

Why am I so exhausted?:

Exploring Meeting-to-Work Transition and Recovery from Virtual Meeting Fatigue

Joseph A. Allen

University of Utah

Matthew S. Thiese

University of Utah

Emilee Eden

University of Utah

Sarah E. Knowles

Brigham Young University

(under review at *Consulting Psychology*)

Abstract

Although meetings are central to organizations today, ineffective meetings have been well-documented as presenting considerable direct (e.g., salary) and indirect cost (e.g., time lost). This study explores the idea that people need meeting recovery, or time to transition from their workplace meeting to their next task, which is often another meeting. Meeting recovery may explain the commonly experienced feel of virtual meeting fatigue. Using a quantitative survey of working adults' last meeting, we found that meeting outcomes (satisfaction and effectiveness) are particularly related to meeting recovery and that relationship is moderated by the degree to which the meeting was relevant to the individual. Implications for theory and practice are discussed in order to provide concrete recommendations for researchers, managers, and consultants.

Keywords: workplace meetings, virtual meeting fatigue, meeting recovery, team meetings

Why am I so exhausted?:

Exploring Meeting-to-Work Transition Time and Recovery from Virtual Meeting

Fatigue

Meetings have become an increasingly central to organizations as they serve as a key tool for employees to exchange information, monitor progress, and strengthen social relationships (Cohen, Rogelberg, Allen, & Luong, 2011; Rogelberg, Leach, Warr, & Burnfield, 2006). However, in prior research, employees have characterized meetings as disruptive (Rogelberg et al., 2006), dreadful (Allen et al., 2012), and a waste of time (Rogelberg, Shanock, & Scott, 2012). Ineffective meetings that provoke such a reaction have been associated with direct and indirect costs to the organization, with one survey estimating that unproductive meetings cost British companies £27.5 billion per year (Payton, 2009). The primary source of those costs are related to time spent in ineffective ways, with one report suggesting that 47% of employees identify meetings as the number one time waster at work (Pozin, 2013). This misspent time results in direct monetary costs in the form of salary and benefits derived from employee time in preparing for, attending, leading, and processing meeting results (Rogelberg et al., 2012; Van Vree, 1999). There are also significant indirect costs associated with stress and fatigue (Luong & Rogelberg, 2005), decreased job satisfaction (Rogelberg, Allen, Shanock, Scott, & Shuffler, 2010), and opportunity costs, or the time lost that may have been better spent on other work activities (Rogelberg et al., 2012).

Although normative to discuss how awful our meetings may be, meetings serve many important functions that are essential to work (Rogelberg et al., 2006). Good meetings result in important decision-making, collaboration that is essential to achieve organizational aims, socializing which builds team cohesion and productivity, and some meetings even have the potential to engage the workforce (Allen & Rogelberg, 2013). For example, relevant meetings—those meetings that are of particular interest to the participants—typically include decisions and outcomes that have a meaningful impact on the participating employees. These

relevant meetings also have the potential to promote employee engagement, as they have enabled progress on a project, task, or other work feature (Allen & Rogelberg, 2013).

Recently, however, we have seen a sudden growth in concerns related to a new type of meeting fatigue, that of virtual meeting fatigue (Jiang, 2020). Described as a new layer of exhaustion after a long day talking to a box on one's desktop, virtual meeting fatigue appears to exist even when the meetings being attended are considered necessary and perhaps even effective and satisfying. However, this new layer of fatigue stemming from meetings may require additional attention in terms of recovery as people transition from one virtual meeting to the next, or perhaps to other work.

The purpose of the current study was to explore the transition from both good and bad virtual meetings to work, with a particular interest in meeting recovery, or the time spent by an individual after group and team meetings recovering and transitioning to the next task/meeting. Building upon previous work by meeting scientists showing that meetings can have positive and negative effects on employee's job attitudes and well-being (Rogelberg et al., 2006), we further explore how the relevance of a given meeting can impact the relationship between meeting outcomes and meeting recovery, perhaps nullifying the fatigue and transition time needs.

Meeting Science and the Virtual Meeting

Early in the development of meeting science, Schwartzman (1989, p. 7) defined meetings as focused communicative gatherings of two or more individuals for the purpose of work or group-related interaction. Workplace meetings tend to have more structure than simple chats but less than a lecture, last an average of 30 to 60 minutes, and may be conducted in various modalities (e.g., conference calls; (Rogelberg et al., 2006)). Meetings vary in regards to purpose, interactions, and design characteristics (Allen, Beck, Scott, & Rogelberg, 2014; Cohen et al., 2011; Kauffeld & Lehmann-Willenbrock, 2012). Interactions and communication within meetings have implications for job satisfaction, well-being,

strategic outcomes, and employee engagement outside of the meeting context (Allen & Rogelberg, 2013; Jarzabkowski & Seidl, 2008; Rogelberg et al., 2010; Rogelberg et al., 2006).

Most of the previous work in the area of meeting science focused on face-to-face meetings or did not differentiate between modalities at all, with a few noted exceptions (e.g. (Allison, Shuffler, & Wallace, 2015). The general lack of focus on meeting modality was not problematic before March 2020, as nearly 80% of all meetings were face-to-face in nature (Reed & Allen, 2021). However, in March 2020, the COVID-19 pandemic hit, forcing many employees to suddenly have to work from remote locations, use virtual meeting tools, and generally operate differently. Face-to-face meeting modality prevalence dropped to around 10% of all meetings, while virtual meetings soared to over 60% of all meetings (Reed & Allen, 2021). An unintended consequence of the transition in modality was the sudden onset of increased meeting-related fatigue, lovingly referred to as “Zoom fatigue” and “Webex weariness” in the popular press (Lee, 2020; Liz Fosslien, 2020).

In this research, we focus on the reactions to virtual meetings and how these reactions related to the need for both transition time and recovery due to the onset of virtual meeting fatigue. Specifically, we investigate the possibility that when people attend virtual meetings, they turn off their camera feeling some level of drain, and perhaps struggle to return to productive activities in an efficient manner.

Meeting Recovery

Similar to other research on the notion of recovery from work (Demerouti, Bakker, Geurts, & Taris, 2009; Totterdell, Spelten, Smith, Barton, & Folkard, 1995; Zijlstra & Sonnentag, 2006) we define meeting recovery as the time spent by an individual after group and team meetings recovering and transitioning to the next task/meeting. Meeting recovery is inherently value-neutral, as it is needed after both good and bad meetings. Research in neuroscience and cognitive psychology suggest humans need a varying amount of time for

both task switching (Ravizza & Carter, 2008) and cognitive shifting (Pan & Yu, 2018). Task switching is the unconscious ability of humans to switch attention from one task to the next, whereas cognitive shifting is the active conscious effort to mentally switch attention from one thing to another (Monchi et al., 2004). Both of these processes take time, and they must occur after a virtual meeting, no matter how good or bad it was.

Meeting recovery is the time needed to make these switches, as well as other effortful tasks focused on preparation and engagement. Back-to-back meetings may be frequent on one's calendar but rarely do they include those few minutes needed to get ready for the next meeting or the next relevant task. Although there is a growing body of research on meetings and their outcomes (see Mroz, Allen, Verhoeven, and Shuffler (2018) for a summary), little research has focused on how attendees overcome the interruptions and disruptive nature of workplace meetings (Rogelberg et al., 2006). Thus, we explore the meeting recovery as the mechanism by which meeting attendees transition from one task to another and overcome the disruptive nature of workplace meetings in general.

Meeting Outcomes, Meeting Recovery, and Transition Time

Given the neurological and cognitive underpinnings of meeting recovery and transition time, we expect that regardless of the outcomes of the virtual meeting, some level of meeting recovery and transition time will be needed. Meeting outcomes, for our purposes, refer to meeting satisfaction and effectiveness (Allen, Lehmann-Willenbrock, & Rogelberg, 2018). Meeting satisfaction refers to meeting participants feeling that the meeting went well overall (Allen, Lehmann-Willenbrock, & Sands, 2016). Previous research has showed that meeting satisfaction is a meaningful component of job satisfaction and has implications for how people perform at work (Rogelberg et al., 2010). Meeting effectiveness refers to the degree to which meeting participants believe the meeting accomplished the goals for which it was called, as well as the feeling that the meeting ran efficiently (Leach, Rogelberg, Warr, & Burnfield, 2009). Research on meeting effectiveness shows that it can have a lasting impact

on how engaged and empowered employees feel, both factors which are direct precursors to their overall effort at work (Allen et al., 2016). The positive effects of meeting outcomes on job attitudes and well-being are supported by both data and theory (e.g., conservation of resources theory) (Allen et al., 2012), and we anticipate the effect of both meeting satisfaction and effectiveness will behave similarly in relation to meeting recovery and transition time. We expect that these meeting outcomes will negatively relate to both feelings of meeting recovery and transition time. The following hypotheses are proposed:

Hypothesis 1: Meeting satisfaction is negatively related to both (a) meeting-to-work transition time and (b) meeting recovery.

Hypothesis 2: Meeting effectiveness is negatively related to both (a) meeting-to-work transition time and (b) meeting recovery.

Meeting Relevance as a Moderator

Although we expect a direct relationship between meeting outcomes and meeting recovery, that relationship may be impacted by a particular meeting attribute: meeting relevance. Meeting relevance refers to the degree to which the meeting is perceived as pertinent to the employees invited to attend and participate in the meeting (Allen & Rogelberg, 2013). Meetings perceived as relevant demonstrate respect and support for employee's efforts on the job, as the meeting likely serves to enable their goal accomplishment by providing inputs to their work.

In terms of virtual meeting recovery and transition time, we expect that meeting relevance may moderate the meeting outcomes to meeting recovery and transition time relationships. Specifically, meeting relevance may strengthen the magnitude of the negative relationship between meeting satisfaction/effectiveness and meeting recovery/transition time. The following hypotheses are proposed:

Hypothesis 3a: The negative relationship between meeting satisfaction and meeting recovery is moderated by meeting relevance, such that the negative relationship is stronger when the meeting is more relevant.

Hypothesis 3b: The negative relationship between meeting effectiveness and meeting recovery is moderated by meeting relevance, such that the negative relationship is stronger when the meeting is more relevant.

Hypothesis 4a: The negative relationship between meeting satisfaction and meeting-to-work transition time is moderated by meeting relevance, such that the negative relationship is stronger when the meeting is more relevant.

Hypothesis 4b: The negative relationship between meeting effectiveness and meeting-to-work transition time is moderated by meeting relevance, such that the negative relationship is stronger when the meeting is more relevant.

Methods

Participants and Procedure

Upon receiving IRB approval from the appropriate institution, participants were recruited via Amazon's Mechanical Turk (MTurk) from April 15, 2020 to April 30, 2020, a platform designed to enable individuals to complete electronic surveys for compensation. Participants for this study were required to be 18 years of age and full-time employees within the United States, as well as attending at least one work meeting each week. A total of 495 participants responded to the survey and were compensated (\$0.75 each). Participants whose last meeting was not virtual, who did not attend work-related meetings, or were not full-time employees were excluded ($n = 300$). The final sample was 195 participants. In the sample ($N=195$), 37.44% were female. The mean age of participants was 37.44 years old ($SD = 10.26$). The average tenure in their current job was 6.55 years ($SD = 6.50$) and the average

tenure in their current organization was 7.48 years ($SD = 6.72$). The average number of meetings per week was 3.64 ($SD = 3.57$) and the average number of hours in meetings per week was 4.42 hours ($SD = 5.92$).

Measures

Meeting Effectiveness. A six-item scale that has been used in previous research was used to evaluate meeting effectiveness (Rogelberg et al., 2010). Participants were asked to think about their last workplace meeting and indicate how effective the meeting was relative to each presented statement. Statements provided included: “achieving your own work goals,” “achieving colleagues’ work goals,” “achieving your department-section-unit’s goals,” “providing you with an opportunity to acquire useful information,” “providing you with an opportunity to meet, socialize, or network with people,” and “promoting commitment to what was said and done in the meeting.” Each item was rated using a five-point scale from 1, or extremely ineffective, to 5, or extremely effective.

Meeting Satisfaction. A six-item scale was used to evaluate meeting satisfaction (Cohen et al., 2011). Participants were asked to think about their last workplace meeting and indicate how each presented word described that meeting. The six words included were as follows: stimulating, boring, unpleasant, satisfying, enjoyable and annoying. Each item was rated using a seven-point scale from 1, or strongly disagree, to 7, or strongly agree.

Meeting Recovery. We created a new measure of meeting recovery since this is the first empirical study focusing on this phenomenon. The question read, “Please indicate your level of agreement with the following statements concerning your last meeting...,” followed by several items. The initial item pool consisted of 16 items. Upon data collection, we conducted an exploratory factor analysis using the final usable sample. This methodological approach is appropriate and accepted as best practice (Tabachnick, Fidell, & Ullman, 2007) since there are no other data testing the factor structure of meeting recovery. Exploratory

factor analysis (EFA) is necessary to create a calculation method that represents an important underlying latent dimension(s) or construct(s) expressed in observed variables (Fabrigar & Wegener, 2011; Hair, Black, Babin, & Anderson, 2010). Researchers want to define classes of variables in this sense, each of which has clear associations with only one factor, and to understand and mark each factor (Warner, 2008). We also carried out an EFA to establish a scale that tests the attitudes of participants towards meetings. Our decision logic was to determine if the finished scale was unidimensional or multidimensional, and, if multidimensional, how many variables (dimensions) were used in the instrument and what elements were grouped as a factor together. Factors were extracted and rotated using varimax rotation and the initial analysis resulted in a two-factor solution (see Table 1). Upon inspection, all the items falling into the second factor were negatively worded (DiStefano & Motl, 2006), the valence was unclear, or the item may not apply equally across individuals given the focus on virtual meetings. These items were removed as no *a priori* theory supported a multi-factor solution. The only explanation for the second factor was the common negative wording used or potential misinterpretation causing construct confusion or error. The final measure included twelve items (see Appendix A). Each item was rated using a seven-point scale from 1, or strongly disagree, to 7, or strongly agree.

Time to Work. Participants were asked to indicate how many minutes it took them to transition back to work-related tasks after their last meeting.

Meeting Relevance. A seven-item scale was used to evaluate meeting relevance that was adapted from a goal and process clarity scale (Sawyer, 1992). Participants were asked to think about their last workplace meeting and evaluate if it was relevant to their work goals. Samples items included “The meeting was relevant to my job” and “The meeting helped me accomplish my duties and responsibilities.” Each item was rated using a seven-point scale from 1, or strongly disagree, to 7, or strongly agree.

Demographic Variables. Several demographic questions were included on the survey, including the participant's gender identity, age, tenure at the organization and in the occupation, hours worked per week, number of meetings per week, and number of hours spent in meetings. These were used to screen out individuals who did not fit study sampling criteria (e.g., no meetings) and as potential control variables in the subsequent modeling.

Statistical Analysis. Descriptive statistics included mean and standard deviation for continuous variables or number and percentage for categorical variables. Assessment for normality was performed. Correlations and alpha reliability were calculated adjusted for gender and tenure in the current organization. All analyses were performed using SAS 9.4 (SAS Institute, Cary, NC, USA).

Results

Table 2 contains the means, standard deviations, correlations, and alpha reliability estimates for all the focal variables. Two specific demographic variables, gender and tenure in the current organization, were controlled for in analyses. Each of these variables has a correlation with the predictor and outcome variables.

Correlation analyses indicate no relationship between most meeting outcomes and meeting-to-work transition time. However, there is a statistically significant relationship between meeting recovery and transition time ($r = 0.38, p < 0.05$). Other relationships are in the direction anticipated.

In looking at the specific correlations between meeting satisfaction, effectiveness, and recovery, we note that they are relatively high ($r = 0.66$ to 0.73), suggesting some redundancy in the measurement. To mitigate this concern, a confirmatory factor analysis was performed to test whether a one-factor solution (CFI = 0.65, TLI = 0.58, $\chi^2 = 863.89$, $df = 152$, RMSEA = 0.14) versus a three-factor solution (CFI = 0.80, TLI = 0.75, $\chi^2 = 508.34$, $df = 149$, RMSEA = 0.09) would be a better fit for the measurement model. Using the chi-square difference test,

results indicate the three-factor model fits better than the one-factor model ($\Delta\chi^2 = 355.55$, $\Delta df = 3$, $p < 0.05$), and the general fit of the three-factor model suggests discriminant validity evidence for the three interrelating constructs. Given these results, we felt comfortable to tentatively proceed with hypothesis testing.

Hypothesis 1 stated that meeting satisfaction would negatively relate to both meeting-to-work transition time and meeting recovery. Correlations, found in Table 1, indicate a statistically significant and meaningful negative correlation between meeting satisfaction and meeting recovery ($r = -0.38$, $p < 0.05$), but not between meeting satisfaction and transition time ($r = -0.08$, $p > 0.05$). These results lend partial support to the first hypothesis.

Hypothesis 2 stated that meeting effectiveness would negatively relate to both meeting-to-work transition time and meeting recovery. Correlations, found in Table 1, indicate a statistically significant and meaningful negative correlation between meeting effectiveness and meeting recovery ($r = -0.22$, $p < 0.05$), but not between meeting effectiveness and transition time ($r = -0.05$, $p > 0.05$). These results lend partial support to the first hypothesis.

Hypothesis 3a stated that meeting relevance would moderate the negative relationship between meeting satisfaction and meeting recovery in that the negative relationship would be stronger when the meeting was deemed more relevant. To test this hypothesis, we performed regression analysis to confirm the direct negative relationship ($\beta = -0.41$, $p < 0.05$) and then entered the interaction between meeting satisfaction and meeting relevance in the next step (see Table 3). Results indicated a statistically significant interaction effect ($\beta = -0.17$, $p < 0.05$), with the interaction explaining an additional 7% of the variance in meeting recovery. The interaction was graphed (see Figure 1) and the pattern of the relationship is consistent with the hypothesis. These findings lend support to Hypothesis 3a.

Hypothesis 3b stated that meeting relevance would moderate the negative relationship between meeting effectiveness and meeting recovery in that the negative relationship would

be stronger when the meeting was deemed more relevant. To test this hypothesis, we performed regression analysis to confirm the direct negative relationship ($\beta = -0.39, p < 0.05$) and then entered the interaction between meeting satisfaction and meeting relevance in the next step (see Table 3). Results indicated a statistically significant interaction effect ($\beta = -0.22, p < 0.05$), with the interaction explaining an additional 4% of the variance in meeting recovery. The interaction was graphed (see Figure 2) and the pattern of the relationship was different than expected. Specifically, at lower levels of meeting relevance, the relationship between meeting effectiveness and meeting recovery, the slope of the line becomes positive. This suggests that at low levels of meeting relevance, increasing meeting effectiveness accompanies increasing meeting recovery. At high levels of meeting relevance, the positive and negative relationships essentially go away (i.e., the slope of the line approaches flat). Generally speaking these findings lend some support to Hypothesis 3b, though with noted differences.

Hypotheses 4a and 4b were not further probed due to the lack of statistically significant and meaningful relationships between meeting outcomes and transition time.

Discussion

The purpose of this study was to investigate the negative relationship between virtual meeting outcomes (i.e. meeting satisfaction and effectiveness) and both meeting recovery and meeting-to-work transition time. The results indicate support for the inverse relationship between both predictors of meeting satisfaction and effectiveness with the outcome of meeting recovery. This means that as meetings get better—from either or both an overall outcome perspective of perceived satisfaction and effectiveness—individuals express less of a need to recover after the meeting. Therefore, the inverse is true; if individuals have a poor perception of either satisfaction or effectiveness, longer recovery time is needed. Given the number of meetings people experience in general (Keith, 2015) and the propensity for them to be scheduled back-to-back (Reed & Allen, 2021), it appears to be more important to ensure

that our meetings are of higher overall quality so as to mitigate the need for recovery, or conversely schedule longer recovery between meetings if quality cannot be improved.

Much to our surprise meeting outcomes did not relate to meeting-to-work transition time. It was hypothesized and generally supported by theory that as meetings got better, the need for time to transition from the meeting to other activities (including other meetings) would be reduced. However, the inverse relationship was not statistically significant, nor was there practically a sufficiently strong correlation to indicate issues with ability to detect the effect. One reason for the lack of findings here may be a function of the measurement approach. Participants were asked how long it took them to transition after their last meeting to their work. However, their schedule may not be within their control and for some, if the next thing was another meeting (i.e. back-to-back), the transition time is pre-defined and not of a function of the time needed. How much time they had and how much time they needed are two different, and in this case, conflated measures.

We found support for meeting relevance moderating the negative relationships between meeting satisfaction and effectiveness with meeting recovery from the moderation analyses. The nature of the moderation was consistent with the hypotheses for meeting satisfaction and recovery. More relevant meetings showed a stronger inverse relationship with recovery time than less relevant meetings. For relevant meetings, employees appear to benefit more greatly in terms of recovery when the outcomes are more satisfying and effective.

In contrast, our findings on the moderation effect of meeting relevance on the meeting effectiveness to meeting recovery relationship were different than what was hypothesized. Rather than strengthening the inverse relationship, meeting relevance appeared to flip the relationship. When meetings are particularly relevant, the relationship between meeting effectiveness and recovery is positive. Put another way, if the meeting is perceived as being relevant, then as the effectiveness of the meeting increases, so does the time needed for recovery from that meeting. One possibility for this finding is that relevant meetings typically

have a greater impact on the work of those in the meeting (Allen & Rogelberg, 2013). The implications of those meetings may create a desire to ruminate, consider the results, and process the meaning of the meeting outcomes. When a meeting is both particularly effective and relevant, perhaps recovery also refers to simply processing time of the implications. Additionally, meetings that are both relevant and effective may also have many after-action elements for the attendees, such as compiling and prioritizing action items from the meeting, scheduling follow-up meetings with key stakeholders, or dissemination of information and delegation of responsibilities to others. These activities can be mentally fatiguing and are compounded by immediately following an engaging and effective meeting.

Implications for research

These data suggest that there are intricate and complex relationships between meeting effectiveness, perceived relevancy, and the recovery time needed for each individual. The inverse relationships demonstrated in these data suggest that there is a meaningful relationship between these three factors. Additional research into the magnitude of these relationships will yield possibilities for high-impact interventional studies to improve meeting effectiveness and relevancy and reduce recovery time. These may also translate to additional benefits including an increased perception of social support and overall job satisfaction.

Specific activities that are undertaken in the meeting recovery period can be explored to gain additional insight into the coping practices of individuals and how these may relate to longer or shorter recovery times. There may be differences in recovery thoughts, emotions, and activities that differ between different levels of meeting effectiveness or relevancy, all of which manifest in the same need for additional recovery time.

The unanticipated interaction between effective meetings and perceived relevance on the longer recovery time can also be a potentially fruitful area of further research. Additional research regarding the specific overlap of both effectiveness and relevance can help identify

those meetings that are typically perceived as overly positive but require additional recovery time.

Lastly, these relationships were assessed assuming a constant linear relationship between perceived effectiveness and relevance and the outcome of meeting recovery. There may be a curvilinear relationship between these meeting metrics where extremely engaging or hyper-efficient meetings may require much more recovery time than a moderately engaging meeting. Similarly, if meetings have no relevancy, meeting recovery is possibly very low, suggesting that there may be a “sweet spot” of relevance and effectiveness for productive meeting and the subsequent need of meeting recovery.

Implications for practice

Scheduling recovery time between meetings can help improve productivity and reduce burnout. Most individuals have an idea about the relevance of a meeting before going into it. These results can help individuals to appropriately schedule recovery time between meetings, with approximate lengths based on the level of relevance. If a meeting is suspected to be less engaging or less relevant, then individuals can schedule additional recovery time between meetings prior to returning to work activities.

Similarly, organizers and managers who are mindful of these relationships can appropriately set expectations or schedule meetings to allow for appropriate recovery time. They can also tailor their meetings to try to achieve a desirable amount of relevance and efficacy for their meeting participants and therefore achieve a balance between the efficiency and productivity of their teams. This can be particularly important for daily or weekly meetings that have a high level of importance and occur at the very beginning of the day, such as safety or production meetings.

Limitations and Strengths

There are a few potential limitations to this study. This is a cross-sectional study and therefore unable to demonstrate temporality and suggest a possible causal relationship

between meeting effectiveness, relevancy, and recovery time. This study relied upon a convenience sample from a large, diverse sample and these results may be stronger in specific populations. Similarly, participants were asked about their most recent workplace meeting, resulting in a heterogeneous type of meeting type, purpose, and duration. While these results may be more generalizable, there may be specific types of meetings in which these relationships are either stronger or weaker.

There are many strengths of this study. This study had a relatively large sample size from a diverse array of work types, suggesting that these data may be generalizable to a wide population of workers. This study also utilized many different metrics to quantify job satisfaction, meeting effectiveness, and meeting relevance. Moreover, this is the first study to investigate and quantify meeting recovery in a scientific approach. The use of factor analysis to refine the metric for assessing meeting recovery was also novel.

Conclusion

The findings from this study confirm the popular belief that virtual meetings may create fatigue that requires recovery. Our hope is that the results will be of interest to consulting psychologists and those they serve by legitimizing the feelings they may have experienced with their many meetings and provide justification for humanizing the meeting experience. Building in a bit of recovery time may be an important new practical process to deploy, something that will hopefully be confirmed by future research.

References

- Allen, J. A., Beck, T., Scott, C. W., & Rogelberg, S. G. (2014). Understanding workplace meetings. *Management Research Review*.
- Allen, J. A., Lehmann-Willenbrock, N., & Sands, S. J. (2016). Meetings as a positive boost? How and when meeting satisfaction impacts employee empowerment. *Journal of Business Research*, 69(10), 4340-4347.
- Allen, J. A., Lehmann-Willenbrock, N., & Rogelberg, S. G. (2018). Let's get this meeting started: Meeting lateness and actual meeting outcomes. *Journal of Organizational Behavior*, 39(8), 1008-1021.

- Allen, J. A., & Rogelberg, S. G. (2013). Manager-led group meetings: A context for promoting employee engagement. *Group & Organization Management*, 38(5), 543-569.
- Allen, J. A., Sands, S. J., Mueller, S. L., Frear, K. A., Mudd, M., & Rogelberg, S. G. (2012). Employees' feelings about more meetings. *Management Research Review*.
- Allison, B. B., Shuffler, M. L., & Wallace, A. M. (2015). The successful facilitation of virtual team meetings.
- Cohen, M. A., Rogelberg, S. G., Allen, J. A., & Luong, A. (2011). Meeting design characteristics and attendee perceptions of staff/team meeting quality. *Group Dynamics: Theory, Research, and Practice*, 15(1), 90.
- Demerouti, E., Bakker, A. B., Geurts, S. A., & Taris, T. W. (2009). Daily recovery from work-related effort during non-work time. In *Current perspectives on job-stress recovery*: Emerald Group Publishing Limited.
- DiStefano, C., & Motl, R. W. (2006). Further investigating method effects associated with negatively worded items on self-report surveys. *Structural Equation Modeling*, 13(3), 440-464.
- Fabrigar, L. R., & Wegener, D. T. (2011). *Exploratory factor analysis*: Oxford University Press.
- Hair, J., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate Data Analysis Seventh Edition* Prentice Hall, 2010. *Upper Saddle River, New Jersey*. [Google Scholar].
- Jarzabkowski, P., & Seidl, D. (2008). The role of meetings in the social practice of strategy. *Organization studies*, 29(11), 1391-1426.
- Jiang, M. (2020). The reason Zoom calls drain your energy. Retrieved from <https://www.bbc.com/worklife/article/20200421-why-zoom-video-chats-are-so-exhausting>
- Kauffeld, S., & Lehmann-Willenbrock, N. (2012). Meetings matter: Effects of team meetings on team and organizational success. *Small Group Research*, 43(2), 130-158.
- Keith, E. (2015). 55 Million: A Fresh Look at the Number, Effectiveness, and Cost of Meetings in the U.S. Retrieved from <https://blog.lucidmeetings.com/blog/fresh-look-number-effectiveness-cost-meetings-in-us>
- Leach, D. J., Rogelberg, S. G., Warr, P. B., & Burnfield, J. L. (2009). Perceived meeting effectiveness: The role of design characteristics. *Journal of Business and Psychology*, 24(1), 65-76.
- Lee, J. (2020). A Neuropsychological Exploration of Zoom Fatigue. Retrieved from <https://www.psychiatrytimes.com/view/psychological-exploration-zoom-fatigue>
- Liz Fosslien, M. W. D. (2020). How to Combat Zoom Fatigue. Retrieved from <https://hbr.org/2020/04/how-to-combat-zoom-fatigue>
- Luong, A., & Rogelberg, S. G. (2005). Meetings and more meetings: The relationship between meeting load and the daily well-being of employees. *Group Dynamics: Theory, Research, and Practice*, 9(1), 58.
- Monchi, O., Petrides, M., Doyon, J., Postuma, R. B., Worsley, K., & Dagher, A. (2004). Neural bases of set-shifting deficits in Parkinson's disease. *Journal of Neuroscience*, 24(3), 702-710.

- Mroz, J. E., Allen, J. A., Verhoeven, D. C., & Shuffler, M. L. (2018). Do we really need another meeting? The science of workplace meetings. *Current Directions in Psychological Science*, 27(6), 484-491.
- Pan, X., & Yu, H. (2018). Different effects of cognitive shifting and intelligence on creativity. *The Journal of Creative Behavior*, 52(3), 212-225.
- Payton, S. (2009). The Pow-Wow Factor. 28-32. Retrieved from <https://www.thefreelibrary.com/The+pow-wow+factor%3A+an+unwritten+rule+of+corporate+life+is+that+the...-a0195324306>
- Pozin, I. (2013). The No. 1 Way to Kill Productivity. Retrieved from <https://www.inc.com/ilya-pozin/the-no-1-way-to-kill-productivity.html>
- Ravizza, S. M., & Carter, C. S. (2008). Shifting set about task switching: Behavioral and neural evidence for distinct forms of cognitive flexibility. *Neuropsychologia*, 46(12), 2924-2935.
- Reed, K. M., & Allen, J. A. (2021). *Suddenly Virtual: Making Remote Meetings Work*. Hoboken, NJ: Wiley.
- Rogelberg, S. G., Allen, J. A., Shanock, L., Scott, C., & Shuffler, M. (2010). Employee satisfaction with meetings: A contemporary facet of job satisfaction. *Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of Human Resources Management*, 49(2), 149-172.
- Rogelberg, S. G., Leach, D. J., Warr, P. B., & Burnfield, J. L. (2006). "Not another meeting!" Are meeting time demands related to employee well-being? *Journal of applied psychology*, 91(1), 83.
- Rogelberg, S. G., Shanock, L. R., & Scott, C. W. (2012). Wasted Time and Money in Meetings: Increasing Return on Investment. *Small Group Research*, 43(2), 236-245. doi:10.1177/1046496411429170
- Sawyer, J. E. (1992). Goal and process clarity: Specification of multiple constructs of role ambiguity and a structural equation model of their antecedents and consequences. *Journal of applied psychology*, 77(2), 130.
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5): Pearson Boston, MA.
- Totterdell, P., Spelten, E., Smith, L., Barton, J., & Folkard, S. (1995). Recovery from work shifts: how long does it take? *Journal of applied psychology*, 80(1), 43.
- Van Vree, W. (1999). *Meetings, manners, and civilization: the development of modern meeting behaviour*: Leicester University.
- Warner, R. M. (2008). *Applied statistics: From bivariate through multivariate techniques*: sage.
- Zijlstra, F. R., & Sonnentag, S. (2006). After work is done: Psychological perspectives on recovery from work. *European journal of work and organizational psychology*, 15(2), 129-138.

DRAFT

Table 1

Exploratory Factor Analysis of Meeting Recovery Measure

Item	Factor 1	Factor 2
1. I needed time to recover after my last meeting before moving on to other work-related tasks.	0.74345	0.32276
2. My last meeting created problems I had to resolve before I could get back to my work tasks.	0.69591	0.41077
3. After my last meeting I had an increased desire to share/brainstorm/connect with others. *	0.09935	0.79857
4. I spent time mulling over my last meeting experience.	0.43672	0.66211
5. My last meeting set the tone for the rest of that day. *	0.31583	0.66142
6. My last meeting affected me even after I went home that day. *	0.58882	0.47158
7. After my last meeting it was hard to be fully engaged in other work tasks.	0.83030	0.22995
8. My work performance was inhibited after my last meeting.	0.82380	0.24405
9. I was motivated to do action items from the meeting right away. *	-0.12209	0.80792
10. I wanted to go home early after my last work meeting.	0.82414	0.15025
11. After my last meeting I had a decreased desire to attend meetings in the future.	0.78484	0.01367
12. I was frustrated after my last meeting.	0.84251	0.05791
13. It took me a long time to recover after my last meeting.	0.86430	0.17382
14. I distracted myself from work for some time after my last meeting.	0.83488	0.13930
15. It was tough to transition back to meaningful work tasks after my last meeting.	0.89174	0.16649
16. It took some effort to get back to work after my last meeting.	0.88113	0.17510

Note: * indicates removed from final item list (see Appendix A)

Table 2:

Means, Standard Deviations, Intercorrelations, and Alpha Reliability Estimates for Study Variables.

Measure	M	SD	1	2	3	4	5	6	7	8
1. Meeting Satisfaction	4.80	1.33	(.85)							
2. Meeting Effectiveness	3.63	0.79	.72**	(.88)						
3. Meeting Relevance	4.92	1.46	.66**	0.73**	(.93)					
4. Meeting Recovery	2.84	1.50	-.38**	-.22**	-.24**	(.95)				
5. Transition Time	20.22	23.30	-.08	-.05	-.07	.38**	—			
6. Tenure (pos.)	6.55	6.50	.10	.10	-.06	.19**	.10	—		
7. Tenure (org.)	7.48	6.72	.07	.04	.07	-.11	-.08	.51**	—	
8. Age	37.44	10.26	.00	-.01	-.04	-.05	-.06	.41**	.55**	—
9. Gender	—	—	-.01	.05	.05	-.11*	-.03	.02	.07	.20**
10. Meetings per week	3.64	3.57	-.05	-.14	-.06	.05	-.03	-.01	.10	-.01
11. Hours in meetings per week	4.42	5.92	-.05	-.04	-.03	-.01	.02	.02	.09	.03

Note. * $p < .05$. ** $p < .01$.

Table 3:

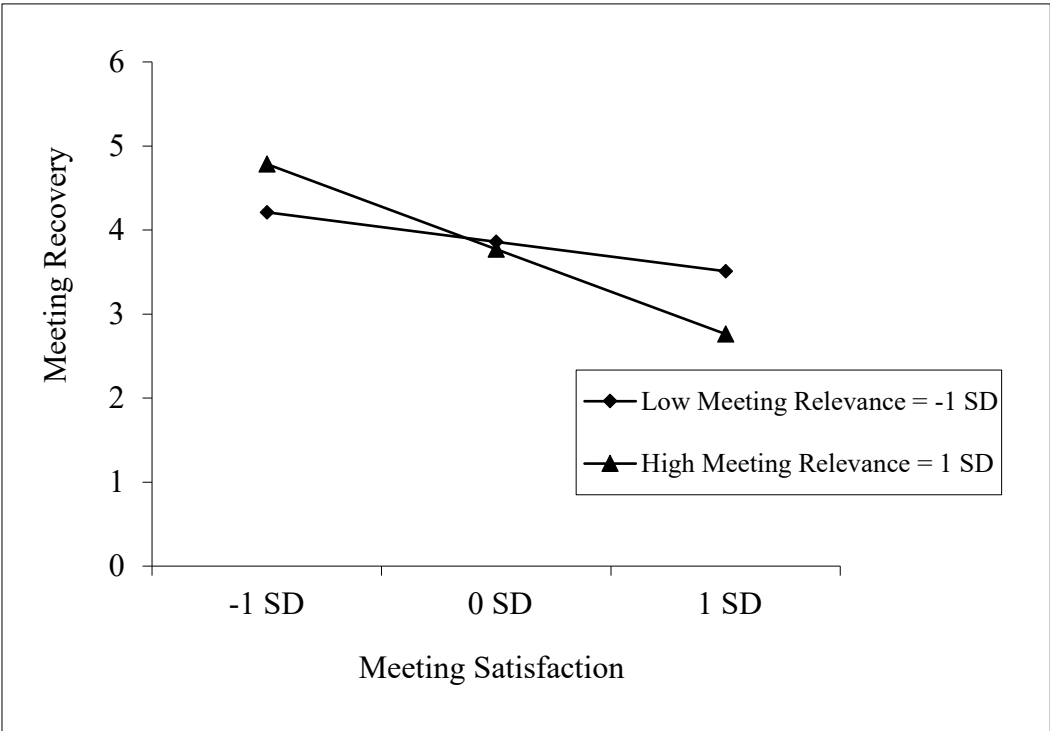
Regression Analysis of Meeting Satisfaction and Effectiveness Regressed onto Meeting Recovery with Meeting Relevance as a Moderator

Variables	Controls	Meeting Satisfaction	Meeting Effectiveness	Satisfaction Moderation Model		Effectiveness Moderation Model	
				Step 1	Step 2	Step 1	Step 2
Controls							
Gender	-0.33	-0.34	-0.30	-0.38	-0.46*	-0.34	-0.41*
Tenure (org.)	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.01
Meeting Process							
Meeting Satisfaction		-0.41**		-0.41**	0.33		
Meeting Effectiveness			-0.39**			-0.15	0.71
Meeting Relevance				-0.01	0.79**	-0.18	0.51
Interaction					-0.17**		-0.22
<i>F</i>	2.41	11.91	4.58	8.91	10.82	4.58	5.31
<i>p</i>	0.09	<0.0001	0.004	<0.0001	<0.0001	0.0015	0.0001
<i>R</i> ²	0.02	0.16	0.07	0.16	0.23	0.09	0.11
ΔR^2		0.14	0.05		0.07		0.00

Note. * $p < .05$. ** $p < .01$, $n=195$

Figure 1:

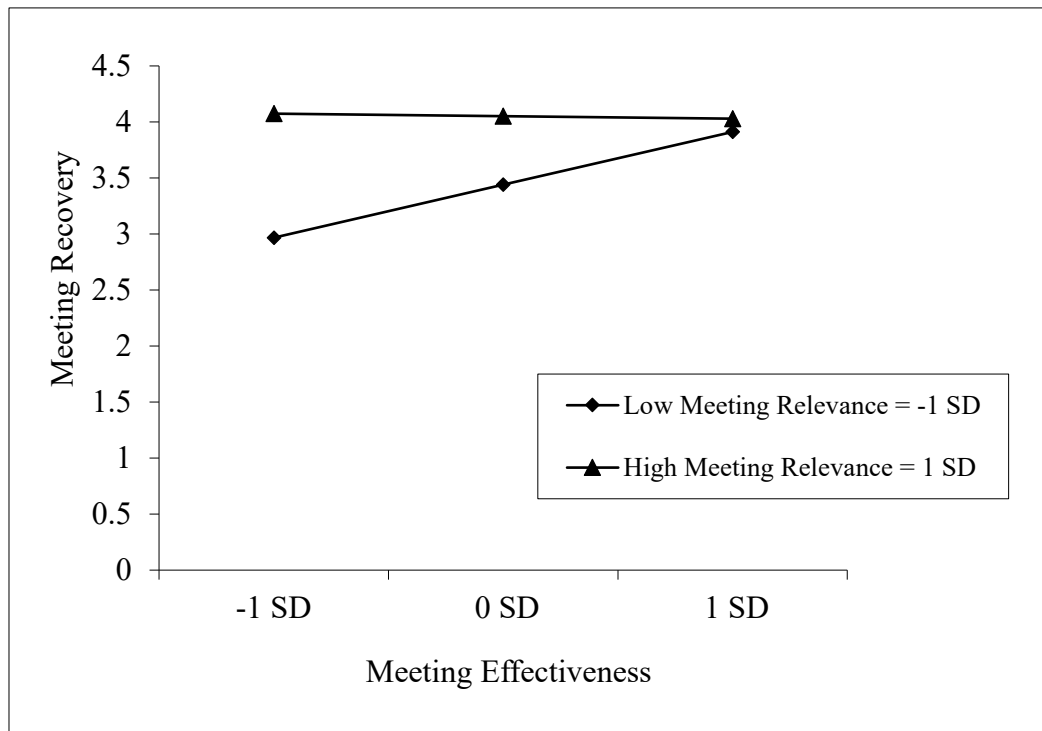
Meeting Relevance Moderating the Meeting Satisfaction to Meeting Recovery Relationship



DRAFT

Figure 2:

Meeting Relevance Moderatign the Meeting Effectiveness to Meeting Recovery Relationship



Appendix A

Items on Final Meeting Recovery Measure

1. I needed time to recover after my last meeting before moving on to other work-related tasks.
2. My last meeting created problems I had to resolve before I could get back to my work tasks.
3. I spent time mulling over my last meeting experience.
4. After my last meeting it was hard to be fully engaged in other work tasks.
5. My work performance was inhibited after my last meeting.
6. I wanted to go home early after my last work meeting.
7. After my last meeting I had a decreased desire to attend meetings in the future.
8. I was frustrated after my last meeting.
9. It took me a long time to recover after my last meeting.
10. I distracted myself from work for some time after my last meeting.
11. It was tough to transition back to meaningful work tasks after my last meeting.
12. It took some effort to get back to work after my last meeting.