

# Suddenly Virtual? Potentials and Limits of Video-Based Social Software with regard to Social Isolation among Office Workers in Times of COVID-19

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**Abstract:** This paper addresses the issue of loneliness among office workers who have suddenly been forced to work from home in the context of the global COVID-19 pandemic. The aim is to find out whether the use of video-based social software can counter-act the feeling of loneliness. An online survey with 381 participants showed that video-based social software is increasingly used, but the use has no influence on loneliness. However, office workers have an increased interest in digital events through their employer.


**Keywords:** COVID-19, Social Software, Collaboration Tools, Home Office, Working from Home, Virtual Teams, Social Isolation, Loneliness

## 1 Introduction

Due to the global COVID-19 pandemic in 2020, many companies have had their employees work from home to avoid social contact and the associated risk of COVID-19 infection. In addition to the organizational and technical challenges, the duration of working from home and the lower number of social contacts have resulted in a widespread problem: loneliness due to the social isolation of working from home. Social isolation generally occurs when people cannot or are not allowed to maintain contact with family, friends and other people. Loneliness is a possible consequence of those affected by social isolation [Ma19].

In everyday office life among employees, it is now standard practice to hold smaller appointments with locally separated participants using software solutions. These are usually video-based and thus make it possible to have a face-to-face conversation. Furthermore, in a survey of employees on friendships with their colleagues from 2017, almost half of the respondents stated that they also meet their colleagues privately and maintain friendships [St17]. This raises the question of whether a private exchange with colleagues via video-based software tools is increasingly used during social isolation and whether this exchange can reduce potential loneliness.

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The aim of this study is to answer the following research question:

How can video-based social software counteract loneliness due to social isolation during home-based work?

## 2 Virtual Teams and Social Software

Virtual teams are characterized by the fact that the members of these teams are not all present in the same place, but work together in a team through communication and collaboration software [Eb20], [HHR12], [Li20]. The distributed or virtual team does not necessarily have to consist of employees from the same company, as long as all members work towards the same goal [Eb20]. Furthermore do not all members of the team have to be in different locations – thus there are different forms of a virtual team [HHR12].

This form of cooperation inevitably creates new challenges that locally operating teams do not have to deal with. In literature, the opinion prevails that the use of communication media and the way in which these media are used is decisive for the success of virtual teams [HHR12], [Li20]. The tools used must meet the requirements for virtual collaboration and be coordinated with one another in order not to delay processes [Eb20]. The type of use is aimed at the communication with the collaboration software. The challenge here is that the type and perception of communication are different than is the case with a personal exchange [HHR12].

Regarding social software, there is no uniform definition in the literature, as the basic idea of this concept has grown over time and most works refer to different authors. Therefore, a uniform definition of these terms must be established [Al04], [KR09], [SJ08], [TSL16]. Social software are applications that are intended to improve collaboration between groups [Al04], [SJ08]. The definition of Coates is used for the present work:

"Social software can be loosely defined as software which supports, extends, or derives added value from, [sic!] Human social behavior" [Co05].

This implies that any software can also be called social software, provided that it is used for collaboration between people. Examples of social software applications are wikis, weblogs, instant messaging and social networks [SJ08].

## 3 State of Research

There are already many studies on social isolation, especially in the context of the COVID-19 pandemic. The first question that arises is whether the contact restrictions triggered by the pandemic generally affect people's well-being. Ammar et al. have taken on this

question. In a study from 2020 with 1047 participants, mainly from Asia, Africa and Europe, the authors showed that the contact restrictions worsened mental well-being and increased the rate of depressive symptoms [Am20].

Majumdar, Biswas and Sahu have also demonstrated the increase in depressive symptoms. In their study in the form of an online questionnaire from the year 2020, the authors surveyed 203 office workers and 325 students from India and compared the results between the two groups. Regardless of the grouping, Majumdar et al. were also able to demonstrate that domestic isolation in the context of the COVID-19 pandemic increased the rate of depressive symptoms. The authors have also found that office workers have a reduced nighttime rest period and general daytime tiredness has increased [MBS20].

That this social isolation through quarantine measures was already known before COVID-19, Röhr et al. proven in their literature review from 2020. The authors identified 13 relevant studies that dealt with this topic during the SARS pandemic in 2002 - 2003 and the MERS pandemic in 2012. Among them, qualitative and quantitative studies have shown that - in addition to the depressive symptoms and sleep disorders already considered - the participants' feelings of loneliness in particular increased [Rö20].

After the connection between social isolation due to quarantine measures and the resulting loneliness has been proven several times, the question arises as to which countermeasures are available. The World Health Organization (WHO) recommends maintaining contact via phone or digital media during domestic isolation [Wo20].

Sha et al. have examined the problem of loneliness in quarantine and the role of software tools that can solve this problem in their position from 2020. The authors refer to newly created chat tools, which are intended to remedy mental problems through isolation in the form of online therapy. They also recommend using collaboration software such as Microsoft Teams or Zoom to keep in touch with family and friends. In addition, people with little knowledge of digital technology must be supported in setting up and using such software [Sh20]. An evaluation of user data (n=6000) by Microsoft for the Microsoft Teams software shows that many people use these communication tools. This evaluation took place six months after the first quarantine measures in 2020 and showed that communication with the tool has increased significantly [Sp20].

Kozhina achieved a different empirical result in 2016. With an online questionnaire and 240 participants, the author validated her hypothesis as to whether loneliness while working from home can be reduced by providing communication technologies. The survey could not confirm the hypothesis, so loneliness during home-based work cannot be achieved by providing communication software [Ko16]. From the author's point of view, the result must be viewed critically, as the mere availability of a software does not say anything about its use. Rather, it should be investigated whether and how the provided communication technologies can be used against loneliness when working from home.

There does not seem to be any studies to date on this question of how companies or company employees use communication technologies against loneliness in isolation, but there are some expert opinions. In her post on the social network Xing, Dornheim recommends how various virtual formats can be used to promote team spirit and social exchange. This begins with simple rules of communication, e.g. switching on the webcam or a topic-independent opening question, which means that each participant can have a say. The author further recommends providing a group chat that is explicitly not about work. At the end of her article, Dornheim points out the possibility of virtual coffee breaks, which can also be held randomly between individual team members in order to promote private communication [Do20].

## 4 Materials and Methods

Hypotheses will be derived from the research question of this paper and the current state of research, which will be empirically tested in the further course of the paper. The first hypothesis is derived directly from the research question "How can video-based social software counteract loneliness due to social isolation during home-based work?".

**H1:** *The intensive use of social software has a positive effect on the perceived level of loneliness in social isolation.*

Furthermore, the literature review revealed that merely providing social software is not enough to prevent social isolation. Therefore, the assumption is made that offers for social exchange are gladly accepted by people in social isolation.

**H2:** *During social isolation, there is increased interest in digital events among employees.*

In order to test the hypotheses H1 and H2, a suitable empirical research method is needed. Basically, qualitative and quantitative methods are suitable for this. In quantitative research, numerically usable data is collected through questionnaires, measurements or experiments. Qualitative methods deal with data that cannot be evaluated numerically and require interpretation [BSS17]. Examples are interviews, content analyses and observations. From the author's point of view, qualitative methods are not suitable for testing the hypotheses. As was shown in the previous chapter, there is no body of research that can be used to validate the hypotheses. Likewise, the use of interviews, for example, is not expedient, as these are not suitable for interviewing a large number of participants.

The quantitative research method of the questionnaire is selected for the investigation. By creating an online questionnaire, it is possible to reach many participants even in times of COVID-19. Furthermore, a survey and thus the collection of data from many office workers working from home is suitable.

The population of the survey included workers who work permanently or partially from

home due to the COVID-19 pandemic. As this involves many people worldwide, it is not possible to collect data on all affected individuals. Furthermore, there are cultural differences which cannot be considered within the scope of the work. Therefore, the survey is only conducted among German employees working from home, as these can be better reached by the author. The survey is therefore not representative of the population but should be seen as a sample of German employees working from home.

An online questionnaire was chosen for the survey, as this form can reach many people in a short time. Two weeks were chosen as the time period, from 14.12.2020 to 27.12.2020. The questionnaire was created using Google Forms (<https://www.google.com/forms>)<sup>2</sup>. The questionnaire is in German and divided into the following four sections:

In the introduction, the general conditions of the survey are listed. This includes a description of the author, the aim and the time period of the survey as well as a delimitation of which persons constitute the target group of the survey. Since sensitive data may be collected in a survey, a data protection statement must be agreed to in the introduction before the questionnaire can be started.

In the general questions section, the participants of the survey are asked to state their gender, age range, type of office work and how long they have been working from home. Multiple-choice questions with predefined answers were selected for this purpose. Although office workers were named as the target group of the survey in the introduction, there are also selection options in the questions in order to filter out answers that are not relevant to the target group. This is applied to the type of office activity and the duration of working from home.

The section on digital exchange deals with the use of social software while working from home. In order to be able to answer the research question, it is of interest whether the participants of the survey make increased use of digital media while working from home and whether these are also used for private conversations with colleagues. In addition, answering H2 is targeted by two questions.

The last section, social interactions while working from home, serves to verify H1. On the one hand, this section asks about the frequency of social interactions in the professional and private context, and on the other hand about the perceived loneliness caused by working from home. This should reveal whether the frequency of social interactions and the type of communication have an influence on the perceived loneliness.

After the questions are created, they are tested for comprehensibility with two uninvolved persons. In order to send the survey to as many people as possible, the sample selection procedure according to the snowball system is used. Selected persons act as multipliers

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<sup>2</sup> The questionnaire was written in German and can be viewed at the following link:  
[https://www.dropbox.com/s/98uqv5e6wph3p85/Umfrage\\_Covid19\\_Fragen.pdf?dl=0](https://www.dropbox.com/s/98uqv5e6wph3p85/Umfrage_Covid19_Fragen.pdf?dl=0)

and distribute the survey to other suitable groups of people [MS10]. In this survey, the multipliers are mostly friends, relatives and colleagues who have forwarded the survey to colleagues of their employer. Furthermore, the author of this paper shared the sample survey within his employer via the social network Yammer. The survey was also sent to all students at the Wilhelm Büchner University and posted in various Xing groups.

In order to evaluate the collected data, descriptive statistics methods are used in the statistical analysis. The answers in Google Forms are exported to an Excel file, which are then prepared for analysis and imported into the SPSS software. For the multiple choice questions, the absolute answers are considered and presented in a table. The questions on the number of social interactions as a free text response are tested for correlation with perceived loneliness.

## 5 Results

The sample size is 381 people. Since the target group of the sample was people in an office job, the data first had to be adjusted. The responses of the 18 people who did not work in the office were excluded. Furthermore, the results of the 26 people who have an office job but do not work from home were also excluded. Since the target group of the study includes all employees working from home, people who had already worked from home before the COVID-19 pandemic were included in the evaluation. Thus, the number of participants was reduced from the original 381 to 337 people, whereby 88.5% of the answers were usable.

Of these 337 participants, 128 (38%) were female, 208 (61.7%) were male and 1 (0.3%) were diverse. Of the respondents, one was under 20 years of age (0.3%), 114 between 20 and 29 years of age (33.8%), 139 between 30 and 39 (41.2%), 56 (16.6%) between 40 and 49 years, 26 (7.7%) between 50 and 59 years old and one person (0.3%) older than 60 years. Furthermore, 331 (98.2%) of the study participants worked in an office position and 6 (1.8%) were self-employed with an office job. Of the 337 participants, more than half had been working from home for more than 6 months (180 people, 53.4%). 16 respondents (4.7%) were already working from home before the COVID-19 pandemic, 27 people (8%) have been at home for at least 2 months and a maximum of 6 months. 15 of the participants (4.5%) worked from home for less than 2 months. 99 respondents (29.4%) switch between working from home and office on a daily basis.

	<b>Totally agree</b> Number (line percentage)	<b>Rather agree</b> Number (line percentage)	<b>Undecided</b> Number (line percentage)	<b>Rather disagree</b> Number (line percentage)	<b>Totally disagree</b> Number (line percentage)
Q5 When Working from home, I use digital media more than before	204 60.50%	90 26.70%	25 7.40%	12 3.60%	6 1.80%
Q6 I use digital exchange formats and events to stay in contact with my colleagues	78 23.10%	84 24.90%	61 18.10%	67 19.90%	47 13.90%
Q7 I would be interested in a digital event organized by my employer (e.g. virtual pub quiz) and would take part in it.	73 21.70%	117 34.70%	70 20.80%	50 14.80%	27 8.00%
Q9 Due to working from home during the COVID-19 pandemic, I have fewer professional contacts	109 32.30%	97 28.80%	63 18.70%	48 14.20%	20 5.90%
Q10 Working from home makes me feel more lonely than before	36 10.70%	82 24.30%	71 21.10%	90 26.70%	58 17.20%
Q11 Working from home makes me feel more lonely than before, despite the use of digital exchange formats and events	30 8.90%	85 25.20%	63 18.70%	89 26.40%	70 20.80%

Table 1: Multiple Choice questions with the same answer options

Table 1 summarizes all multiple-choice questions with the same answer options. The number of answers per line is 337 or 100%.

	Average	Standard deviation	Median	Percentile 25th	Percentile 75th
Q12 In total, how many social interactions do you have in a week?	63	116	35	20	60
Q13 How many of the social interactions from Q12 take place via video calls?	27	73	12	5	27

Table 2: Statistical indicators for questions 12 and 13

In order to make the connection between the perceived loneliness and the usage behaviour of social software comparable, the comparison of question 11 with questions 12 and 13 shown in Table 2 is suitable. The correlation coefficient for Q11 and Q12 is 0,09 and for Q11 and Q13 it is 0,03. This indicates that there is no correlation between the answers.

## 6 Discussion

The aim of this work was to investigate the possibilities of video-based social software against loneliness due to social isolation while working from home. H1 hypothesized that intensive use of social software would have a positive effect on perceived loneliness. This hypothesis seems unlikely, as the results of the survey do not confirm this. Although it could be shown that with an increasing number of social interactions the perceived loneliness is lower, the intensive use of video telephony has no influence on the perceived loneliness. In the results for H1, it should be noted that the number of weekly video calls was similarly low for both lonely and non-lonely individuals. Fittingly, half of the respondents indicated that they only occasionally use digital media for private exchanges with colleagues. That normal phone calls do not reduce loneliness within social isolation is shown by a 2015 study at a Chinese travel company call center where volunteers worked from home for 9 months. Despite working in a job with many social interactions per day, the majority of study participants wanted to return to office work to escape the loneliness



while working from home [B115]. Therefore, it is concluded that when the sense of loneliness is low and the number of social interactions is high, many of them take place in person among friends and family. Kozhina also found in her study that the use of better communication technology does not reduce loneliness [Ko16].

Therefore, H2 was used to investigate a specific use of video-based social software. H2 assumed that during social isolation, there would be an increased interest in digital events. The results of the survey indicate that H2 is likely. More than half of all participants had agreed to be interested in a digital event hosted by their employer. This is more than the number of people who already use digital exchange formats with their colleagues, confirming an increased interest. However, more than two-thirds of respondents only occasionally or never use social software to discuss private topics with their colleagues. The reason for this remains open, presumably an overload due to the task/workload or a lack of acceptance by the manager for private conversations is responsible for this. This implies that private exchanges among colleagues should be encouraged more by the employer. It is conceivable that managers could be made aware of the problem of loneliness while working from home and that formats such as a virtual coffee exchange or a virtual pub quiz could be organized/provided.

A limitation of this study is that the number of participants with usable answers is exceptionally low (n=337) compared to the population. Furthermore, three quarters of the participants are between 20 and 40 years old. There are not enough responses from older employees to be able to make age-related statements. Just these are however remarkably interesting for the evaluation, since particularly older humans rank among the risk group for loneliness in the social isolation. A further limitation results from the investigation of H1, since the marital status and/or the housing situation of the participants was not inquired. Although it is not the goal of this study to prove an increased loneliness among single persons, these data are interesting in combination with the use of video telephony.

Therefore, further studies can evaluate whether individuals without additional members in their home environment (e.g., single people, students, ...) have increased social interactions via video-based social software. Likewise, further studies can explore why the opportunities for video-based exchange and events of this kind are not more widely used. Of interest here is whether this is due to the mere organization of such formats or whether employees must work extra hours from home and therefore do not have time to participate.

## 7 Conclusions

The analysis of the current state of research shows that employees in social isolation perceive an increased feeling of loneliness. This loneliness, in turn, can be responsible for secondary mental illnesses such as depression. A basic finding is that this study could not

prove a positive effect of the allocation of social software on loneliness in social isolation. There are no studies at this time on how video-based social software would need to be used for this purpose.

The quantitative research hints that video-based social software is increasingly used while working from home, but the use does not change loneliness. Furthermore, the software solutions are only occasionally used for a private exchange with colleagues, although there is an interest in digital events among the majority of respondents.

Referring to the research question, the study indicates that the mere provision of video-based social software cannot reduce loneliness. Employees must rather actively use this software for private social exchange. This can take place, for example, through independent organization by colleagues or the employer's commitment by making managers aware of the issue and promoting exchange between employees through digital events.

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