371.

69. Webber, S.S. Development of cognitive and affective trust in teams: A longitudinal study. *Small Group Res.* **2008**, *39*, 746–769.

70. Williams, M. In whom we trust: Group membership as an affective context for trust development. *Acad. Manag. Rev.* **2001**, *26*, 377–396.

71. Bidault, F.; Castello, A. Why too much trust is death to innovation. *MIT Sloan Manag. Rev. Summer* **2010**, *51*, 33–38.

72. Butler, J.K. Reciprocity of trust between professionals and their secretaries. *Psychol. Rep.* **1983**, *53*, 411–416.

73. Yakovleva, M.; Reilly, R.R.; Werko, R. Why do we trust? Moving beyond individual to dyadic perceptions. *J. Appl. Psychol.* **2010**, *95*, 79–91.

74. Serva, M.A.; Fuller, M.A.; Mayer, R.C. The reciprocal nature of trust: A longitudinal study of interacting teams. *J. Organ. Behav.* **2005**, *26*, 625–648.

75. Koster, F.; Sanders, K. Organisational citizens or reciprocal relationships? An empirical comparison. *Pers. Rev.* **2006**, *35*, 519–537.

76. Porter, C.E.; Donthu, N. Cultivating trust and harvesting value in virtual communities. *Manag. Sci.* **2008**, *54*, 113–128.

77. Harkins, S.; Jackson, J. The role of evaluation in eliminating social loafing. *Personal. Soc. Psychol. Bull.* **1985**, *11*, 457–465.

78. Hüffmeier, J.; Dietrich, H.; Hertel, G. Effort intentions in teams: Effects of task type and teammate performance. *Small Group Res.* **2013**, *44*, 62–88.

79. Lount, R.B.; Wilk, S.L. Working harder or hardly working? Posting performance eliminates social loafing and promotes social laboring in workgroups. *Manag. Sci.* **2014**, *60*, 1098–1106.

80. Hoegl, M.; Gemuenden, H.G. Teamwork quality and the success of innovative projects: A theoretical concept and empirical evidence. *Organ. Sci.* **2001**, *12*, 435–449.

81. Van der Vegt, G.S.; Emans, B.J.M.; Van der Vliert, E. Patterns of interdependence in work teams: A two-level investigation of the relations with job and team satisfaction. *Pers. Psychol.* **2001**, *54*, 51–69.

82. Brown, S.P.; Leigh, T.W. A new look at psychological climate and its relationship to job involvement, effort, and performance. *J. Appl. Psychol.* **1996**, *81*, 358–368.

83. Hackman, J.R. The design of work teams. In *Handbook of Organizational Behavior*; Lorsch, J., Ed.; Prentice-Hall: Englewood Cliffs, NJ, USA, 1987; pp. 315–342.

84. Jung, J.H.; Schneider, C.; Valacich, J. Enhancing the motivational affordance of information systems: The effects of real-time performance feedback and goal setting in group collaboration environments. *Manag. Sci.* **2010**, *56*, 724–742.

85. Henderson, J.C.; Lee, S. Managing IS design teams: A control theories perspective. *Manag. Sci.* **1992**, *38*, 757–777.

86. Fornell, C.; Larcker, D.F. Evaluating structural equations models with unobservable variables and measurement error. *J. Mark. Res.* **1981**, *18*, 39–50.

87. Bliese, P.D. Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions*; Klein, K.J., Kozlowski, S.W.J., Eds.; Jossey-Bass: San Francisco, CA, USA, 2000; pp. 349–381.

88. Aiken, L.S.; West, S.G. *Multiple regression: Testing and Interpreting Analysis Interactions*; Sage: Newbury Park, CA, USA, 1991.

89. Dirks, K.T.; Ferrin, D.L. Trust in leadership: Meta-analytic findings and implications for organizational research. *J. Appl. Psychol.* **2002**, *87*, 611–628.

90. Cohen and Gibson. In the beginning; introduction and framework. In *Virtual Teams that Work: Creating Conditions for Virtual Team Effectiveness*; Gibson, C.B., Cohen, S.G. Eds.; Jossey-Bass: San Francisco, CA, USA, 2003.

91. Robert, L.P.; You, S. Disaggregating the impacts of virtuality on team identification. In Proceedings of the 2018 ACM Conference on Supporting Groupwork, Sanibel Island, FL, USA, 7–10 January, 2018; pp. 309–321.

92. Robert, L.P.; Dennis, A.R.; Ahuja, M. Differences are Different: Examining the Effects of Communication Media on the Impacts of Racial and Gender Diversity in Decision-Making Teams. *Inf. Syst. Res.* **2018**, *29*, 525–545, doi:10.1287/isre.2018.0773.