

VIRTUAL FEEDBACK, A POWERFUL LEVER IN TEAMS: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Virtual collaboration has become more widespread in recent years making virtual feedback an indispensable means for individual and team success. Throughout the last decades, many researchers examined how virtual feedback is received, processed and whether it even has desired effects, e.g., accounting for effects of distortions in electronic communication. Unfortunately, there is no comprehensive review that structures and summarizes the disparate literature on virtual feedback. We undertake a systematic review of 88 articles on virtual feedback published between 1986 and 2022 in peer-reviewed academic journals in Business, Management, and Psychology Sciences. By drawing on Ilgen et al.'s (1979) feedback process model as a theoretical framework, we analyze the articles due to the multidimensional nature of virtual feedback and address the process by which virtual feedback influences behavior. This work has three major contributions. First, we identify the aspects of virtual feedback from the literature that influence (a) the way it is perceived, (b) its acceptance by the recipient, (c) the willingness of the recipient to respond to the feedback, and (d) the recipients' behavior. This results in a context-specific application of Ilgen et al.'s (1979) feedback process model. Second, this systematic organizing of the literature allows us to identify blind spots in current literature that have not received sufficient scholarly attention and, thus, to propose related future research directions. Third, our implications at both individual and team level demonstrate guidelines for communicating feedback virtually to reduce misunderstandings, promote feedback acceptance, and foster desired effects of virtual feedback.

KEYWORDS

Computer-Mediated Communication, Virtual Collaboration, Virtual Team, Feedback, Feedback Process Model

1. INTRODUCTION

Organizations are increasingly using virtually collaborating teams to support major strategic initiatives in digital transformation (Bartsch et al., 2021). As the importance of teams working remotely increased tremendously due to the COVID-19 pandemic, virtual feedback (also known as digital feedback or computer-mediated feedback) has been playing a crucial role in ensuring team collaboration in a virtual work environment (Karl et al., 2022). Feedback is a powerful intervention for individuals and teams to improve learning, development, and task performance. In this vein, feedback has received considerable research attention as a determinant of individual and team behavior (Gabelica et al., 2014).

The sheer volume of studies on virtual feedback might suggest that research has reached a mature stage of theoretical development. For instance, studies address virtual feedback using various theoretical lenses e.g., by focusing on individual's cognitive processes when receiving virtual feedback (He et al., 2017), and diverse effects of virtual feedback at an individual and team level (Adamovic, 2018). Further, various studies demonstrate that virtual feedback is more limited compared to in-presence feedback due to distortions in electronic communication (e.g., a lack of nonverbal behaviors such as gestures, facial expressions, head nods, and tone of voice) which might hinder to achieve desired effects (Parker & Grote, 2020). Virtual feedback is transmitted by information and communication technologies (ICTs) and refers to information about actual performance of a system used to control the future actions of a system (Hertel et al., 2005). Hence, Johnson & Connelly (2014) argue that "We also cannot be completely certain that informal feedback functions the same in an online versus a face-to-face context" (p.1284). Referring to this previous work, it seems that individuals process feedback differently when communicated in a virtual work environment than in an in-person

conversation. Consequently, in-presence feedback might not be fully transferrable to virtual feedback due to existing challenges salient in the virtual context, e.g., distractions in electronic communication.

Despite the growing body of literature on virtual feedback, clear questions about what research has been conducted, what it has found, what is missing, and what should be further explored and examined to advance the literature related to virtual feedback are yet to be answered. In addition, factors influencing individuals' cognitive processes and behavior when receiving feedback by computer mediated communication remain unclear.

These are issues best addressed by conducting a systematic literature review. As a comprehensive overview on virtual feedback is still missing in the literature, we undertake a systematic review of 88 articles on virtual feedback published between 1986 and 2022 in peer-reviewed academic journals in Business, Management, and Psychology. We draw on Ilgen et al.'s (1979) feedback process model to analyze the articles by addressing the multidimensional nature of feedback as well as the process by which feedback influences behavior. Due to distortions in electronic communication and contradictory findings in the literature, we need to understand the factors affecting a feedback recipient's information processing in a virtual work environment.

Such a systematic literature review is worthwhile for at least three reasons. First, we contribute to existing works by revealing the aspects of virtual feedback that influence (a) the way it is perceived, (b) its acceptance by the recipient, (c) the willingness of the recipient to respond to the feedback, and (d) the recipients' behavior. This results in a context-specific application of Ilgen et al.'s (1979) feedback process model that demonstrates the model's elements examined in the virtual context and those elements which are still lacking empirical investigation. Second, we pave the way for future research by identifying gaps in the literature and proposing related directions for future research. Third, we derive implications for scholars and practitioners on both individual and team level to advance understanding of virtual feedback.

2. THEORETICAL FRAMEWORK

Grounded in environmental psychology, the stimulus-organism-response (SOR) model provides the theoretical basis for explaining individual behavior (Mehrabian & Russell, 1974). This framework demonstrates that clues (stimulus) perceived from the environment can trigger an individual's internal assessment state (organism), which in turn leads to a specific behavior (response) (Mehrabian & Russell, 1974). For instance, a stimulus is the influencing factor of an external environment which affects an individual's cognitive and emotional states and, thus, produces approach or avoidance responses (Bigne et al., 2020). Ilgen et al. (1979) developed the feedback process model for explaining individual behavior stimulated by feedback, which is depicted in figure 1. The model includes factors relating to the entities involved in the feedback delivery, namely, the provider, the message, the recipient as well as the underlying cognitive processes that explain the recipient's reactions to feedback (Ilgen et al., 1979). As Ilgen et al. (1979) established a foundation for subsequent research on feedback, this framework provides a sound basis for organizing and integrating literature on virtual feedback (Wang et al., 2014).

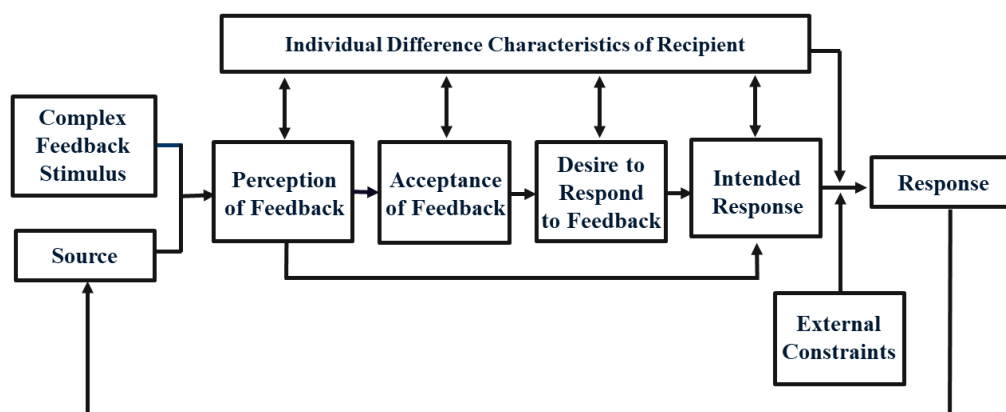


Figure 1. Feedback process model (Ilgen et al., 1979)

3. METHODOLOGY

To ascertain the state of the academic discussion about virtually communicated feedback in teams in the business and management context, the authors performed a systematic review and a content analysis. Therefore, this article adopts a systematic approach as explained by Petticrew & Roberts (2008) for reviewing the literature. Finally, by drawing on Ilgen et al.'s (1979) feedback process model we code and analyze the literature to reveal elements related to the source, the message, the recipient as well as the underlying cognitive processes that explain the recipient's reactions to virtual feedback in computer mediated communication. The authors base the description of the methodological approach on the RAMESES scheme, which provides guidelines for conducting a meta-narrative review (Wong, Greenhalgh, Westhorp, Buckingham, & Pawson, 2013). Referring to the databases Web of Science, EBSCO, and Google Scholar, we screened the existing literature and related fields to identify works addressing computer-mediated feedback in virtual teams. We depict the literature review process in figure 2.

Using an extensive list of relevant search terms, we search journals in the fields of Management, Business, and Psychology. At this stage, we also corrected for inter-category and inter-database doublets with and between both databases, leading to a total of 5,732 published articles.

In the second step, we screened titles and abstracts of the articles, each applying pre-defined in- & exclusion criteria. We excluded articles with contextual misfit, thus, excluding all articles not focusing on virtual collaboration in teams. Further, all articles with search terms part of a formulation with different meaning were excluded, e.g., social information space and online feedback forums. Afterward, we screened all titles of the articles applying these criteria resulting in 1,584 papers. Of these articles, we excluded 1,470 papers by screening all abstracts of the articles applying these criteria.

This process left the author with 114 papers to analyze. Of these articles, the authors excluded another 26 at a later stage because six articles did not fit to language and 20 articles were inaccessible and after directly contacting the authors. These steps lead to an overall 88 articles included and analyzed in-depth in this literature review.

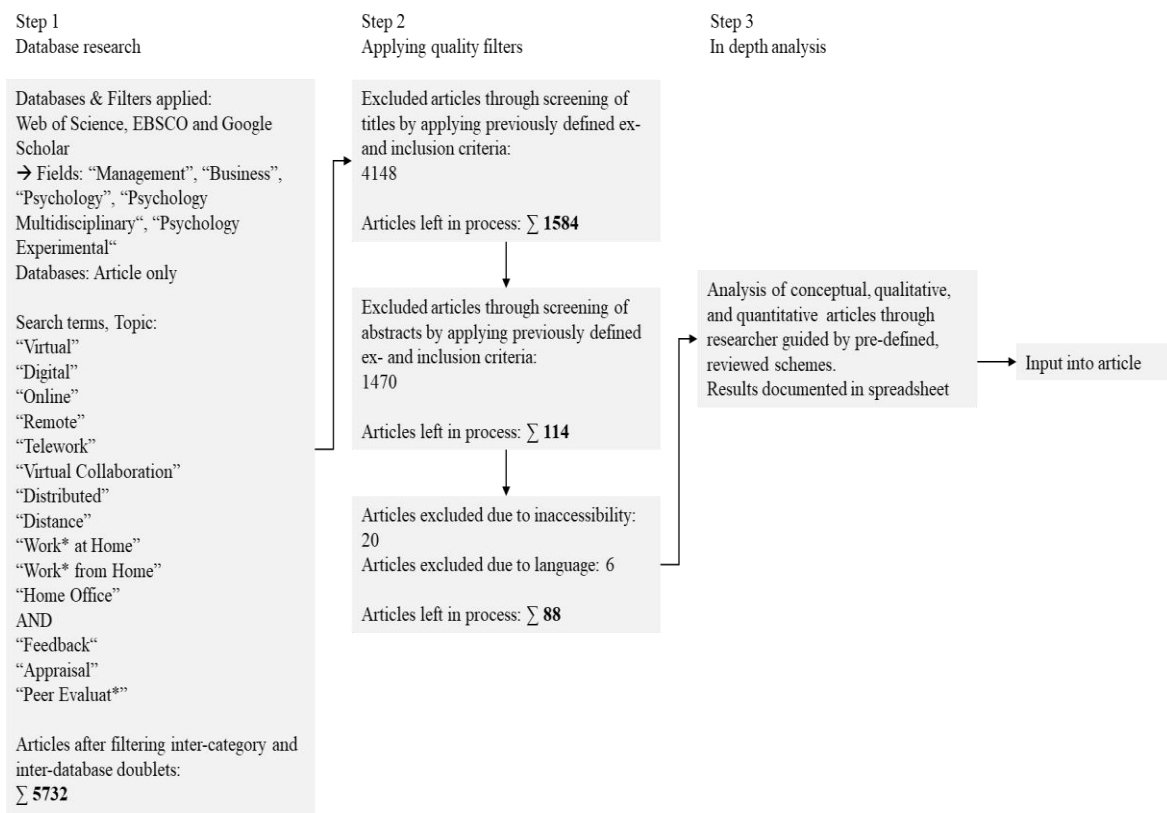


Figure 2. Literature review process

The authors analyzed the content of the articles due to their a) theoretical and b) methodological approach, and c) elements of Ilgen et al.'s (1979) feedback process model.

4. RESULTS

We integrate the components of Ilgen et al.'s (1979) feedback process model into the SOR model to visualize the stimuli of virtual feedback, which then influence individual's cognitive states and, thus, lead to a response at an individual and team level. This results in a conceptual framework that provides a sound basis for organizing and integrating the literature on virtual feedback in teams. This approach helps us to identify gaps in the literature and to suggest future fields of research. Figure 3 depicts our conceptual framework that reveals the elements examined in literature on virtual feedback.

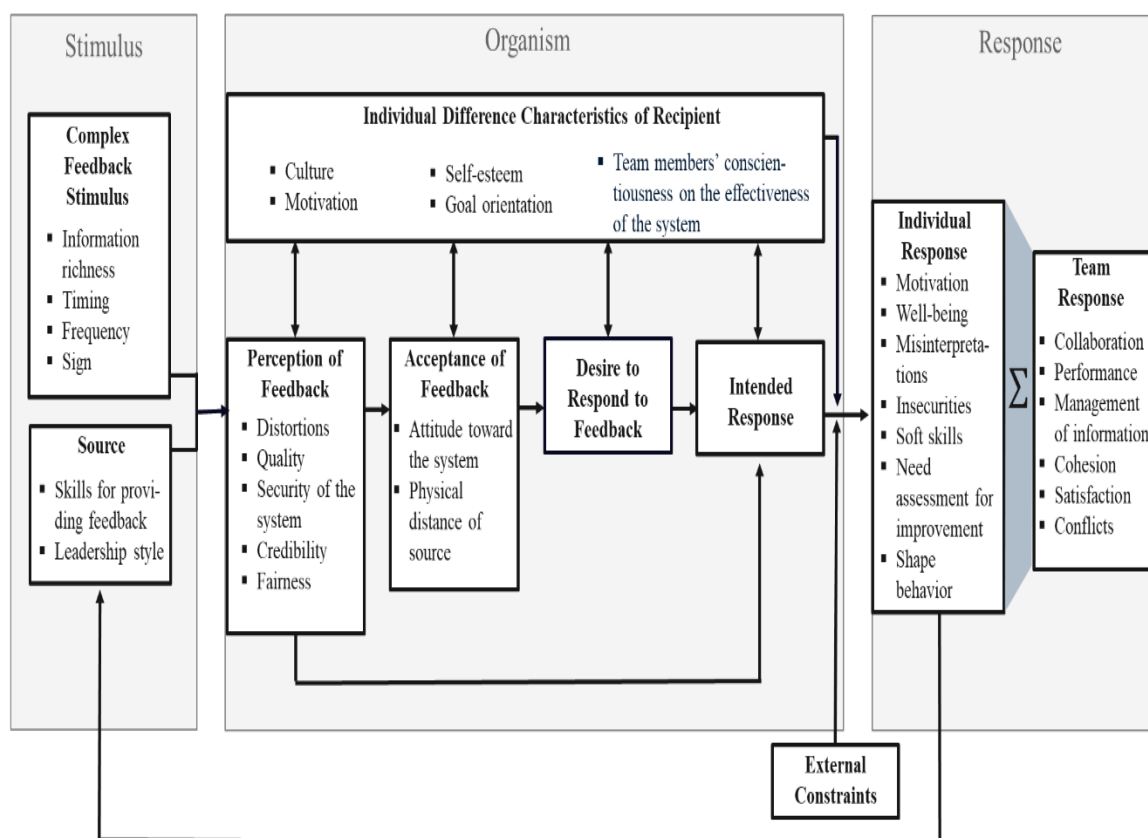


Figure 3. Conceptual framework of virtual feedback in teams

4.1 Stimulus

We demonstrate the complex feedback stimulus and source as stimuli in the environment influencing an individual's cognitive processes to explain the recipient's reactions to feedback. The complex feedback stimulus was examined by researchers due to its sign, information richness, timing, and frequency. For example, literature on virtually communicated feedback reveals that the sign of the feedback message is rather positive or negative. Whereas a positive sign refers to a positively worded feedback message and can signal an individual's or team's adequate behavior, a negative sign relates to a negatively worded feedback message and can signal an individual's or team's inadequate behavior (Kahai & Cooper, 2003).

In terms of information richness, media vary based on the capacity to transmit cues and facilitate shared meaning within a given time interval (Daft & Lengel, 1986). Thus, Eisenberg et al. (2021) demonstrate that rich feedback is enabled by media that is rich in cues e.g., face-to-face and video conferencing allowing immediate verbal and non-verbal interactions, such as facial expressions, gesture, head nods, and tone of voice. In contrast, feedback that is lean in cues is written media e.g., e-mail or instant messaging by containing fewer verbal and non-verbal cues (Eisenberg et al., 2021). Thus, Friedman & Currall (2003) show that the richness of feedback diminishes in e-mail compared to personal conversations because nonverbal behaviors are reduced in electronic communication.

Researchers addressed the source regarding the skills for providing feedback virtually as well as the leadership style. On the one hand, individuals should feel comfortable when giving feedback virtually, which implies their adequate use of ICTs (Payne et al., 2009). On the other hand, feedback providers should have the skills to offer both, positive and negative feedback in a constructive way and friendly manner (Breuer et al., 2020).

4.2 Organism

The organism explains the effect of stimuli on an individual's and team's response. Literature on virtual feedback reveals perception of feedback and acceptance of feedback as cognitive states to demonstrate "how" a stimulus leads to a response.

For example, literature on virtually communicated feedback demonstrates such distortions in terms of perceived bandwidth limitations (Powers et al., 2011). When bandwidth is limited in video-mediated communication, recipients perceive an audio-visual delay in feedback (Powers et al., 2011). Such delays vary in their strength as they might be small and not consciously perceived by individuals, or they might be obvious and lead to increased levels of interrupted speech (Powers et al., 2011).

Driskell et al. (2003) mention that the physical distance of individuals in a virtual team environment may affect how feedback is evaluated. Feedback is more likely to be accepted from sources that are psychologically closer to the recipient than from those more distant. Thus, the researchers suggest that recipients might accept feedback less readily from individuals in a virtual team environment who are seen as more remote or removed from the immediate social setting (Driskell et al., 2003).

Our analysis of literature on virtual feedback revealed that no article addressed an individual's desire to respond and intended response to virtual feedback.

Further, a recipient's individual characteristics influence these cognitive states. For example, in culturally diverse teams, the same computer-mediated feedback was interpreted in different ways depending on national culture of the team members (He et al., 2017).

The analysis of literature on virtual feedback revealed that no article addressed an individual's external constraints which might influence the response to virtual feedback.

4.3 Response

Researchers have examined the effects of virtually communicated feedback on individual and team response. On an individual level, effects of virtual feedback are demonstrated in terms of motivation, well-being, misinterpretations, insecurities, soft skills, need assessment for improvement and shape behavior (Sardeshmukh et al., 2012, Martínez-Argüelles et al., 2015; Powers et al., 2011). The results regarding outcomes of virtual feedback on a team-level can be described as mixed. Besides intensely investigated topics, such as the effects of virtually communicated feedback on team collaboration and performance, further effects of virtual feedback like the management of information, cohesion, satisfaction, and conflicts have been addressed by researchers (Gerards et al., 2020; Chen et al., 2019; Johnson & Connelly, 2014).

5. RESEARCH OPPORTUNITIES MOVING FORWARD

In the prior section, "Results" we addressed the literature on virtually communicated feedback for moving this research stream forward – connecting the diverse works due to the dimensions of Ilgen et al.'s (1979) feedback process model. This provides a comprehensive way to specify theoretical overlaps of related studies by

focusing on all entities involved in the feedback process. Our results demonstrate that previous works mostly addressed the complex feedback stimulus, the recipient's perception of the message as well as effects of feedback on an individual and team level. Thus, it seems surprising that further cognitive variables which are of strong relevance for processing feedback, such as acceptance of feedback, desire to respond to feedback, intended response and external constraints were slightly or not addressed in research on virtually collaborating teams. Figure 4 depicts opportunities for future fields of research on virtually communicated feedback in teams. Here we discuss these opportunities for further research, again reviewing extant literature where relevant.

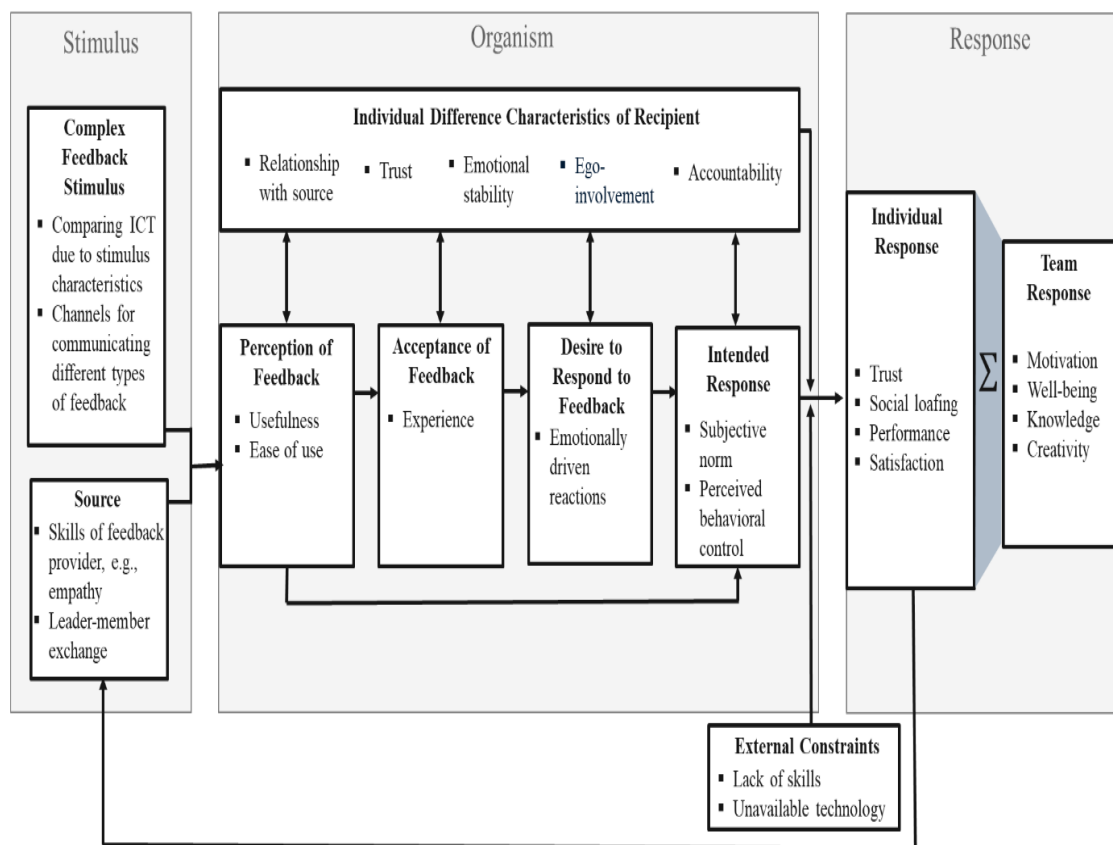


Figure 4. Future fields of research for virtually communicated feedback in teams

Studies have investigated stimuli in the environment influencing an individual's cognitive processes to understand the recipient's reactions to virtual feedback. However, comparing diverse ICTs, e.g., videoconferencing, Metaverse, and email for communicating virtual feedback due to their effects on individual's cognitive processing of the feedback is uncharted territory. Whereas the comparison of different channels for communicating feedback is not new, researchers have so far focused solely on effects of feedback when being rated with an online feedback system compared to a traditional paper-and-pencil system (see Payne et al., 2009). Due to contradictory findings in previous research (see Johnson & Connelly, 2014), diverse channels for communicating virtual feedback might have different effects on individuals' cognitive processes, e.g., in the perception and acceptance of feedback. Therefore, there are many questions that need to be answered: For example, which ICTs should be chosen by virtual team members to communicate positively or negatively framed feedback in order to be accepted and used by the recipient? Depending on the variety of ICTs, what is the adequate timing and frequency for communicating feedback to be accepted? This would allow scholars and practitioners to select contextually appropriate channels to deliver diverse types of feedback.

As acceptance of feedback is a cognitive variable of strong relevance for processing feedback, we encourage researchers to investigate individual's acceptance of virtually communicated feedback to help advance this underexplored area. For instance, future studies should address if an individual's previous experiences with feedback might influence a recipient's acceptance of digital feedback. Thus, an employee might not accept virtual feedback if such feedback has not led to a desired result in the past, e.g., due to a lack of resources in terms of digital skills or digital infrastructure.

As no article addressed an individual's desire to respond to virtual feedback in our analysis of literature, we call for more investigations on this cognitive factor. This would enhance scholars' understanding of the feedback process in a virtual work environment. As the desire to respond to feedback is described as the individual's willingness to react to the received feedback, it seems that this cognitive step is strongly based on an individual's rationality in Ilgen et al.'s (1979) feedback process model. Consequently, it seems that emotional reactions of an individual towards the received virtual feedback are still strongly neglected. As the effect of acceptance of feedback to desire to respond was not yet investigated in the context of a virtual working environment, we lack knowledge on an individual's reaction towards the digital feedback if, e.g., the digital feedback is not accepted by the recipient. Especially in situations when virtual feedback is not related to work aspects but to the recipient's personality, e.g., in developmental feedback, virtual feedback might provoke affective emotional reactions of the recipient when being misunderstood.

6. IMPLICATIONS

Our systematic literature review draws important implications for practice. First, we recommend that supervisors and employees should be well-trained to provide high-quality feedback to their co-workers by using ICTs and online feedback systems. Virtual feedback should include detailed information about an individual's improvement, as well as ways how to achieve such an improvement (Payne et al., 2009).

Second, teams should strive to communicate virtual feedback frequently, concretely, and timely both on the individual and the group level. This is particularly important due to the disconnectedness among team members and lack of rich face-to-face interaction inherent to virtual team settings, where information about the goal achievement of the other team members is more difficult to receive (Hertel et al. 2005). This can be accomplished by setting specific guidelines regarding feedback frequency, meeting times, and specific agendas for discussion (Kayworth & Leidner, 2000).

Third, we recommend supervisors and co-workers to choose adequate ICTs to communicate feedback virtually due to the communication needs. Whenever group discussions, e.g., on critical issue in a software project, require a rich communication channel due to the need for immediacy of feedback, high group interactions, and the need to view co-workers' reactions on comments in a synchronous manner, we recommend using media that is rich in cues e.g., video conferencing. This would allow immediate verbal and non-verbal interactions, such as facial expressions, gesture, head nods, and tone of voice to reduce risks for misunderstandings, and to lead to feedback acceptance and desired outcomes. In contrast, e-mail might be effectively used for communication needs requiring less interaction among co-workers as well as less immediate feedback (Kayworth & Leidner, 2000).

Forth, distortions in terms of bandwidth limitations should be eliminated when communicating feedback virtually. To reduce misinterpretations of the feedback message and conflicts caused by delayed feedback, supervisors and employees should be aware of possible distortions and, thus, react quickly to appearing bandwidth limitations. For example, the video function in video conferences should be switched off when bandwidth limitations appear to reduce audio-visual delay.

7. CONCLUSION

Throughout the last decades, researchers addressed virtual feedback under various theoretical lenses. Due to distortions in electronic communication and contradictory findings in the literature, virtual feedback might be processed differently by individuals than feedback communicated in person. To synthesize and comprehensively structure the disparate literature, we undertook a systematic review of 88 articles on virtual feedback published between 1986 and 2022 in peer-reviewed academic journals in Business, Management, and

Psychology Sciences. We draw on Ilgen et al.'s (1979) feedback process model to analyze the articles by addressing the multidimensional nature of feedback as well as the process by which feedback influences behavior. This work has three major contributions. First, we identify the aspects of virtual feedback from the literature that influence (a) the way it is perceived, (b) its acceptance by the recipient, (c) the willingness of the recipient to respond to the feedback, and (d) the recipients' behavior. This results in a context-specific application of Ilgen et al.'s (1979) feedback process model. Second, this systematic organizing of the literature allows us to identify blind spots in current literature that have not received sufficient scholarly attention and, thus, to propose related future research directions. Third, our implications at both individual and team level demonstrate guidelines for communicating feedback virtually to reduce misunderstandings, promote feedback acceptance, and foster desired effects of virtual feedback.

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