

Hemshorn de Sanchez, Clara Sofie; Gerpott, Fabiola H.; Lehmann-Willenbrock, Nale

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## REVIEW ARTICLE

# A review and future agenda for behavioral research on leader–follower interactions at different temporal scopes

Clara Sofie Hemshorn de Sanchez<sup>1</sup>  | Fabiola H. Gerpott<sup>2</sup>  |  
Nale Lehmann-Willenbrock<sup>1</sup> 

<sup>1</sup>Department of Industrial and Organizational Psychology, University of Hamburg, Hamburg, Germany

<sup>2</sup>Management Group, WHU – Otto Beisheim School of Management, Vallendar, Germany

## Correspondence

Clara Sofie Hemshorn de Sanchez,  
Department of Industrial and Organizational Psychology, University of Hamburg, Von-Melle-Park 5, Hamburg 20146, Germany.  
Email: clara.sofie.hemshorn.de.sanchez@uni-hamburg.de

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## Summary

Scholars are increasingly embracing innovative research designs and measures to capture actual leader and/or follower behaviors in real interactions. Our systematic review of this emerging research stream and development of a research agenda seeks to move the literature further in this direction. Specifically, we aim to inspire scholars with techniques for observing, manipulating, or training actual leadership and/or followership behaviors at different temporal scopes in the laboratory or field and identify which future research areas are worth exploring. To achieve these aims, we perform a review of existing studies in this domain according to their underlying conceptual model and temporal scope. We analyze which types of leader or follower behaviors (i.e., verbal behavior, text-based behavior, choice behavior, gaze, facial expressions, gestures, voice tone and pitch, movement cues, and unspecified nonverbal behavior) have been studied, how they have been studied (i.e., using which methodological approaches), and in which study context (i.e., laboratory or field). We distill these findings to derive six future research directions: conducting studies that connect actual and perceived leader/follower behaviors, considering temporal granularity in a nuanced manner, exploring interdependent behavioral patterns, leveraging unconventional research methods, performing multimodal behavior analyses, and conducting more studies “in the wild” (i.e., field research).

## KEYWORDS

communication, follower behavior, leader behavior, nonverbal behavior, time

## 1 | INTRODUCTION

Leadership can be defined as a formal or informal, contextually rooted, and goal-influencing process that occurs between leaders and followers (Day & Antonakis, 2012). In a process-oriented definition of leadership, social interactions take center stage (Uhl-Bien, 2006). Accordingly, leadership constitutes an interactional phenomenon that

unfolds through discrete observable behaviors (e.g., Gerpott et al., 2019; Uhl-Bien, 2006). This conceptualization of leadership has resulted in a growing scientific interest in observing, manipulating, or training actual leader behaviors; the effects thereof on the behaviors and perceptions of followers; and the dynamics between leader and follower behaviors that unfold over time. Focusing on the behavioral building blocks of leadership and followership in specific temporal

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contexts can contribute to the development of process theories (Acton et al., 2019; Fischer et al., 2017; Hanna et al., 2021), advance our understanding of the role of time in leadership (McClean et al., 2019; Shamir, 2011), capture the interplay between leaders and followers more accurately (Uhl-Bien, 2006; Uhl-Bien et al., 2014), and ultimately have a greater impact on developing more effective leaders in organizations and societies (Gardner et al., 2020).

Although several reviews have examined the downstream consequences of leader behavior (e.g., Ceri-Booms et al., 2017; DeRue et al., 2011; McClean et al., 2019), they have largely included studies that exclusively rely on followers' *perceptions* of leader behavior instead of actual leader *behavior*, with such perceptions often being captured at one point in time. Furthermore, it is notable that studies and reviews on leader behavior have rarely focused on follower *behavior* as a central ingredient in the construction of leadership (Bastardo & van Vugt, 2019; Uhl-Bien et al., 2014). Perceptions of leader behavior obtained via self-reports ostensibly provide a valuable inward-directed perspective on an individual and their understanding of others (Behrendt et al., 2017). Nevertheless, because people's perceptions are often biased, such perceptions do not necessarily reflect what actually occurred in a particular interaction (e.g., Hansbrough et al., 2015; Lee et al., 2015). From a practical perspective, this potential inaccuracy impedes deriving assumptions concerning the concrete behaviors that leaders and/or followers should learn and develop. For instance, should a follower know that the performance outcomes of their leader are positive, the follower may tend to rate the leader positively on any behavior that could theoretically explain the high performance—even though, in reality, these behaviors may be unrelated to the leader's performance. Training leaders to perform behaviors identified in such a manner, however, may not necessarily improve performance. From a theoretical perspective, the numerous limitations of questionnaire research—including, among others, the fact that the use of perceptual measures of leadership has played a considerable role in upholding ill-defined or tautological constructs such as transformational leadership (van Knippenberg & Sitkin, 2013; Yukl, 1999) and fostered the study of nonconsequential outcomes—have been labeled “inconvenient truths,” and scholars have ignored these for too long (Fischer et al., 2020). The failure to address these limitations has ultimately resulted in a crisis in the leadership field, which has been reflected in several recent publications (e.g., Antonakis et al., 2016; Eva et al., 2019; Fischer et al., 2021; Gottfredson et al., 2020; Rudolph et al., 2020, 2021) criticizing vague leadership constructs and calling for research that goes back to the drawing board to identify unique behavioral building blocks (i.e., concrete behaviors that build the foundation of broader leadership styles) to be used to differentially predict specific outcomes.

Evidently, behavior-based research does not represent a solution to all problems in the leadership field and certainly requires greater investment of resources on the part of scholars and increased commitment by participants. Ultimately, people act upon their perceptions of behaviors, and research has repeatedly found substantial differences between reported and observed behavior in leadership studies (e.g., Hansbrough et al., 2015; Lee et al., 2015). However, whereas

survey designs can shed light on one (perceived) side of the coin, they can scarcely illuminate the other side—namely, what leaders actually do or how followers truly react as opposed to the hypothetical responses they provide to a questionnaire. Only if we illuminate both sides of the coin can we draw a complete picture of how leadership is created as leaders and followers interact and form perceptions of one another. Against this background, we expand the literature beyond prior reviews, the majority of which relied on followers' *perceptions* of leader behavior (e.g., Ceri-Booms et al., 2017; DeRue et al., 2011; McClean et al., 2019) and instead offer a systematic review of studies that have observed, manipulated, or trained *actual* leader and/or follower behaviors.

Our analysis of extant studies answers the question of how behavior-based research has studied leadership and followership from perspectives that go beyond the possibilities of designs that exclusively rely on surveys and self-reports. Furthermore, focusing on actual leader and/or follower behavior implies that insights regarding the role of *time* can be more easily derived than from questionnaire-based studies, as behaviors can be sampled at a much higher rate. To illustrate, while it would be highly disruptive to ask leaders or followers to continuously fill in questionnaires throughout a meeting, videotaping a meeting interaction allows one to code all observed verbal and nonverbal behaviors retrospectively, resulting in a fine-grained temporal scope. We adopt the concept of time-theoretical levels developed in team research (cf. Klonek et al., 2019) to accurately map extant behavior-based leadership research on five time-theoretical levels: nano-, micro-, meso-, macro-, and giga-time. The results of this analysis can inform leadership scholars about underrepresented temporal levels, thus allowing them to pinpoint where exactly the role of time requires more scientific attention (Castillo & Trinh, 2018; Shamir, 2011). Lastly, although our work is grounded in a review of empirical studies, it has theoretical implications for overcoming the crisis in the leadership field because it indicates which behavioral types (i.e., verbal behavior, text-based behavior, choice behavior, gaze, facial expressions, gestures, voice tone and pitch, movement cues, and other nonverbal behaviors) are understudied and thus also underrepresented in current conceptualizations of leadership styles.

Our review offers two key contributions. First, we provide an integrative overview of the underlying questions addressed in previous behavior-based research on leader–follower interactions by aggregating existing studies according to their underlying conceptual models, thereby also categorizing extant studies based on their temporal scopes into nano-, micro-, meso-, macro-, and giga-time. Clarifying which research questions have been addressed at which temporal scope allows for identifying understudied areas and critically reflecting on the underlying reasons, which may provide guidance for scholars who wish to exploit the full potential of behavioral data. Our review findings serve as the foundation for discussing research directions 1–3, namely, developing theories and collecting data that connect actual and perceived leader and follower behavior, analyzing data over time and at more than one temporal level, and analyzing interdependent behavioral patterns between leaders and followers. Second, we provide scholars with a systematic overview of the types of behaviors

that have been studied using different methodological approaches (i.e., observation, training/manipulation, and critical incidents) in lab or field settings. Through this overview, we hope to inspire scholars to explore the richness of behavioral data and to serve as a “go-to” reference list indicating how research questions related to leader–follower interactions can be appropriately tested with designs that capture actual behavior. We utilize the insights from this overview to elaborate on research directions 4–6, namely, to encourage leadership scholars to leverage unconventional data collection methods, develop theories and analyze multimodal interaction patterns, and spend more time studying leader–follower interactions “in the wild”—that is, in their real-life context.

## 2 | LEADER–FOLLOWER INTERACTIONS AT DIFFERENT TEMPORAL SCOPES

Understanding leadership as a temporal process or a sequence of discrete behaviors that evolves through interactions between leaders and followers over time (e.g., DeRue et al., 2011; Morgeson et al., 2010; Uhl-Bien, 2006) requires reflecting on what is meant by the terms “behavior” and the “temporal scope” at which the behaviors of interest unfold.

### 2.1 | What is meant by “behavior”?

There is an ongoing debate in the general behavioral research literature on what is considered behavior (Agnew et al., 2010; Henriques & Michalski, 2020). Henriques and Michalski (2020) illustrate the complexity of this construct through categorizing it at four levels: matter (e.g., atoms), life (e.g., bacteria and plants), mind (e.g., animal behavior), and, finally, culture (e.g., people’s socio-linguistic behavior). The appropriate level or type of behavior to be investigated is determined based on the level on which the research question focuses. Following this model, scholars who want to understand what the experience of leadership or followership means to an individual’s perceptual process and potentially to their biological system may want to study brain mechanisms (mind level) or even cellular behavior (life level). In contrast, should we want to understand leadership as an interactional phenomenon that unfolds through discrete, observable behaviors (e.g., Gerpott et al., 2019; Uhl-Bien, 2006)—which is what we focus on in this review—we would need to investigate behavior at the cultural level. This level of behavioral complexity refers to “the shared, socially constructed reality of human persons, and their systems of verbal communication and propositional meaning making” (Henriques & Michalski, 2020, p. 341).

We define the term *behavior* at the cultural level as any overt conduct on the part of a person that is *observable* and *functionally relevant* in the present moment (Kelly & Agnew, 2012; Uher, 2016). The reference to the present moment emphasizes that behavior is different from development (Uher, 2016). Furthermore, note that this definition includes both actions and inactions, as not reacting to a given

behavior (e.g., not responding to a question) is observable and functionally relevant in a given social context (e.g., showing disinterest). Observable behaviors include verbal utterances, text-based behavior, and nonverbal behavior (e.g., gaze, facial expressions, gestures, movement cues, and voice tone and pitch). Internal bodily functions such as heartbeat or galvanic skin response, neurotransmitter activities, and cognitive processes (e.g., thinking, reflecting, internal processing, and sensemaking) are excluded from the observable behaviors at the socio-linguistic level. It should be noted that while our definition entails that answering a questionnaire is an observable behavior (i.e., the behavioral act of ticking answer categories), this would only fall within the scope of this review in the unlikely event that the ticking behavior itself is of focal interest to the researcher. However, should a study focus on investigating phenomena such as perceptions of inner convictions, perceived behaviors, or attitudes via questionnaires such that ticking a box in a questionnaire serves only as a proxy for these phenomena, that study would not be included.

### 2.2 | What is meant by “temporal scope”?

Scholars can account for time in theoretical models and research designs in various ways. For example, McClean et al. (2019) developed theory specifying the *degree* and *pattern* by which leader behavior dynamically change over time. Their research describes the steepness of trajectories or the patterns of cyclicity in leader behavior (i.e., shift, growth and decay, ebb, and flow). Such trajectories or patterns can unfold over timeframes ranging from milliseconds to years. Developing a language with which to accurately describe the temporal scope of leadership and followership research would be an important step toward developing theoretical models that are able to precisely predict leader–follower interactions. To illustrate why doing so is theoretically meaningful, consider the following example: Within a single meeting, leaders may promote higher meeting satisfaction and a more productive meeting outcome by uttering solution-oriented statements at a high frequency (Lehmann-Willenbrock et al., 2015). In the long term, however, an excessive focus on creating solutions could lead to a lack of problem-orientation, which could result in teams overlooking important shortcomings in the project work. Thus, while a behavior may have positive results at a small temporal scope, it may result in problematic patterns at higher temporal levels.

While conceptual work on leadership and followership has often remained silent regarding the timeframes that should be considered when observing a phenomenon of interest (Castillo & Trinh, 2018; Shamir, 2011), scholars conducting empirical studies must decide on the temporal scope at which they will collect their data on leader–follower interactions. In that regard, the team dynamics literature can contribute to thoroughly classifying extant leadership research in terms of its temporal scope because scholars in the team dynamics domain have long discussed the theoretical importance of defining timeframes for topics of interest (e.g., Kozlowski, 2015; Kozlowski & Klein, 2000; Schecter et al., 2018).

To accurately describe the temporal scopes of studies, we rely on the time-theoretical levels proposed by Klonek et al. (2019): nano-time (leader–follower interactions or behaviors that evolve within microseconds or frames per second), micro-time (leader–follower interactions or behaviors that evolve over the course of seconds, minutes, or an hour), macro-time (leader–follower interactions or behaviors that evolve over multiple days or weeks), and giga-time (leader–follower interactions or behaviors that evolve over several months/years). Recognizing that there is a significant difference between micro- and macro-time, we further add the meso-level as a fifth time-theoretical level. This level refers to behaviors that evolve over the course of a day because it is plausible to assume that leadership scholars may use diary studies or experience sampling data to capture daily fluctuations in leader and/or follower behavior.

### 3 | METHODOLOGY OF THE REVIEW

We conducted a multi-step systematic literature review. For all steps, we applied the following formal inclusion criteria: (a) published in English; (b) peer-reviewed, empirical journal articles, or articles in preparation for submission; (c) included participants who were at least 18 years old; (d) studies conducted in lab or field settings; and (e) positioned within the disciplines of organizational behavior, psychology, communication, management, economics, anthropology, or sociology. Furthermore, to identify studies that observed, manipulated, or trained actual leadership and/or followership behaviors, we defined two inclusion criteria: First, a study had to consider both leader *and* follower roles. This included research on initially leaderless teams that researchers studied to advance our understanding of emergent leadership processes, as well as experimental and laboratory studies with leader and follower roles (either because participants were assigned to one of the roles or because they interacted in these roles when working on a task or confronted with a stimulus). For field studies, this criterion meant that both employees and supervisor/managers had to have participated in a study. For instance, intervention studies on leadership training programs were only considered if they involved employees at any point (e.g., employee ratings of leaders pre- and post-training). In contrast, studies that assessed interactions between CEOs and other parties, such as shareholders (Hou et al., 2017; Kolev et al., 2017) or feedback from the media (König et al., 2018; Shani & Westphal, 2016), were not included because they did not involve direct followers.

Second, studies needed to capture, manipulate, or train *real* (actual) behavior of leaders and/or followers. We applied a broad understanding of this criterion, meaning, for example, that researchers trained leaders or followers on a specific behavior in the context of a development program but then “only” captured leader and/or follower perceptions of changes in behavior. Furthermore, experimental designs with confederates were included if the latter took over the role of the leader or the follower(s) and exhibited instructed behaviors to observe how leaders and/or followers would react to this behavior.

Alternatively, scholars could also assign leader and follower roles and provide participants with detailed instructions on how to behave in their role as a leader or follower, such as requiring them to behave in a particularly cooperative way (i.e., behavioral manipulation). Lab studies that investigate leader–follower interactions through independent observations or other objective methods (e.g., eye-tracking) also fulfill this criterion. For research employing text vignettes, this criterion meant that only studies that involved displaying *actual* behavior in the form of written messages (e.g., a supervisor's email or a dean's speech) were included. Vignettes describing a leader's (or follower's) behavior in more general terms were not included (e.g., Braun et al., 2018). Furthermore, we excluded diary studies that relied on survey instruments that were administered over several time points during the course of a day or week because while this method captures a temporal component of leader–follower interactions, it captures perceptions of behavior, as opposed to actual behavior. Lastly, we also did not include studies that utilized agent-based models of leadership (e.g., Castillo & Trinh, 2018) because although they include data at a high temporal resolution, they do not investigate actual behavior.

We followed five steps to identify studies that met the two inclusion criteria. During each step, we scanned the titles and abstracts of identified articles to verify whether they met the inclusion criteria. In cases of doubt, we analyzed the studies' methods sections in detail. In the first step, we searched the databases Web of Science, EBSCOhost, and PsychINFO using keywords that cover leader and follower behaviors as well as methods used to capture these behaviors. The complete search string is provided in Supporting Information S1A. Once the search string was applied to all three databases, we combined the results into a single data set that consisted of 41,299 titles. We then cleaned this data set by deleting duplicates as well as articles belonging to irrelevant disciplines (e.g., animal research, cell biology research, and clinical research). The remaining titles were scanned, and irrelevant titles were excluded, which reduced the number of potentially relevant articles to 2,836. We then read the abstracts of these publications, which reduced the database by another 1,852 articles that obviously did not meet the inclusion criteria. The remaining 985 articles were examined in greater detail, with particular attention being paid to each article's methods section, resulting in a set of 209 articles. In the second step, we inspected the last 5 years of publications in the *Journal of Organizational Behavior*, *Journal of Applied Psychology*, *Academy of Management Journal*, *Organizational Behavior and Human Decision Processes*, *Journal of Management*, *Organization Science*, and *The Leadership Quarterly*. This manual search resulted in 18 additional articles. Third, we conducted Google Scholar queries for leadership/followership research utilizing methods (“eye-tracking,” “social signaling,” “wearables,” “language style matching,” and “public goods games”) that are not common in the leadership field. This step yielded 10 additional studies. In the fourth step, we browsed the reference lists of review articles on leadership behavior that were identified in the second step to identify additional potentially relevant studies. This resulted in three additional publications being identified. In the final step, we sent out a call for (unpublished) work being

**TABLE 1** Overview and description of behavioral types identified through the literature review and examples of their application in the reviewed articles

Behavioral method (% of included studies)	Description	Application in the reviewed articles	Exemplary references (full list in Supporting Information S2B)
Verbal behavior (74.1%)	Spoken behavior	In the lab: Audio/video stimuli presented to participants and confederates verbalizing specific leader/follower behavior, live observations of leader–follower interactions through one-way mirrors, observations from leader–follower interactions from audio/video recordings In the field: Audio/video recordings of the public media, observations during team meetings	Baxter, 2014; Luria & Berson, 2013; Meinecke & Kauffeld, 2019; Schlamp et al., 2020; Shi et al., 2019; Wasike, 2017; Weiss et al., 2018
Text-based behavior (19.2%)	Written behavior	In the lab: Text-based vignettes that represent concrete behaviors, such as emails, written speeches, etc.; written material produced by participants In the field: Emails, posts on virtual team platforms and online communities, chat logs Note that most of these forms are more likely to be asynchronous.	Carton & Lucas, 2018; Carte et al., 2006; Griffith et al., 2011; Reyt & Wesenfeld, 2015, Study 1; Yoo & Alavi, 2004
Choice behavior (9.8%)	Repeated leaders' (or followers') choice behavior per round of a (economic) game	Only found in lab settings; paradigms included sequential public good games and variants, the dictator game, or other games based on similar principles	Bendahan et al., 2015; Study 2; Brandt & Cooper, 2007; Rivas & Sutter, 2011; Sorrentino & Boutiller, 1975; Weber et al., 2001
Gaze (6%)	Gaze movements, gaze directions, and eye contact	In the lab: Eye-tracking machines recording participants' gaze while watching a screen displaying the target stimulus (e.g., a scene of a leader–follower interaction, a video of the leader/follower[s] with which the participant “interacts,” such as by delivering a speech); gaze patterns are tracked with high-resolution cameras during in vivo leader–follower interactions; human coders note down timing and direction of gaze behavior in dyadic or team settings In the field: Eye contact with employees as one element of a leadership training programs	Beyan et al., 2019; Capozzi et al., 2019; Gerpott et al., 2018; Korsgaard et al., 1998; Study 2; Maran et al., 2019; Tindall et al., 1978
Facial expressions (7.1%)	Orofacial movements and expressions (e.g., smiling, frowning)	In the lab: Observations of participants' facial expressions via rating and coding; manipulations of specific facial expressions via confederates or visual stimuli to express a particular leadership style, mood, or emotions In the field: Facial expression as a concrete element of a charismatic leadership training	Antonakis et al., 2011; Butler & Geis, 1990; Ito et al., 2018; Jiang et al., 2015; Maran et al., 2019, Study 2; Venus et al., 2013
Gestures (6.4%)	Expressive movements with hands and arms	In the lab: Observations of participants' gestures via rating and coding; manipulations of	Antonakis et al., 2011; Boies et al., 2015; Jaussi & Dionne, 2004; Kay

TABLE 1 (Continued)

Behavioral method (% of included studies)	Description	Application in the reviewed articles	Exemplary references (full list in Supporting Information S2B)
		specific gestures via confederates or visual stimuli to express a particular leadership style, dominance, mood, or emotions In the field: Gestures as a concrete element of a charismatic leadership training	& Christophel, 1995; Olsen et al., 2020
Voice tone/pitch (5.6%)	All nonverbal elements of voice	In the lab: Observations of participants' tone of voice via ratings (positive, negative, neutral) and levels of pitch via machine detection; manipulation of voice tone via confederates to express leader/follower emotions and mood and particular leadership styles In the field: Tone of voice as a concrete element of a charismatic leadership training	Antonakis et al., 2011; Beyan et al., 2018; Griffith et al., 2015; Laplante & Ambady, 2002; Lewis, 2000; Stein, 1975; Tee et al., 2013
Movement cues (6.4%)	Body orientation, distance between individuals, posture and position	In the lab: Observations of participants' distance or orientation to each other (via Bluetooth, infrared, accelerometers, and kinematic sensors) and body postures via rating and coding; manipulations of specific movement cues by confederates to express a particular leadership style or follower behavior In the field: Measurements of participants' distance from each other and movement patterns through a particular site (e.g., building); specific body orientations as part of an appraisal training program for employees	Chafin et al., 2017, Studies 3a & 4; Cook et al., 2019; D'Aussilio et al., 2012; Korsgaard et al., 1998; Meyer et al., 2016; Venus et al., 2013
Nonverbal behavior unspecified (14.3%)	Behavior that is labeled as "nonverbal" in the study without further specifying which behaviors are examined (specific nonverbal behaviors are listed above)	In the lab: Imprecise descriptions of confederates' behavior (e.g., "strong vs. weak nonverbal communication," "working slowly"); confederates trained to act consistently with one another without further specifying precise behaviors; rating scales that imply nonverbal components without specifying precise behaviors (e.g., "seeks attention," "paints an interesting picture of the future for the group") In the field: Qualitative observations of unspecified nonverbal behavior (e.g., "comprehensive notes on nonverbal communication," "preparing the operation room"); rating scales that imply nonverbal components without specifying precise behaviors (e.g., "paints an interesting picture of the future for the group")	Andersson et al., 2015; Borg, 1957; Cooper & Wakelam, 1999; Dubno, 1963; Gitter et al., 1975

Note: In many studies, several types of behaviors were investigated. Hence, the cumulative percentages exceed 100%.



prepared for journal submission via the AOM ListServ and directly contacted leadership scholars who had published research involving behavioral variables. This step added three previously unidentified articles. An illustration of this search process is included in Supporting Information S1B.

The final set of papers comprised 243 articles covering 266 empirical studies. Table S2A provides a detailed overview of the identified 266 studies, including information about the methodological approach utilized and the types of behavior investigated, a brief description of the research design, outcome measures, temporal scope, underlying conceptual model, and sample size. A complete reference list for these studies is included in Supporting Information S2B. The first author and three research assistants coded the identified articles by considering the following questions: (1) What is the study context (lab vs. field)? (2) Which methodological approaches were employed to investigate behavior? (3) Which behavioral types were investigated? (4) At which temporal scope were the focal variables analyzed? And (5) what was the underlying conceptual model that describes the studied relations among the focal variables? For completeness, we also noted the outcome measure(s), the sample size, and a brief description of the study set-up. *Methodological approaches* indicate how leader and/or follower behaviors are captured in a study. Specifically, we differentiate between training, manipulation, observations, and critical incidents.<sup>1</sup> By *behavioral types*, we refer to the types of behavior that were studied. Specifically, we distinguish between verbal behavior, text-based behavior, choice behavior, gaze, facial expressions, gestures, voice tone and pitch, movement cues, and unspecified nonverbal behavior (i.e., behavior that is labeled as “nonverbal” in a study without further specification of what precisely is examined). In terms of temporal scope, we considered the five time-theoretical levels introduced above (i.e., nano-, micro-, meso-, macro-, and giga-time).<sup>2</sup>

## 4 | REVIEW FINDINGS

Table 1 presents detailed descriptions of the nine behavioral types identified in this review and offers exemplary insights into how these types have been applied in the reviewed articles.<sup>3</sup> In the following sections, we first discuss the underlying conceptual models and the investigated temporal scopes. We then turn to a comparison of predominant methodological approaches and behavioral types studied in the laboratory and field context.

### 4.1 | Underlying conceptual models of extant behavior-based research

To understand which types of research questions scholars have sought to answer utilizing behavior-based research designs, we aggregated the concrete variables used in every reviewed study and their relationships with each other to a higher (abstract) level. This overview helps to answer the question of how behavior-based research has

studied leadership and followership from perspectives that go beyond what we can investigate with designs that rely exclusively on surveys/self-reports. Table 2 summarizes the underlying 26 generic conceptual models of the studies included in this review and categorizes them into seven broad research questions. Supporting Information S3A offers a detailed explanation of the steps that we took to cluster the variables included in the 266 identified studies into 19 higher-level categories (i.e., the boxes in Table 2, such as leader behavior), which served as the foundation for the 26 generic models and were further analyzed in terms of their respective temporal scopes.

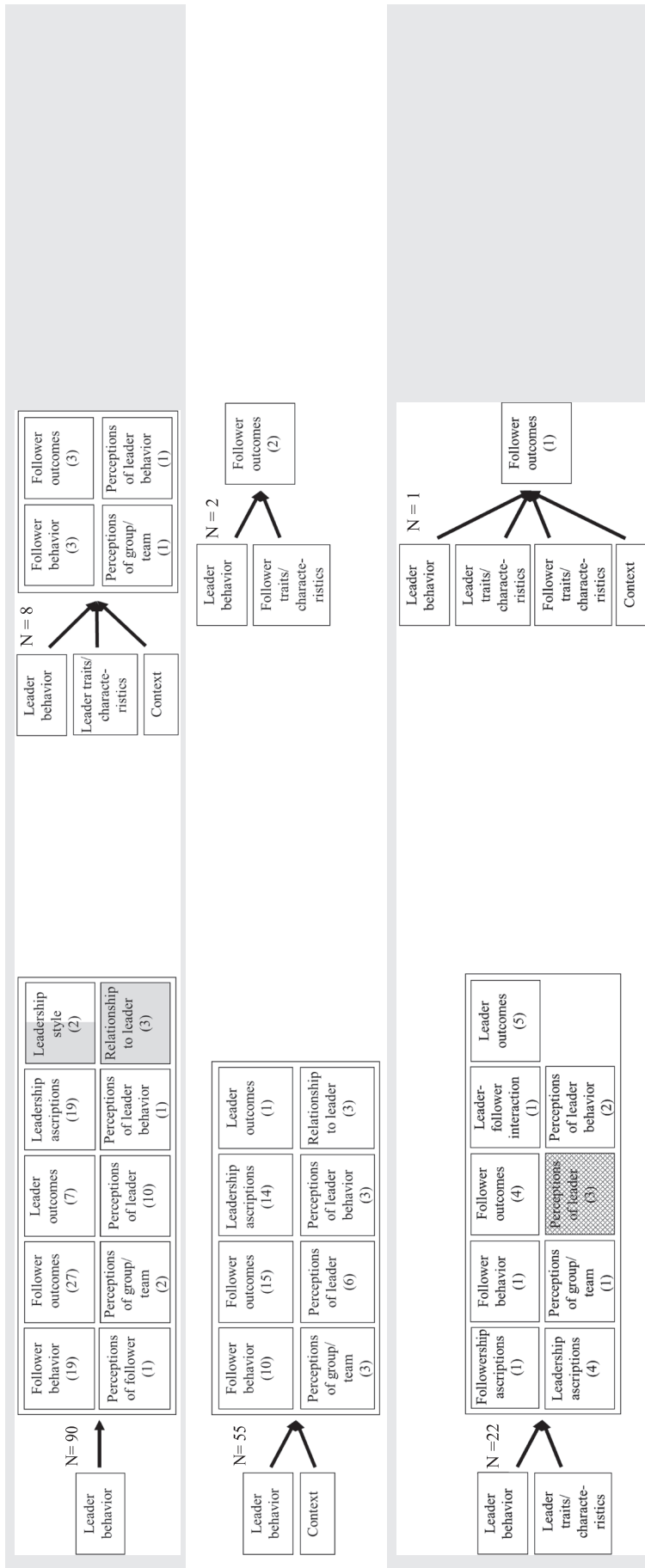
Our classification reveals that scholars preferably aim to answer the question of *how specific leader behaviors relate to a wide range of outcomes*, with the most prevalent being follower outcomes (see Table S3B for a detailed analysis), leadership ascriptions (e.g., emergent leadership, leader prototypicality, leadership rank, and status), and follower behavior (e.g., verbal, nonverbal, gaze patterns, and movements). The predominant temporal level at which scholars have investigated this question is the micro-level. In addition to studying the direct links between leader behavior and the dependent variables (90 studies), it has also become increasingly popular to consider contextual factors (55 studies) or leadership traits/characteristics (22 studies) as additional predictors or boundary conditions of leader behavior. For example, Schlamp et al. (2020) demonstrated that while male and female team members did not differ in their overall task-oriented verbal behavior, they did differ in the degree of leadership that was ascribed to them for displaying these behaviors. What would be interesting here would be to also have round-robin data concerning team members' perceived task-oriented communication to determine whether the task-oriented communication of female team members is simply overlooked (i.e., does not manifest in perceptions, which could explain the lower emergent leadership rating) or is perceived but evaluated differently. This combination—that is, studies collecting both actual and perceived behavior from leaders—is, however, rarely represented in Table 2. Such knowledge would be not only theoretically interesting (e.g., in terms of information processing theory) but also practically relevant, as it could help to answer questions such as whether practitioners would be well advised to train leaders in certain leader behaviors or whether they should focus more about training those who may form (biased) perceptions of the focal leaders' behavior. Against this backdrop, we further elaborate on research designs that combine the “best of both worlds” in the first future research direction (i.e., Section 5.1).

A related prevalent research area concerns the question *whether training specific leader behaviors can positively influence a wide range of outcomes*, with the most prevalent outcomes being perceptions of leader behaviors and leadership style and leader or follower outcomes (see Table S3B for a breakdown of outcomes). These types of studies investigated, for example, whether training programs can promote charismatic leader behaviors (e.g., Antonakis et al., 2011), collaborative and inclusive leadership practices (Leigh et al., 2010), or transformational leadership (e.g., Parry & Sinha, 2005; Tafvelin et al., 2019). In terms of their temporal scope, these studies operated on the giga-time level by comparing a pre-intervention measure with a post-

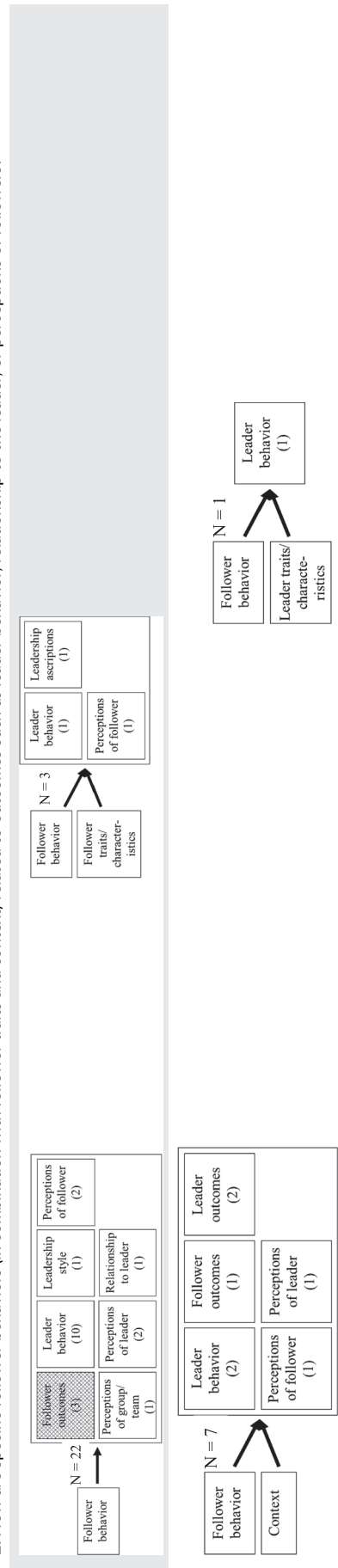


**TABLE 2** Overview of investigated research questions in behavioral leadership studies, generic models, temporal scope, temporal scope (color-coded), and total number of studies per research question

1. How are specific leader behaviors (in combination with leader traits and context) related to outcomes such as follower behavior, perceptions of leaders, or leader outcomes?



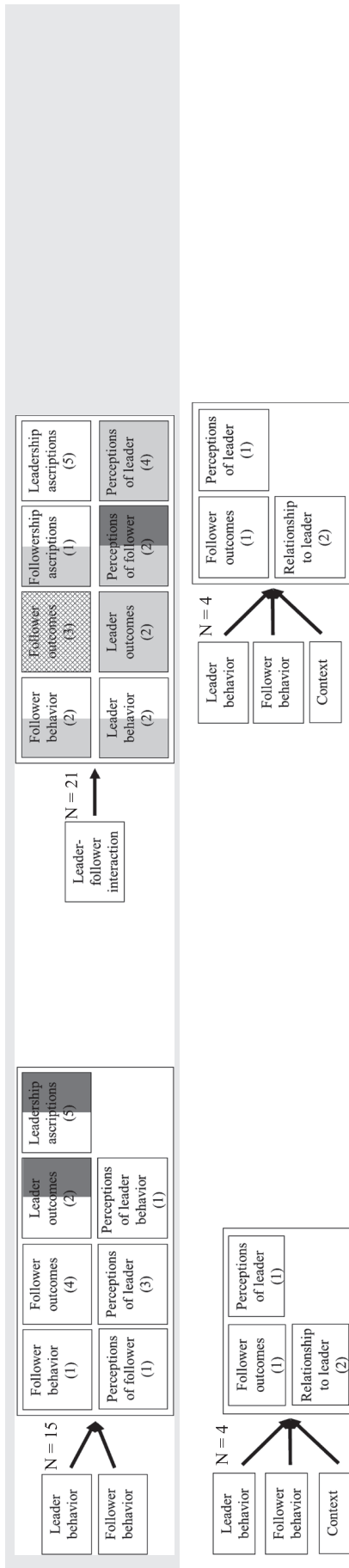
2. How are specific follower behaviors (in combination with follower traits and context) related to outcomes such as leader behavior, relationship to the leader, or perceptions of followers?



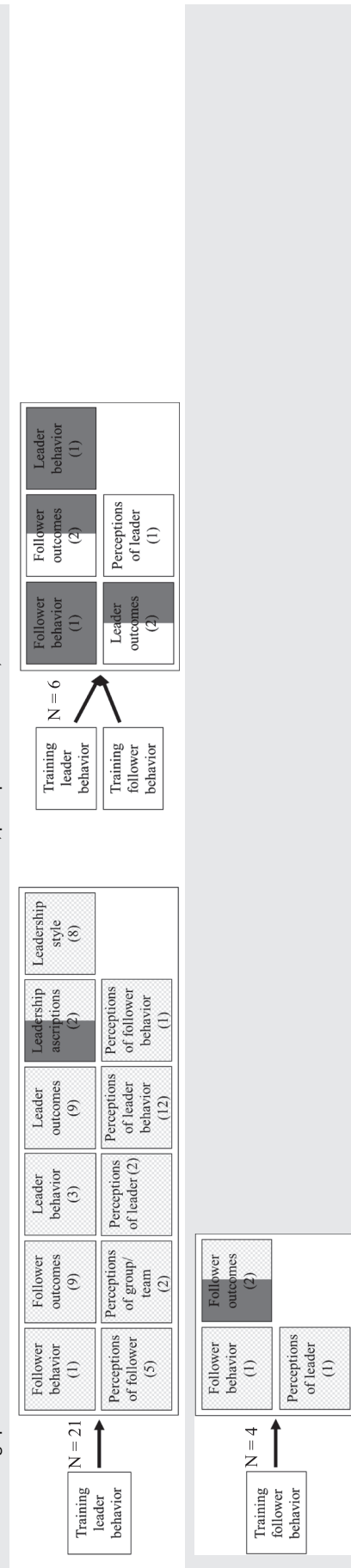
(Continues)

TABLE 2 (Continued)

3. How are specific combinations of leader and follower behavior related to outcomes such as follower outcomes, perceptions of leaders, or leadership ascriptions?



4. Can training specific leader and follower behaviors affect outcomes such as follower behavior, perceptions of leaders, or follower outcomes?



5. How do leader and follower roles (and individuals' traits) affect individuals' behavior?

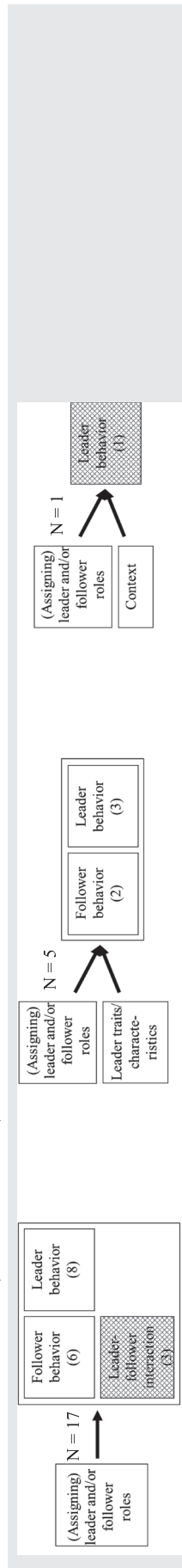
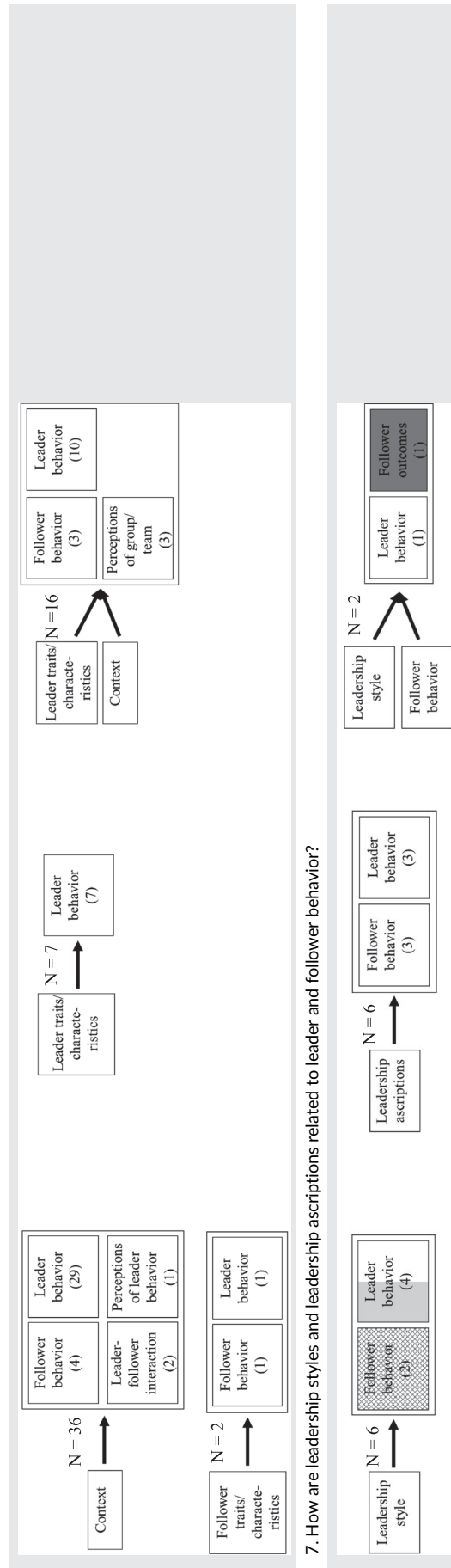


TABLE 2 (Continued)

6. How are context and individuals' traits and other characteristics related to leader and follower behavior?



Note: N describes the total number of studies investigating the depicted generic model. The number of studies per outcome variable is in parentheses. Each outcome variable is colored according to the predominant temporal-level at which that generic model has been investigated (light gray = nano-level; white = micro-level; dark gray = macro-level; white-gray checked = two predominant temporal levels; crisscross = no predominant level). Some studies investigated their research questions at different temporal levels, which is why some outcome variables are marked with two temporal levels.

intervention measure collected a few to several months later. Training studies provide important insights with respect to the effectiveness of particular interventions and—provided that these programs are grounded in theory—may help support or reject hypotheses that link specific leader behaviors to specific follower outcomes. However, due to the prevalent focus on the giga-time level, we know little about what precisely occurs in the months following an intervention. In fact, only a minority of studies explicitly discussed time-theoretical choices (as is true for most of the studies identified in this review); that is, only very few studies explicitly considered time, or the passing of time, as a variable in their design. To enrich an evidence-based perspective on leadership training programs, it may thus be a promising endeavor to more often pose these research questions on different time-theoretical levels (i.e., nano-, micro-, or macro-level) or consider an integration over temporal levels to understand how different temporal levels depend on and affect each other (e.g., a newly learned behavior may help in the short term but become detrimental in the long term). We revisit these ideas when discussing the second future research direction (Section 5.2).

The two predominant research foci (i.e., using leader behavior as a predictor or training leader behavior as an independent variable) reflect a strong focus on the leader as the main driver of outcomes. Reversing the lens, 33 studies considered follower behavior as the driving factor of behavioral or perceptual outcomes measures (see Research Question 2). While likely not surprising against the backdrop of what is published in the leadership field (i.e., studies celebrating the deeds of leaders; see Alvesson, 2020), the analysis of the underlying conceptual models shows that more complex research designs and studies investigating the co-construction of leadership through followers remain rare. Although the conceptual models depicted in the context of the third (i.e., *How are specific combinations of leader and follower behavior related to outcomes?*) and fifth (*How do leader and follower roles [and individuals' traits] affect individuals' behavior?*) research questions point in this direction, extant studies have only rarely zoomed into (nano-level) sequences of leader and follower behavior—a topic that we critically reflect on in the discussion of the third future research direction (Section 5.3).

The two predominant research foci (i.e., using leader behavior as a predictor or training leader behavior as an independent variable) and their corresponding preferred temporal scope (i.e., micro- and giga-time) also reflect the overall preference for temporal scopes. Across all studies included in this review, 65.7% reported data at the micro-level (i.e., evolving over minutes or within an hour), 14% at the giga-level (i.e., evolving over multiple months or years), 8.7% at the macro-level (i.e., evolving over multiple days or a week), 7.2% at the nano-level (i.e., evolving within seconds, microseconds, or frames), and only 0.4% at the meso-level (i.e., evolving over the course of a day). There is a clear general trend for larger temporal scopes in field studies, as is evident in training intervention research which is mainly captured at the giga-level. This entails that the overall preference for testing generic models at the micro-level is considerably driven by the preference for laboratory settings when conducting behavioral research—a topic we turn to next.<sup>4</sup>

## 4.2 | Study context, methodological approaches, and behavioral types

Understanding which types of behaviors have been studied how (i.e., through which methodological approaches) in which study context at which temporal level allows for pinpointing what we know about specific leader and follower behaviors in controlled environments (i.e., the laboratory) as compared to their manifestation “in the wild” (i.e., the field). Figure 1a,b presents visual illustrations of the number of studies identified in the laboratory versus field context and further divides them based on the methodological approaches utilized, behavioral types investigated, and temporal scopes.

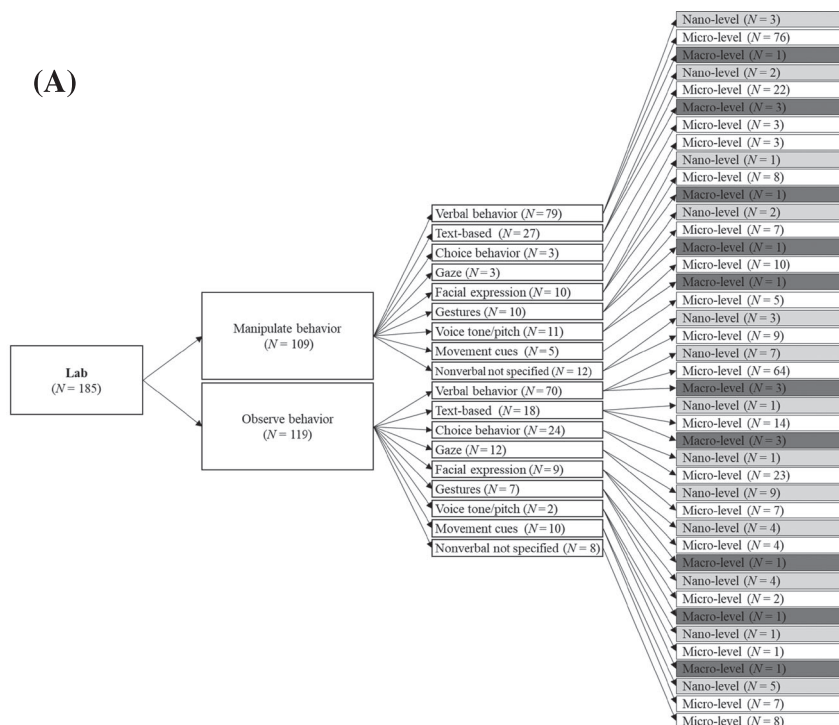
### 4.2.1 | Laboratory study context

Our systematic review reveals that scholars who seek to study actual behavior preferably do so in laboratory contexts (traditional laboratory studies and online experiments). More specifically, of the 266 studies that we identified in total for this review, 185 (69.6%) were conducted in the laboratory, with roughly two thirds of the studies relying on the manipulation of behavior and another two thirds utilizing behavioral observations. In terms of the preferred temporal scope, lab data were collected mainly at the micro-level (87.6% of all lab studies) and nano-level (11.4% of all lab studies). These temporal foci are likely driven by the fact that, realistically, scholars can generally only keep participants in a laboratory for limited periods of time.

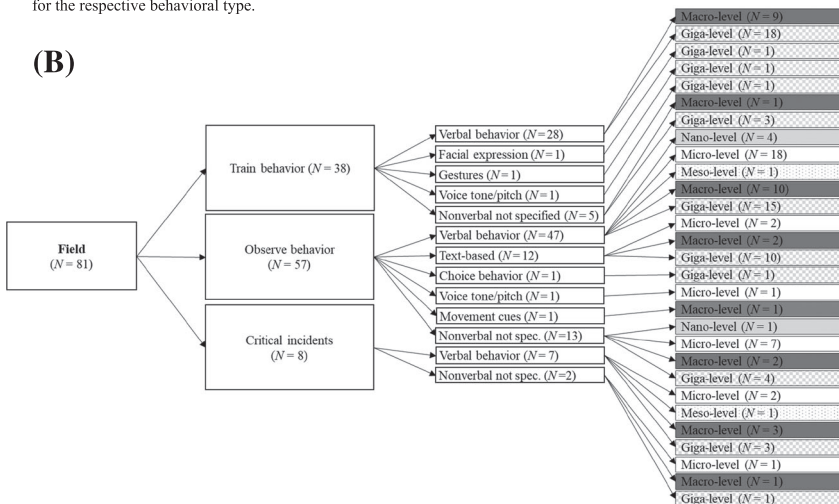
We next turn to the question of which types of behaviors scholars preferably study in the lab. Verbal behavior is the dominant investigated behavioral modality (cf. Figure 1a); it was manipulated in 79 studies (42.7% of all lab studies) and observed in 70 studies (26.3% of all lab studies). As a representative example of the research focus on verbal behavior, Jurma and Wright (1990) conducted an experimental laboratory study in which participants completed a problem-solving task in teams. Confederates played the team leaders and were trained to make helpful, supportive, informative, and assertive utterances (leader gender and power loss vs. gain were also manipulated). The team interaction was audiotaped and coded by independent raters for communication content (task-oriented, instrumental, socio-emotional, and expressive behaviors). The authors then analyzed the effects of leader behavior on team communication.

The second preferred behavioral type is text-based behavior, which was manipulated in 27 studies (14.6% of all lab studies) and observed in 18 studies (9.7% of all lab studies). Likely because written material represents a relatively straightforward way to manipulate specific behavioral components while keeping others constant in a neat way, it is particularly attractive for (online) experiments. A laboratory study by Griffith et al. (2011) that investigated the effects of leader deception serves as a representative example of research including this behavioral type. Participants were assigned an employee role and had to read and respond to a series of emails containing information about the company, their team, their own role, their team members' perspectives on the leader, and emails from the leader

**FIGURE 1** (a) Number of identified studies that manipulated or observed behavior in a laboratory context, further split up into the investigated behavioral types and temporal scopes. (b) Number of identified studies that trained or observed behavior or utilized critical incidents in a field study context, further split up into the investigated behavioral types and temporal scopes



*Note.* Several studies employed more than one methodological approach (e.g., manipulating and observing behavior) and collected data on more than one behavioral type (e.g., verbal and nonverbal behavior), which is why the numbers do not add up to 100%. In addition, many studies investigated different behavioral types with the same methodological approach (e.g., observing verbal behavior, gaze, and gestures) which is why the numbers of behavioral types will not always add up to the numbers for the methodological approach. Similarly, some studies considered the same behavior at two or more temporal levels within one study (e.g., sequences of verbal behavior at the nano-level and overall frequencies of that behavior across a meeting) which is why the numbers for the temporal levels will not always add up to the numbers provided for the respective behavioral type.



*Note.* Several studies employed more than one methodological approach (e.g., training and observing behavior) and collected data on more than one behavioral type (e.g., verbal and nonverbal behavior), which is why the numbers do not add up to 100%.

himself. Emails were written according to one of four conditions to manipulate whether the leader deceived or not and whether he benefited from the deception or not to investigate how the respective behaviors influenced participants' perceived leader-member exchange and organizational commitment.

Although leadership research on nonverbal behavior is still in its infancy, to date, laboratory studies indicate a greater variety of non-verbal behavioral types than field studies, with eye-gazing studies

being particularly popular. Of particular interest for exploring new avenues in leadership research are those laboratory studies that use relatively unconventional tools for data collection, such as Bluetooth and infrared or kinematic sensors. Recognizing that these studies allow asking novel questions related to an embodied understanding of leadership and followership, we consider this an intriguing area for future research, a point to which we return in the future research directions.

It is striking that even though in the laboratory context, nonverbal behaviors were captured in 54 (29.2% of all laboratory studies) studies, this figure still presents a considerable mismatch with the fact that nonverbal behaviors comprise 65% to 93% of human communication (Birdwhistell, 1970). This empirical shortcoming may not necessarily represent an oversight on the part of leadership scholars but may instead also point to a theoretical shortcoming, namely, that existing leadership theories rarely include nonverbal cues. An exception in that regard concerns the (re-)conceptualization of charismatic leadership to explicitly include nonverbal signals such as gestures (Antonakis et al., 2011). Taking this consideration of nonverbal cues one step further, we identified four studies that even explored multimodal interaction patterns (i.e., the simultaneous analysis of several modalities) in controlled laboratory settings. We presume that this constitutes an area that will grow in the future given advancements in machine learning that allow for more easily analyzing complex multimodal data sets (e.g., Lee et al., 2020; Luciano et al., 2018). To contribute to this advancement, we discuss potential avenues for multimodal studies in the future research section.

#### 4.2.2 | Field study context

The majority (70.4%) of the 81 studies conducted in a field context relied on observations of leader and/or follower behavior. In addition, approximately half of these studies used some form of intervention design to train a behavior of interest. Eight studies also relied on critical incidents. In terms of the preferred temporal scope, field data were collected mainly at the giga-level (71.6%; i.e., covering a timeframe of multiple months or even years). Just as in the laboratory context, verbal behavior constituted the predominantly studied type of behavior in field studies. Specifically, verbal behavior was targeted in the majority of studies that trained leader/follower behavior (28 of 38 studies in total), observed in 57 studies, and captured in seven studies utilizing critical incidents. An illustration of a field study investigating verbal behavior is that by Chan and Du-Babcock (2018), who recorded two meetings of different teams with formal leaders and examined these data with a micro-analytic approach (i.e., conversation analysis) to explore how leadership was constructed during the meetings via turn allocation, agenda management, and task assignment.

The second most frequently investigated behavioral type was unspecified nonverbal behavior. This code was assigned to studies that clearly incorporated nonverbal behavior but did not further specify which precise behaviors were targeted. Skarlicki and Latham (1997), for instance, conducted a semi-experimental field study with two groups of shop stewards. One group received leader training, while the other served as the control group. The authors were interested in studying whether training leaders on organizational justice principles would positively impact union members' organizational commitment and their fairness perceptions of the leaders. In their manuscript, the authors wrote that the training included lectures, case studies, role-playing exercises, and group discussions; however, they did not provide further details in terms of concrete behaviors. It goes without

saying that such descriptions pose difficulties when designing replication studies and fostering the development of theory, as the focus constructs are only vaguely defined and the insights provided in the study can hardly be compared with those offered in other behavioral research studies. Against the backdrop of the rising open science movement (Tenney et al., 2021), we hope that this state of affairs will change in the future.

Interestingly, only 14 studies analyzed text-based communication. This is somewhat surprising given that emails and asynchronous communication (e.g., via virtual team spaces such as MS Teams, Slack, or Webex) have become increasingly popular and offer large amounts of data that scholars could easily leverage to test and develop theory on leadership communication (Kobayashi et al., 2018; Short et al., 2018).

Lastly, it is striking that we were only able to identify a few studies conducted in the field that explicitly investigated the occurrence of the influence of a specific nonverbal behavior in the leadership process. For example, despite its popularity in the lab, no study has investigated gaze in the field. The lack of attention to this topic can partly be explained with reference to the need for specific devices to capture eye gaze or for a constant environment, which is only offered by lab settings. However, recent technological advancements may facilitate investigations focused on eye gaze patterns in the field—a topic that we discuss in more detail in the future research section on unconventional methods for data collection.

To conclude, our joint analysis of study context, methodological approaches, and behavioral types in extant research indicates a clear preference for laboratory studies or online experiments over field studies to establish the causal influence of manipulated behavior. The leadership field needs to invest more efforts into collecting field data to explore new phenomena relating to leadership and followership (Antonakis, 2017) and to understand these phenomena in their full situated context. We return to this point in our discussion of future research directions.

## 5 | FUTURE RESEARCH DIRECTIONS

When asked to describe the “typical behavior-focused study on leadership and followership” on the basis of the above review, the answer would be that it is likely a laboratory study in which the authors manipulated verbal behavior of a leader (i.e., confederate or assigned role) to investigate how followers react, which outcomes are triggered, or how leadership ascriptions are influenced. Alternatively, it may be a field study in which managers participate in a leadership development intervention (i.e., training leader behavior) to allow the authors to examine (perceived) leader behavior changes or follower outcomes (e.g., commitment and satisfaction with the leader). Although such study designs can answer interesting research questions, our closer inspection of underlying conceptual models, investigated temporal scopes, different behavioral types, and methodological approaches revealed that the leadership field—at least in theory—has significant untapped potential to provide insights into the complex interplay of leadership and followership. Based on the insights offered



by our review, we next identify and discuss six understudied research areas. For each of these areas, we first summarize the shortcomings of existing work and then elaborate on potential solutions and future avenues. We also provide a short summary of starting points and open questions for each future research area in Table 3.

## 5.1 | Developing theories and collecting data that connect actual and perceived leader and follower behavior

### 5.1.1 | Shortcomings

Behavioral measures are no silver bullet, and perceptions should still be considered. Individuals act upon their perceptions of others' behavior. Accordingly, understanding how a leader/follower perceives their counterpart's behavior and subsequently acts upon it would help to disentangle the complex mutual influence of perceptions and behavior (Gerpott et al., 2020). For example, perceptions of a person's behavior may not necessarily be congruent with the behavior they objectively exhibit or may not be equally shared among interaction partners (e.g., when different followers perceive a leader's behavior differently). Hence, research should combine behavioral measures with self- (and other-)reports to understand how and when behaviors and perceptions align and how such a (mis)alignment is related to the outcomes of interactions between leaders and followers. However, only a few studies have considered actual and perceived leader and follower behaviors (see Table 3). Accordingly, we consider conciliating the respective positions of advocates of a behavioral approach (i.e., "We don't want a science of self-reports and finger movements!"; see Baumeister et al., 2007) and supporters of survey research (i.e., "The world is socially constructed—only perceptions matter!") as one of the most promising avenues for advancing theory and practical insights into leadership and followership.

### 5.1.2 | Future avenues

First, to study how leaders and followers' actual behavior is perceived by the respective other party over specific time periods, new approaches to data collection will need to be developed. The notion of "high-resolution" research designs (e.g., Klonek et al., 2019) from the team dynamics literature can provide some inspiration. The idea behind such designs is to collect multiple measurement points via high sampling rates to be able to "map out" behavioral interactions (Schechter et al., 2018), potentially by utilizing machine learning approaches (for inspiration, see Hung et al., 2011; Jayagopi et al., 2009, or Beyan et al., 2018, 2019). However, depending on the temporal scope of a study, repeatedly asking participants to share their perceptions of behaviors that others (or themselves) have just engaged in may prove quite distracting. In that regard, a study in the field of cognitive psychology conducted by Spiers and Maguire (2008) suggests an alternative approach. The authors invited London taxi

drivers into their lab to complete a navigation task in a virtual reality simulation of London. Thereafter, the participants watched a "recording" of their route through the simulation and had to describe what they had been during each stage of the trip. Verbal reports were matched with eye-gaze data obtained during task completion, which illuminated the cognitive patterns involved in wayfinding. Similarly, leaders and followers could be filmed during an interaction (i.e., an appraisal interview) and subsequently review the filmed interview on a step-by-step basis to report their thoughts (cf. Elsbach & Kramer, 2003). Such techniques can reveal the processes underlying how behavior is interpreted and then reacted to, thereby providing insights into the complex interplay of perceptions and behavior in the establishment of leadership and followership.

Second, in terms of concrete research questions, the fact that individuals interpret behaviors differently remains an unresolved puzzle. As such, it would be interesting to identify drivers of congruent versus divergent leadership perceptions, that is, under which conditions followers interpret a leader's actual behaviors in the same or different ways. Furthermore, future work could examine when these (un)shared perceptions remain constant over time or under which circumstances they fluctuate (i.e., identifying contextual factors that facilitate convergent vs. divergent leadership perceptions). For example, recent work in social psychology has identified conditions under which implicit first impressions can be updated (Ferguson et al., 2019). From a practical perspective, it would be interesting to explore how leaders can manage different levels of shared leadership perceptions on the part of their followers to ensure high performance.

Third, examining the relationship between specific behaviors and their effects on perceptions at each of the different temporal scopes would represent a step toward understanding the complex interplay between perceptions and behavior in the context of leadership and followership. For instance, a brief interaction at the nano- or micro-level may likely affect interactants' mutual perceptions in that very moment and thereby influence how the interaction unfolds. However, the impact of that interaction on general or long-term impression formation (i.e., giga-level) would probably be very limited. Future research could thus explore how repeated patterns in leader and follower behavior at lower temporal levels affect perceptions at higher temporal levels (e.g., investigating whether interactions in critical moments are more influential). Inversely, scholars could investigate how long-term perceptions at the giga-level affect the interpretation of interactions at lower temporal levels. This suggestion brings us directly to the next overlooked area, namely, analyzing behavioral data over time and across more than one temporal level.

## 5.2 | Data analysis over time and over more than one temporal level

### 5.2.1 | Shortcomings

Our classification of temporal scopes in Table S2A relies on the level of *analysis*. However, the time-theoretical levels could also be applied

TABLE 3 Understudied research questions utilizing behavioral data

Topic	Starting points/initial evidence	Open questions
Developing theories and collecting data that connect actual and perceived leader and follower behavior	<ul style="list-style-type: none"> <li>• Perceived leadership style predicted team communication (i.e., follower behavior) mediated via the leader's communication behavior (Lehmann-Willenbrock et al., 2015)</li> <li>• Leader ratings via the <i>leader behavior description questionnaire</i> were more sensitive to leader performance cue manipulations than a more behaviorally oriented scale (Gioia &amp; Sims, 1986)</li> <li>• After laboratory interactions with their followers, leaders' self-reported ratings on <i>leader behavior description questionnaire</i> and respective ratings of independent judges correlated highly, <math>r = .72; p &lt; .001</math> (Green et al., 1976)</li> </ul>	<ul style="list-style-type: none"> <li>• What are drivers of congruent vs. divergent leadership perceptions in followers as they interpret their leader's actual behavior?</li> <li>• Do (un)shared perceptions remain constant or fluctuate over time?</li> <li>• Which contextual factors facilitate convergent vs. divergent leadership perceptions?</li> <li>• How can leaders manage different levels of shared leadership perception on the part of their followers to ensure high performance?</li> <li>• How do behavior and perceptions interplay at each temporal level?</li> <li>• How do interactions at lower temporal levels affect perceptions at higher temporal levels (and vice versa)?</li> </ul>
Data analysis over time and over more than one temporal level	<ul style="list-style-type: none"> <li>• Most evidence on leader–follower interaction has been analyzed at the micro-level</li> <li>• For analysis, data are typically aggregated across the period of interaction, resulting in the loss of information on behavioral trajectories over that period of interaction</li> <li>• Various data collection techniques exist and are already employed to collect data at very small temporal scopes (i.e., nano-level), theoretically allowing for more fine-grained analysis to model behavioral trajectories</li> </ul>	<ul style="list-style-type: none"> <li>• What are the patterns of leader and follower behavior as they unfold over time at the different temporal scopes?</li> <li>• How do behavioral patterns at each of the temporal levels depend on and affect each other?</li> <li>• Does the effect of the predictor on the outcome vary at different temporal levels?</li> <li>• Are there moderation effects over temporal levels?</li> </ul>
Analyzing interdependent behavioral patterns between leaders and followers	<ul style="list-style-type: none"> <li>• Most studies in this review focused on unidirectional relationships</li> <li>• Two studies analyzed verbal mimicry, a form of interdependent leader–follower interaction, and showed how this phenomenon affects follower outcomes and perceptions of the overall interaction (Meinecke &amp; Kauffeld, 2019; Shi et al., 2019)</li> <li>• One study analyzed leader–follower and follower–leader sequences (managers' organizational behavior and subordinates' attribution statements) and descriptively discussed interdependencies</li> <li>• Four publications focused on bidirectional behavioral patterns (leader–follower and follower–leader sequences) and showed how within the same contexts, both interactions partners can influence each other (Herold, 1977; Meinecke et al., 2017; Yukl et al., 1993) and how specific sequences of leader–follower interactions influence how the interactants are perceived by observers (Marchiondo et al., 2015)</li> </ul>	<ul style="list-style-type: none"> <li>• What are characteristic patterns of this interdependency at each of the different temporal scopes?</li> <li>• How do context variables affect the strength of the interdependency of behavioral patterns of leaders and followers?</li> <li>• How are the time-dependent changes in leader behavior developed by McClean et al. (2019) related to the interdependency of leader–follower interactions?</li> <li>• How can leadership theories explain these relationships?</li> </ul>
Unconventional methods for data collection-	<ul style="list-style-type: none"> <li>• Eye-tracking has been employed to detect gaze patterns in teams that predict emergent leadership (Beyan</li> </ul>	<ul style="list-style-type: none"> <li>• How can the wealth of data collected by these methods be analyzed sensibly?</li> </ul>

TABLE 3 (Continued)

Topic	Starting points/initial evidence	Open questions
Developing theories and analyzing multimodal interaction patterns	<p>et al., 2018; Beyan et al., 2019; Capozzi et al., 2019; Gerpott et al., 2019; Sanchez-Cortes et al., 2013), between leaders and followers that plays a role in coordinating musical work (Kawase, 2014), and of leaders looking at their followers that predict leaders' self-reported charisma (Maran et al., 2019)</p> <ul style="list-style-type: none"> <li>• Bluetooth and infrared sensors to detect body orientation and distance measurements (Chaffin et al., 2017; Cook et al., 2019)</li> <li>• Kinematic sensors to detect dependencies of movements such as interaction strength or mimicry (D'Ausilio et al., 2012; Meyer et al., 2016)</li> </ul> <ul style="list-style-type: none"> <li>• Different behavioral modalities in leader feedback affected follower productivity and general work satisfaction (Laplante &amp; Ambady, 2002)</li> <li>• Different behavioral modalities affected participants' leadership perceptions differently (Gitter et al., 1975, 1976; Stein, 1975)</li> <li>• Research in social signaling analyzed multimodal interaction patterns in teams to predict emergent leadership (Beyan et al., 2018, 2019; Capozzi et al., 2019; Sanchez-Cortes et al., 2013)</li> </ul>	<ul style="list-style-type: none"> <li>• Self-report data are occasionally used to validate new and unconventional methods. How can this source of bias be reduced?</li> </ul> <ul style="list-style-type: none"> <li>• How do different modalities affect each other in leader–follower interaction?</li> <li>• How can leadership theory building incorporate multimodal behavioral elements?</li> <li>• Do some behavioral modalities have more impact on leadership and followership than others?</li> <li>• Are some behavioral modalities more important for leadership and followership at specific stages of an interaction?</li> </ul>
Naturalistic versus laboratory studies	<ul style="list-style-type: none"> <li>• The majority of research on leader–follower interactions has been conducted in laboratory settings</li> <li>• Laboratory experiments allow causal inferences of specific isolated leader behavior (e.g., consideration and initiating structure, feedback, transactional leadership, charismatic leadership and displaying emotions) or follower behavior (e.g., being supportive, having voice, being assertive)</li> <li>• Lab experiments are a suitable tool for testing the internal validity of theories</li> <li>• The external validity of lab studies is often limited, and an overemphasis on manipulating behaviors in the lab bears the risk of hampering inductive or abductive theory building</li> </ul>	<p>To avoid limiting investigation of the open questions above to laboratory settings and encourage researchers to go into the field and beyond leader interventions studies, they may consider the following propositions:</p> <ul style="list-style-type: none"> <li>• Leverage “real-job” situations, such as high-fidelity simulation trainings in health care teams, that are less sensitive in terms of ethical considerations and in terms of potentially exposing participants' weaknesses compared to “real-job” settings and therefore may induce greater feelings of safety among participating leaders and employees.</li> <li>• Identify working contexts that are naturally more prone to observation, such as sport, music, or online contexts</li> <li>• Employ unconventional data collection tools that may pique participants' curiosity and lower resistance to participation</li> <li>• Identify unique opportunities to access field data (e.g., access to an organization's email communications following jurisdictional investigations)</li> <li>• Leverage exogenous shocks such as the consequences for work settings due to the COVID-19 crisis to gather field data</li> </ul>

to describe the level(s) at which raw data are collected. In the following, we discuss the relationship between a study's level of data collection (i.e., the smallest possible temporal scope at which the data of that study could at least theoretically be analyzed) and the actual level of analysis (i.e., the temporal scope at which the data of that study are actually analyzed) and the challenges we have identified through our review.

We identify three main challenges. First, many studies included in our review gathered data at the smallest temporal scope (i.e., nano-time) at high frequencies and, for their analyses, aggregated their data over the entire period of interest (e.g., micro- or macro-time). To illustrate, Gerpott et al. (2019) coded sense units of verbal behaviors (i.e., nano-time) in self-managed teams but, for the analysis, aggregated all verbal behaviors occurring over the course of a meeting (i.e., micro-time) to predict emergent leadership. Albeit interesting, this design cannot answer the question of whether the timing of specific verbal behaviors within a meeting also matters with regard to being ascribed leadership. To provide another example, Chaffin et al. (2017, Study 4) investigated employees of a particular department of an organization over the course of 2 weeks. Participants were provided with wearables that emitted and detected Bluetooth signals at 30-s intervals to identify the co-locations of participants (i.e., data collection at the nano-level). The data were used to establish overall patterns of co-location, which in turn served as indicators of leader behavior over a period of 2 weeks (i.e., analysis at the macro-level aggregation). While such analytical choices can yield intriguing findings, they limit the ability to make progress in terms of modeling different patterns (shift, growth and decay, ebb, and flow) of leader and follower behaviors over time (McClellan et al., 2019).

The second challenge concerns the lack of temporal integration. Realistically, leadership occurs at all five temporal levels "in the wild" (i.e., leaders acting in their full situated contexts). Focusing on one temporal level is a first step toward better understanding individual elements of leadership and followership and how they may unfold in the selected temporal scope. A further important step, however, constitutes integrating several temporal levels to understand how these levels depend on and affect each other. Shi et al. (2019) provide a best practice example of a temporal integration over several temporal levels. The authors combined a micro-level aggregation (of data collected at the nano-level) with a giga-level analysis. The authors analyzed the language styles (i.e., the use of particular function words; nano-level data collection) of CFOs and CEOs in the Q&A sections of conference calls (i.e., micro-level aggregation for the data analysis). Shi et al. assumed that due to the CEOs higher level of power, their language style would remain relatively constant over time, while CFOs' language style would adjust to that of the CEOs over time. Over a period of approximately 13 months (i.e., giga-level analysis), the authors found support for their hypotheses and could show that increasing levels of language style matching over time (i.e., ingratiation attempts on the part of CFOs) paid off in terms of higher compensations as well as an increased likelihood of CFOs becoming board members of their respective firms.

As a third challenge, only a minority of studies identified in our review *explicitly* discussed time-theoretical choices. That is, only very few studies explicitly considered time, or the passing of time, as a variable in their design (Beyan et al., 2019; Gerpott et al., 2019; Gioia & Sims, 1986; Güntner et al., 2020; Komaki & Citera, 1990; Lehmann-Willenbrock et al., 2015; Meinecke et al., 2017; Meinecke & Kauffeld, 2019; Parry & Sinha, 2005; Romanowska et al., 2013; Shi et al., 2019). The focus of extant studies on analyzing direct relationships and linear positive or negative trajectories of behaviors at the micro-time level means that such studies have not exploited the full potential of behavioral research methods to test, for example, patterns of growth and decay or ebb and flow over longer timeframes (see McClellan et al., 2019, for more complex patterns of development). Greater awareness and explicit consideration of the temporal level at which research questions are targeted could help to localize relevant behaviors and behavioral patterns within specific temporal levels and over more than one temporal level (e.g., which giga-level patterns affect leader–follower interactions at the micro-level?).

## 5.2.2 | Future avenues

The first and most obvious avenue for future research would be to focus less on aggregating data collected at a lower temporal level and more on testing the degree to which certain behaviors are exhibited and patterns of leader and follower interaction over time (McClellan et al., 2019). Our review identified five quantitative studies that employed lag sequential analyses to investigate specific (unidirectional) sequences of leader–follower or follower–leader behavior (Gioia & Sims, 1986; Güntner et al., 2020; Komaki & Citera, 1990; Lehmann-Willenbrock et al., 2015; Meinecke et al., 2017). Lag sequential analysis, an approach that was developed in communication sciences, tests whether specific sequences of behavior occur at a frequency that is above (or below) of what could be expected by chance (Quera, 2018). For instance, Lehmann-Willenbrock et al. (2015) used lag sequential analysis to show that leaders' solution-oriented statements trigger subsequent solution-oriented statements on the part of their team members and inhibit counterproductive member behaviors.

Our review points to many (missed) opportunities for exploring such leader–follower interactions because many studies included in this review already collected time-stamped data (i.e., data that would allow analyses over time). While the extant studies did not fully leverage this type of data, some authors could still explore their existing data sets using lag sequential analysis or other data analytical approaches to model trajectories over time that capture temporally embedded leader–follower phenomena (e.g., Cropanzano et al., 2017). In other words, scholars could return to their original data and re-analyze them on a lower temporal level with a focus on the unfolding of leadership and followership over time. Opportunities to do so exist whenever researchers have access to video- or audio-recorded leader–follower interactions (e.g., Burke, 1974; Maclaren et al., 2020; Papworth et al., 2009; Roberts et al., 2014; Weiss et al., 2017) or

other data with time stamps, such as (written) online communication—for example, individual messages or posts (e.g., Charlier et al., 2016; Fan et al., 2014; Sosik, 1997; Yoo & Alavi, 2004).

A second avenue for future research would be integrating more than one temporal level. As described earlier in this section, future research could address whether the effect of a predictor on the outcome varies depending on the temporal level and how these relationships affect each other via moderation effects across two or more temporal levels. For example, imagine a leader displaying solution-orientation behaviors at the micro-level (i.e., in one meeting), which may have a positive effect on the outcomes of that specific meeting. If this leader were to focus too strongly on solutions for several months, however, this might result in a lack of problem orientation, which could result in important shortcomings in a project being overlooked. As this example illustrates, while a behavior may have positive results at the nano-level, it may result in problematic patterns at the macro- or giga-level. Similarly, patterns at higher levels (e.g., a trustful working climate) may trickle down to lower level interactions and affect their dynamics. Insights into such differences at different temporal levels would be particularly important with regard to the practical implications that could be derived from the research.

### 5.3 | Analyzing interdependent behavioral patterns between leaders and followers

#### 5.3.1 | Shortcomings

Our definition of leadership as a temporal process or a sequence of discrete behaviors that evolves through interactions between leaders and followers over time emphasizes the dynamic nature of the phenomenon. *Dynamic leader-follower interactions* describe interaction patterns between a leader and their follower(s) that include more than one action-reaction pattern (e.g., not just a leader who is saying/doing something and a follower who reacts to this by saying/doing something in turn). That is, dynamic leader-follower interactions are best described as back-and-forth sequences of behaviors. Very few studies in our review aimed to account for the interdependent nature of the interaction patterns between leaders and followers. That is, studies thus far have mostly considered leader and follower behaviors as separate predictors or outcomes (see Table 2). For example, previous work on leader-follower interactions in medical teams has investigated immediate leader reactions in response to followers' voice behavior (Krenz et al., 2019) or studied how leadership training programs to strengthen supervisor support affect followers' organizational commitment, engagement, job satisfaction, and turnover intentions (Ode-Dusseau et al., 2015). Although these results are intriguing, understanding leadership as an interactive process that occurs between leaders and followers requires scholars to move beyond unidirectional approaches and toward bidirectional processes of claiming and granting leadership and followership (cf. DeRue & Ashford, 2010). Hence, there is a pronounced lack of research insights into the back and forth between leaders and followers that could

allow us to understand how reciprocal leader-follower relationships unfold over time.

#### 5.3.2 | Future avenues

A few best practice examples in our review can serve as an inspiration to move further in the direction of interdependent leader-follower interactions. First, two publications applied automated linguistic analysis to investigate language style matching or verbal mimicry between leaders and followers (i.e., the degree of similarity between leaders and followers' patterns of function word usage; Meinecke & Kauffeld, 2019; Shi et al., 2019). While language style analysis does not allow conclusions regarding precise interdependent behavioral sequences (e.g., leader → follower → leader), it enables scholars to establish how leader and follower behaviors converge or diverge over time. Notably, compared to human coding approaches, this method requires relatively little investment and effort (as the analysis can be run automatically on transcribed verbal interactions; for an overview of applications, see Shaw et al., 2019).

Second, a study by Gioia and Sims (1986) illustrates the potential of combining quantitative and qualitative methods for understanding behavioral leader-follower and follower-leader interdependencies. In their lab, the researchers simulated an appraisal interview with experienced managers and MBA students as subordinates. The participants' verbal interactions were coded and analyzed to explore how different types of manager behavior (e.g., task information statement and request, and task opinion statement) elicited attribution statements on the part of subordinates (e.g., attribution request and attribution statement) and vice versa. The authors discuss (but do not further analyze quantitatively) how these sequences are related interdependently and form a chain consisting of manager statements—employee attribution statements—manager statements. This work illustrates how an understanding of interdependence can offer additional insights regarding the interpretation of behavioral sequences.

Moreover, four publications included in this review (Herold, 1977; Marchiondo et al., 2015; Meinecke et al., 2017; Yukl et al., 1993) examined bidirectional leader-follower patterns but did not account for interdependencies. For example, in their qualitative study, Yukl et al. (1993) asked leaders and followers to share critical incidents in which they enacted or reacted to social influence. Leaders and followers provided information on the directionality of influence (upward, downward, and lateral) and described influence strategies. The authors found that different influence strategies were used depending on the timing of the event (initial influence attempt vs. follow-up). These studies clearly illustrate how leader behavior influences follower behavior and vice versa, both in the field and in the laboratory. Future research should attempt to establish interdependent patterns in such sequences more rigorously.

In terms of analytical options for identifying such interdependent behavioral patterns between leaders and followers, we refer the interested reader to Lehmann-Willenbrock and Allen (2018), who summarized different methods (e.g., pattern analysis, statistical discourse

analysis, and visualization-based methods such as state space grids) that allow for the modeling of temporal interaction dynamics in organizational settings. Furthermore, latent growth curve models (Preacher et al., 2008), cross-lagged panel analysis (Oud, 2002), as well as dynamical correlations and actor-partner interdependence models for dyadic leader-follower interaction data (Hofmans et al., 2018) represent suitable options. These analytical approaches require a researcher to consider the time level when designing a study such that behavioral data can be sampled (and potentially aggregated) at intervals and over time periods that are appropriate for the research question or leadership phenomenon of interest.

## 5.4 | Unconventional methods for data collection

### 5.4.1 | Shortcomings

A point that drew our attention is that a large part of the reviewed research base focused on verbal behavior. Typically, such data are collected via live observations or video recordings, and specific verbal acts are coded according to a pre-selected coding scheme. While this focus is in line with the fact that leader behavior is often conceptualized as verbal behavior (e.g., Behrendt et al., 2017; Fairhurst & Connaughton, 2014; Morgeson et al., 2010; Yukl, 2012), other types of (nonverbal) behaviors are essential for leader-follower relationships (Schyns & Mohr, 2004). One reason for the predominant research focus on verbal behavior could be the strong emphasis on verbal behaviors in leadership theory. Another reason that could explain the underrepresentation of different types of nonverbal behavior in leadership and followership research is that the convention of building on established and validated data collection methods may prevent scholars from exploring tools and technologies that are already in use in other disciplines or entirely new. This is because learning about new tools and subsequently acquiring the skills and knowledge required to use and validate them typically require considerable time and effort. Furthermore, possible skepticism on the part of reviewers may discourage researchers from exploring new methods.

However, unconventional methods (i.e., those that are not the standard in the leadership field) have the potential to innovate leadership research by allowing researchers to explore leader and follower behaviors that have seldom been considered. The rise of these methods may also push scholars to think more rigorously about the concrete behaviors that are central to their research questions. Thus, the use of unconventional methods may represent a valuable strategy for inspiring the development of theory. Social signaling, a relatively novel area of study in computer science, offers a wealth of unconventional methods for discovering new insights regarding leader-follower interaction patterns. Social signals in leader-follower interactions include vocal behavior, gaze, vocal behavior, and interpersonal distance movement cues (Vinciarelli et al., 2009). Therefore, we would like to highlight those studies that employed unconventional methods for collecting different types of nonverbal behavior (i.e., social signals).

### 5.4.2 | Future avenues

Among unconventional methods, eye-tracking seems to be particularly promising for future behavioral leader-follower research. Recording gaze movements or gaze directions via eye-trackers or cameras allows for the objective and explicit collection of a nonverbal behavior that represents an important cue in social interactions and a measure of social attention (Grossmann, 2017). From our review, we conclude that eye-trackers have been used in quite different ways. Maran et al. (2019) investigated whether self-reported charisma was related to participants' (i.e., leaders') gaze behavior toward their followers. Kawase (2014) examined how leaders and followers use eye contact to coordinate their work in pianist duos which represent the core function of leadership as a means to solve coordination problems. Other researchers have studied how visual attention (e.g., being looked at while speaking) determines emergent leadership in the interaction of zero-history teams (Beyan et al., 2018, 2019; Capozzi et al., 2019; Sanchez-Cortes et al., 2013). However, these prior studies are largely correlational, which reduces the possibilities for drawing causal inferences (i.e., do gazes from others increase leadership ascription, or does a leader attract more gazes?) and does not allow for the exclusion of unobserved variables (e.g., speech volume) that may drive the effect. Future researchers would thus be well advised to consider more experimental work that manipulates visual attention.

A further limitation of eye-tracking is that it requires a very controlled environment and is difficult to implement in day-to-day interactions. Thus far, this method has proven challenging to implement in the field, as illustrated by the fact that the studies reviewed here were predominantly conducted in the laboratory context. Field data on the gaze behaviors of all interaction partners in dyadic and group settings obtained via mobile eye-trackers could provide more insights into evolving gaze patterns associated with leadership and followership. Moving research out of laboratory settings, leaders and followers would no longer be dependent on eye-trackers connected to screens and computers but could walk around freely in the natural environment wearing eye-tracking glasses and small processing units. Two trends that are specifically relevant to field research are worth discussing here. First, eye-tracking glasses are becoming increasingly compact and starting to more closely resemble normal corrective glasses. These developments should make the circumstances in which interactive research is conducted more natural because people will no longer need to wear futuristic equipment on their heads. Second, eye tracking no longer has to rely on specialized infrared cameras (i.e., eye-tracking devices) connected to computer screens. Instead, due to the advances in AI technology, such tracking can now be done with laptop cameras. This means that eye tracking is easily accessible during, for example, video calls, and can be employed in remote settings (at the home/office of the participating leader/follower). A study in the field of experimental and applied psychology, for instance, used head-mounted mobile eye-trackers to study attentional processes involved in the esthetic experience of adults and children looking at paintings in the Vincent van Gogh Museum (Walker et al., 2017). Finally, while the motives behind eye movement can be theoretically



derived, empirically, they remain a black box (e.g., longer looking time spent gazing may reflect a wide range of motives). On the positive side, several theoretical approaches involve gaze (social attention theory; Emery, 2000; Klein et al., 2009; visual focus of attention theory; Subramanian et al., 2010; signaling theory; Maynard-Smith & Harper, 2003), which could facilitate the integration of gaze cues into leadership and followership theories.

Another set of unconventional methods concerns Bluetooth and infrared technology, which can be used to detect interpersonal distance between individuals. Infrared sensors can only detect distances within a relatively limited range (1.5 m; Chaffin et al., 2017) but are useful for determining whether individuals are oriented toward each other or not. Cook et al. (2019) conducted a laboratory study to examine whether the level of face-to-face contact during a bridge-building task moderated changes in leadership perception before and after this interaction. Two further interesting research areas for this method would be LMX and transformational leadership. For example, scholars could investigate how the level of average interpersonal distance impacts the relationship quality or trust between leaders and followers. One may expect an inverted U-curve where extreme levels of high and low interpersonal distance negatively impact these constructs, whereas an appropriate level of interpersonal distance may evoke positive effects. Discrete objective data on interpersonal distance could be obtained to refine these leadership theories.

In contrast, Bluetooth provides data over much wider distances (up to 10 m; Chaffin et al., 2017) and therefore can be used to establish movement patterns within a particular area (e.g., on campus and in a particular building). For example, Bluetooth technology can provide data on who moves across buildings at which frequencies and with whom they cross paths. These movement data may enable establishing network profiles that provide interesting insights for a range of research fields, including leader distance (e.g., Antonakis & Atwater, 2002), social network perspectives on LMX (Goodwin et al., 2009), or the role of networking itself in leadership development (e.g., Bartol & Zhang, 2007; Burbaugh & Kaufman, 2017).

Bluetooth or infrared sensors are relatively small and can be incorporated into a card or device that a person would attach to their clothing. It is also possible to integrate additional sensors (e.g., microphones) within such badges to collect different types of data simultaneously (e.g., microphones to record vocal behavior, which would allow analyzing tone and pitch; Beyan et al., 2018). Thereby, rich data can be collected relatively easily and non-invasively in a variety of contexts (provided that privacy terms have been agreed on beforehand). In that regard, considering that many countries have begun to employ tracking apps in the fight against the COVID-19 pandemic, organizations and their members may have become more open to participating in research programs involving Bluetooth applications.

A third type of unconventional method concerns kinematic sensors that can track movement. Thereby, researchers can capture the coordination of movement between leaders and followers. This data collection method is particularly interesting for researchers investigating leader and follower behavior in music and sports, as well as in

extreme team contexts such as surgery, emergency response, or the military. In these fields, the physical coordination of team members who are moving through a specific space (i.e., a concert hall, an operating room, a crime site, a burning building, or a battlefield) is a key responsibility of leaders. To offer examples from our review, D'Ausilio et al. (2012) used kinematic sensors in a music orchestra context to study the immediate relationship between the movement of the conductor's baton and the violinists' bows. This is an excellent illustration of studying how leader behavior may directly influence follower behavior. Moreover, Meyer et al. (2016) provided laboratory participants with t-shirts equipped with motion sensors to measure behavioral mimicry. The authors examined whether participants' (i.e., followers') mimicry of body movements mediated the effects of confederates' leadership style (participative vs. directive) on team decision quality and evaluations of the leader. Using this kind of research as an inspiration, researchers could also investigate whether followers' mimicry behavior affects how their leaders perceive them. Moreover, scholars could use kinematic sensors to explore how synchrony in movement among leaders and followers evolves over the course of a meeting and whether this correlates with levels of conflict or solution-finding.

Notably, whereas eye-tracking, Bluetooth, infrared, and kinematic sensors require face-to-face interactions, the increase in the number of remote work settings prompted by the COVID-19 pandemic highlights the need to investigate virtual leader-follower interactions. In virtual settings, vocal expressions and paralinguistics play a particularly important role compared to other nonverbal cues, and we expect to see more unconventional methods evolving that allow exploring leader-follower interactions in virtual or hybrid work settings. Along these lines, leadership research could also leverage the opportunities afforded by developments in virtual reality. Such technology enables presenting vignettes as fully immersive scenarios where participants are able to experience their environment via visual, auditory, and sometimes even tactile and olfactory stimuli (Blascovich et al., 2002). Virtual reality technology allows for precise manipulation of multiple agents (i.e., leaders and/or followers) to study causal antecedents and outcomes of specific behavioral patterns, such as the mimicry or synchrony displayed among leaders and followers. Our review identified one study that instructed participants to assume the role of a leader to conduct a meeting with their followers in an immersive virtual reality setting (Hoyt & Blascovich, 2010). The followers were avatars created by the authors, as this allowed them to control confederates' behavior and demographic characteristics, as well as to save resources. Virtual reality technology offers a host of opportunities for experimentally manipulating avatar appearance, group size, and so forth and investigating how such changes affect interdependent leader-follower interaction dynamics.

To conclude, the unconventional methods outlined above open up new possibilities for investigating behavioral dynamics among leaders and followers. It should be noted, however, that all of these methods tend to produce very large amounts of data and researchers need to make sensible use of this wealth of data and ensure that their conceptual research models map onto these measures. Ideally, such

research would be conducted in interdisciplinary collaboration with computer scientists (Lehmann-Willenbrock et al., 2017).

## 5.5 | Developing theories and analyzing multimodal interaction patterns

### 5.5.1 | Shortcomings

Analysis of multimodal behaviors refers to the simultaneous consideration of several modalities of behavior, such as voice pitch, speaking duration, looking at others, or being looked at. Thus far, multimodal analysis has rarely been used in leadership research and is currently not part of any leadership theory that we are aware of. Our review identified four articles that specifically manipulated different modalities (Gitter et al., 1975, 1976; Laplante & Ambady, 2002; Stein, 1975). For instance, Laplante and Ambady (2002) manipulated leader feedback in terms of verbal content (positive vs. negative) and nonverbal tone (positive vs. negative). They found that participants' productivity and general work satisfaction were affected differently across conditions. The other three studies presented stimuli with recordings of leader-follower interactions across different modalities and combinations of modalities (e.g., only visual but muted material, audio tracks, and audio tracks filtered such that the semantics were obliterated but the tone and pitch of voices were conserved). The authors found that cues across different modalities affect participants' leadership perceptions. In summary, these controlled experiments indicate that different behavioral modalities play an important role in the leadership process, and more systematic research is needed to understand how different modalities interact with each other. We also identified a handful of articles from the domain of social signal processing that considered multimodal interaction patterns in teams and showcase the potential of their application to the context of leadership (Beyan et al., 2018, 2019; Capozzi et al., 2019; Sanchez-Cortes et al., 2013). For example, Sanchez-Cortes et al. (2013) used machine learning to detect socially meaningful behavioral patterns that distinguish leadership behavior (i.e., emergent leadership) and leadership-related constructs (i.e., dominance).

### 5.5.2 | Future avenues

As a first step, theory building needs to incorporate multimodal behavioral elements. DeRue and Ashford's (2010) model of the leadership identity construction process can serve as an example. This model builds on the idea that to develop a leadership identity (i.e., become a leader), an individual (Person A) initiates a leadership claim (e.g., by structuring a discussion or offering a solution). Their counterpart (Person B) may then either grant Person A their claim (e.g., by accepting the solution) or reject it (e.g., by criticizing the idea). Person A's next response or initiative will, at least in part, depend on person B's reaction. Thus, DeRue and Ashford (2010) highlight the role of the process (i.e., an interaction between Persons A and B) that takes place

until a leadership identity is actually established. Note that granting leadership is a way of assuming followership but it does not necessarily have to result in followership. According to the theory, two individuals could both claim leadership and grant it to each other, resulting in a co-leadership situation.

Linking DeRue and Ashford's theory to multimodal interaction patterns makes the model more complex but potentially more concrete. The example of claiming and granting leadership described above focuses on verbal interaction. However, a leadership claim can also occur through nonverbal or paraverbal behavior (e.g., by occupying more space, pulling relevant objects toward oneself, or speaking in a loud voice). The subsequent granting or rejecting behavior could be conveyed in the same modality as the prior claiming behavior, but it might also involve a different modality. For instance, in response to a verbal claim such as an assertively formulated suggestion as to how to proceed, a nonverbal shrinking of one's body posture could be interpreted as a much stronger signal of followership than a verbal "okay." It would be interesting to determine whether some modalities have a stronger influence on the claiming and granting process than others or whether certain modalities are more important at specific stages of the leadership identity construction process (e.g., beginning, midway, or end).

## 5.6 | Naturalistic versus laboratory studies

### 5.6.1 | Shortcomings

The majority (69.6%) of studies included in our review investigated behaviors in lab contexts. Lab experiments allow for high control and are helpful when for investigating the causal effects of specific and isolated behaviors. Indeed, the reviewed studies offer glimpses into a variety of leader and follower behaviors that were investigated via experimental manipulations in the laboratory context. These studies investigated the role of follower behaviors such as being (non)supportive (Gallo & McClintock, 1962), having voice (Krenz et al., 2019), or being assertive (Korsgaard et al., 1998, Study 1), as well as leader behaviors such as consideration and initiating structure behavior (Gilmore et al., 1979), feedback (e.g., Laplante & Ambady, 2002; Li et al., 2014), transformational leadership (e.g., Kovjanic et al., 2013), transactional leadership (e.g., Jaussi & Dionne, 2004), charismatic leadership (e.g., Antonakis et al., 2011, Study 2; Jacquart & Antonakis, 2015; Study 2), and leader emotions (e.g., Olsen et al., 2020; Shao 2019, Study 1). Whereas lab experiments are a suitable tool for testing the internal validity of theories, their external validity (i.e., generalizability to the "real" world) is often limited. Many laboratory studies are still rather artificial and could benefit from following best practice recommendations for increasing realism (e.g., designing video vignettes, promoting greater similarity between the experimental and field settings, and utilizing virtual reality technology; Aguinis & Bradley, 2014). Furthermore, focusing research on the manipulation of behaviors in the lab also bears the risk of hampering inductive or abductive theory building. Placing a stronger emphasis on exploratory work may help researchers to discover leadership and

followership phenomena that have not previously been considered (Antonakis, 2017).

## 5.6.2 | Future avenues

Collecting data in the field rather than in the laboratory is often challenging. We propose five suggestions for addressing this problem. First, contexts that are close to “real-job” situations, such as high-fidelity simulation trainings for health care teams (e.g., Kolbe et al., 2014; Weiss et al., 2017) or team interactions within leader training contexts (e.g., Yoo & Alavi, 2004), offer field settings that are less sensitive in terms of ethical considerations (e.g., surgery on real patients) and in terms of potentially exposing participants' weaknesses or mistakes (e.g., dysfunctional leader behavior) in comparison to “real-job” settings. Therefore, these settings may induce greater feelings of safety among participating leaders and employees. Second, working contexts that are naturally more prone to observation, such as sport contexts (e.g., Tropp & Landers, 1979), musical performances (e.g., Kawase, 2014), or online communities (e.g., Panteli, 2016; Paskewitz & Beck, 2018), can provide fresh insights regarding leader–follower interactions. Third, unconventional data collection methods such as the ones described above may pique participants' curiosity and lower resistance to participation. Fourth, researchers should attempt to identify unique opportunities to access field data. For example, we identified one study in our review that analyzed a large corpus of email communications belonging to a company that had been forced to make these data available following jurisdictional investigations into the company's collapse (Reyt & Wiesenfeld, 2015, Study 1; Toubiana & Zietsma, 2017). Such real communication data are extremely valuable when attempting to obtain insights into actual leader–follower interactions in the field. Fifth, and relatedly, exogenous shocks occurring to an organization and to the existing leader–follower interactions within that organization can also provide a viable research context in which to gather field data. For example, experiences with changes in work settings due to the COVID-19 crisis may have positive side effects for leadership research. Many leaders (and the rest of the workforce) have been forced to switch to online modes and engage with technological settings that allow researchers to access actual interactions without interfering with participants' work (e.g., by analyzing recordings of video calls). This entails that new challenges arise in terms of remote leadership and followership when leader–follower interactions mainly take place in virtual settings. The need to cope with these developments in organizational practice may increase the willingness of organizational decision-makers to participate in research, which will in turn create new opportunities for leadership scholars.

## 6 | CONCLUSION

Our systematic review integrates insights and distills a future research agenda from studies that have objectively observed, manipulated, or

trained leader and/or follower behavior. First, we provided an integrative overview of the underlying questions that have been addressed in previous behavior-based leadership research by extracting the examined conceptual models and thereby also categorizing extant studies according to their temporal scopes. This analysis revealed that leadership research is indeed extremely leader-focused, with the two predominant research foci being the usage of leader behavior as a predictor (mainly studied at the micro-time level) or training leader behavior as an independent variable (mainly studied at the mega-time level). We conclude that future research could benefit from developing theories and collecting data that link perceptions of leader and/or follower behavior with actual leader and/or follower behavior, performing data analyses over time and over more than one temporal level, and analyzing interdependent behavioral patterns between leaders and followers. In terms of the preferred types of behaviors studied in extant research, we found that both lab and field research largely focused on verbal behavior, with lab research mostly manipulating this behavioral type and field research being prone to observations. Overall, the number of lab studies largely outnumbers the number of field studies. We utilized the insights from this overview to identify three future research directions intended to encourage researchers to move the field forward: leveraging unconventional methods for data collection, developing theories of and empirical insights into multimodal leader–follower interaction patterns, and devoting more efforts to studying leadership and followership in the field.

We hope that the insights obtained through this review encourage scholars to explore new approaches to studying leader and follower behavior. They can seek inspiration from prior studies in which the authors meticulously manipulated and observed behaviors, and our review can serve as a point of reference in this regard. In addition, recent advancements in technology open numerous additional avenues for behavior-focused research, and we discussed several unconventional data collection methods that can innovate research on interdependent leader–follower behavior. Our hope is that the insights from our review will ultimately help to advance leadership and followership theories by encouraging scholars to thoroughly define and refine their constructs in such a way that they can be operationalized in the form of concrete behaviors.

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## ENDNOTES

<sup>1</sup> *Training* included all field studies that trained real leaders (managers and supervisors) and employees with a particular focus (e.g., charismatic leadership; Antonakis et al., 2011; employee behavior in appraisal interviews; Korsgaard et al., 1998, Study 2). *Manipulation* included all laboratory studies that manipulated leader or follower behavior via trained confederates, specific stimulus material (e.g., video clips), or specific participant instructions. *Observation* included both field and laboratory studies that involved observing behavior live or via video and audio recordings. Finally, *critical incidents* included qualitative field studies that focused on interviewing participants to describe in detail the unfolding

of leader–follower interactions (from both perspectives). Please note that many studies employed several methodological approaches (e.g., manipulation and observation), which is why the numbers in Figure 1a,b do not add up to 100%. For example, Antonakis et al. (2011, Study 2) invited participants to their lab to deliver a short speech before and after a charisma workshop (=Manipulation). Speeches were video-recorded, and independent raters rated the charismatic behavior exhibited by the participants in both speeches (=Observation).

<sup>2</sup> Note that there is a critical difference between the (temporal) level of data collection and the (temporal) level of analysis. For example, a researcher who records an hour-long meeting and codes all verbal utterances (which are typically a few nanoseconds to seconds long) has two broad options in terms of temporal scope considerations: First, they could run analyses on overall frequencies or percentages across the entire duration of the meeting (i.e., micro-level), thereby losing more fine-grained temporal information. Second, they could consider behaviors at a smaller scale (e.g., at 5-min intervals) or even conserve the temporal sequence in their analysis, which would make it possible to draw conclusions at smaller temporal scopes (i.e., nano-level). In this review, we focus on the level of analysis to determine the temporal scope a specific study focuses on.

<sup>3</sup> It is interesting that several studies have collected data on more than one behavioral type, but, as we outline in more detail in the future research section, they have rarely considered several modalities simultaneously. For example, Maran et al. (2019, Study 2) recorded their participants' (i.e., leaders') gaze while the latter talked to their followers (i.e., confederates) to motivate them to contribute to a task. Naïve observers rated these motivational speeches in terms of *verbal* and non-verbal (*facial expressions* and *gestures*) charisma.

<sup>4</sup> Note that some studies (4.1%) considered the same behavior at two or more temporal levels. For example, Lehmann-Willenbrock et al. (2015) examined sequences of solution-oriented leader statements and solution-oriented team communication at the nano-level and overall frequencies of solution-oriented behavior across a meeting.

## DATA AVAILABILITY STATEMENT

Data available in article supplementary material

## ORCID

Clara Sofie Hemshorn de Sanchez  <https://orcid.org/0000-0003-3122-8721>

Fabiola H. Gerpott  <https://orcid.org/0000-0002-2585-3427>

Nale Lehmann-Willenbrock  <https://orcid.org/0000-0003-3346-5894>

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## AUTHOR BIOGRAPHIES

**Clara Sofie Hemshorn de Sanchez** is a research associate and doctoral student at the Department of Industrial and Organizational Psychology at the University of Hamburg. Her research interests focus on video-based observation methods, leader-follower interactions, and team processes.

**Fabiola H. Gerpott** is a professor of leadership at the WHU – Otto Beisheim School of Management in Düsseldorf, Germany. She received a double PhD in Business Administration from the Jacobs University Bremen and Vrije Universiteit Amsterdam. In her research, she focuses on leader-follower-dynamics and the behavioral building blocks of leadership.

**Nale Lehmann-Willenbrock**, PhD, is a professor of Organizational Psychology at the University of Hamburg, in Hamburg, Germany. She received her PhD summa cum laude from TU Braunschweig in Germany in 2012 and holds a Master's (2006) and Bachelor's (2003) degrees in Psychology from the University of Göttingen in Germany. Her research is aimed at understanding how the social context shapes organizational behavior, specifically via the dynamic behavioral and temporal interactions in group meetings.

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