



Organizational Behavior

Whistleblowing Paradigms

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Operationalizing whistleblowing in a valid paradigm is an important yet challenging endeavor. In the present article, we review four categories of whistleblowing paradigms—scenario studies, autobiographical recalls, immersive behavioral paradigms, and economic games—and discuss how they capture the definitory features of whistleblowing. Moreover, we evaluate the strengths and weaknesses of each paradigm along selected psychometric criteria. Our review suggests that each of these paradigms comes with individual strength and weaknesses regarding the robustness against socially desirable responding, their efficiency, and whether or not they avoid using deception. We call for future research to conduct multi-method studies combining the four categories of whistleblowing paradigms within the same sample in order to test their convergence empirically.

Whistleblowers have repeatedly contributed to the detection and prosecution of scandals in corporations (e.g., McCrum et al., 2021), politics (e.g., Miller et al., 2019), science (e.g., Bhattacharjee, 2013; also see Stroebe et al., 2012), and the military (e.g., Manning, 2015). These examples anecdotally illustrate the role of whistleblowing as an important mechanism that enables societies to identify and correct wrongdoing—wrongdoings that arguably would not have been revealed without whistleblowers. But despite the societal importance of whistleblowing, conducting empirical research on its antecedents and consequences is a challenging endeavor. While various theoretical articles, books, and chapters on whistleblowing have been published in the last 20 years (e.g., Anvari et al., 2019; Brown et al., 2014; Culiberg & Mihelič, 2017; Gundlach et al., 2003; Miceli et al., 2008; Miceli & Near, 2005), empirical research in this field is comparably scarce. In their review article, Miceli and Near (2005) argued that “the primary causes for the underdevelopment of the empirical literature are methodological, and that workable solutions are needed.” (p. 130).

Indeed, methodological challenges are inherent to the empirical study of whistleblowing. This is because observing whistleblowing “in the wild” (i.e., in organizations) is challenging given that whistleblowing (1) is a relatively rare

phenomenon (Olsen, 2014), (2) occurs embedded in an organizational context (Jubb, 1999; Near & Miceli, 1985), and (3) is a highly confidential matter about which the involved individuals and organizations do not necessarily want to reveal details to scientists (Miceli & Near, 2005). These circumstances make it difficult for researchers to collect extensive data on whistleblowing in the field. Therefore, researchers have developed online and lab-based paradigms to operationalize whistleblowing in order to investigate the social and psychological antecedents and consequences of whistleblowing in controlled settings. Broadly speaking, there are four categories of whistleblowing paradigms: (1) scenario studies (measuring whistleblowing intentions), (2) autobiographical recall studies (assessing retrospective and self-reported whistleblowing behavior), (3) immersive behavioral paradigms, and (4) economic games.¹ Our review will contribute to the search for “workable solutions” that Miceli and Near (2005) called for by discussing how these four whistleblowing paradigm categories incorporate definitory features of whistleblowing, evaluating strengths and weaknesses of each whistleblowing paradigm category, and formulating recommendations for future research.²

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¹ Here, we focus on primary research and therefore willfully refrain from considering secondary research approaches (e.g., analyses of archival data; Dworkin & Baucus, 1998). Also, we do not consider prospective correlational studies (i.e., studies measuring independent variables before it is known who will once become a whistleblower) because we are not aware of any empirical study that has used this approach.

² The structure of this manuscript was inspired by a recent review on lab-based aggression paradigms (McCarthy & Elson, 2018) which we found tremendously helpful for our perspective on whistleblowing paradigms.

Conceptualizing Whistleblowing

A well-established definition conceptualizes whistleblowing as “[...] the disclosure by organization members (former or current) of illegal, immoral, or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action” (Near & Miceli, 1985, p. 4). This definition consists of three central components: First, whistleblowing is a response to an *observed wrongdoing*, that is defined as an illegal, immoral or illegitimate practice. According to this definition, the wrongdoing may be all kinds of moral or legal norm violations, encompassing both intentional as well as unintentional actions (see Skivenes & Trygstad, 2014). Second, the observed wrongdoing occurs in the context of an organization while the potential whistleblower is a (former or current) member of the same organization. In other words, whistleblowing entails a *common organizational membership* of the person responsible for the wrongdoing (henceforth: the wrongdoer) and the whistleblower.³ Of note, the wrongdoer in a whistleblowing episode may be a person who actively contributes to a wrongdoing (e.g., an accountant falsifying balance sheets) or someone who passively but knowingly tolerates or even instructs other to engage in wrongdoing in their organization (e.g., a manager tolerating financial fraud within their organization). Third, whistleblowing is an act of *information disclosure* about the observed wrongdoing, directed at a recipient that “may be able to effect action” (Near & Miceli, 1985; for elaborations on the role of whistleblowing recipients, see Moberly, 2014). These whistleblowing recipients may be persons or institutions within the same organization (e.g., the management; “internal whistleblowing”) or external to the organization (e.g., the media; “external whistleblowing”; see Dworkin & Baucus, 1998).

Building on this definition, we argue in order to ensure construct validity, every solid whistleblowing paradigm must mirror these three definitory aspects. Thus, whistleblowing paradigms must (1) incorporate an observable wrongdoing (*the observable wrongdoing criterion*), (2) establish a common organizational membership between wrongdoer and the potential whistleblower, (*the common organizational membership criterion*) and (3) provide an opportunity to disclose information about the wrongdoing to a person or body that may rectify the situation (*the information disclosure criterion*).

Alternative Whistleblowing Definitions

Before we turn to our review of different whistleblowing paradigms, we would like to note that the whistleblowing

definition by Near and Miceli (1985) is not undisputed. In essence, some scholars have argued for a narrower definition that restricts whistleblowing to voluntary or non-obligatory acts and/or to disclosures that are made to recipients *external* to the organization (e.g., authorities or media) only (Jubb, 1999). Then again, other scholars have proposed that only non-anonymous disclosures should be viewed as whistleblowing (Bjørkelo, 2016; Bjørkelo et al., 2011). While we acknowledge that these specifications are appropriate for some research areas, we nonetheless focus on Near and Miceli’s definition (1985) in the our current work because it is conceptually broader and thus more comprehensive. If researchers employ a more restrictive definition in their empirical studies, their whistleblowing paradigm must correspondingly reflect additional definitory criteria; but the observable wrongdoing, common organizational membership and information disclosure criteria must be necessarily reflected in every whistleblowing paradigm.

Conceptual Boundaries of Whistleblowing

The whistleblowing definition by Near and Miceli (1985) mentioned above also allows a differentiation between whistleblowing and other related concepts. First, and most importantly, their definition excludes cases in which organizational wrongdoing is disclosed by “outsiders” instead of “insiders”, that is, by people who are not (and have never been) members of the organization in which the wrongdoing occurred. This is, for example, often the case with investigative journalism: Investigative journalists can receive and publish disclosures made by whistleblowers, but they are typically not whistleblowers themselves (Bosua et al., 2014). Second, reporting organizational wrongdoings can only be conceptualized as “whistleblowing” if these reports are addressed to “persons or organizations that may be able to effect action.” Thus, informal conversations about organizational wrongdoings with friends or family members, for example, do not constitute whistleblowing.

The Psychological Nature of Whistleblowing

Many whistleblowing cases not only share the necessary definitory features put forward by Near and Miceli (1985), but also additional, psychologically relevant properties. Crucially, many scholars have interpreted whistleblowing situations as a dilemma, in the sense that whistleblowers need to balance loyalty towards one’s organization on the one hand and fairness towards those who are harmed by the organizational wrongdoing on the other hand (Dungan et al., 2015; Jubb, 1999; Treviño et al., 2014; Waytz et al.,

³ Of note, some other definitions do not agree with the notion that common organizational membership between the wrongdoer and whistleblower is a definitory feature of whistleblowing. Jubb (1999), for example, emphasized that a whistleblower must have “privileged access to data or information of an organisation” (p. 78) but does not necessarily have to be a (former or current) member of that organization. This definition consequently also qualifies consultants or service contractors as potential whistleblowers. Anvari et al. (2019) concur with the notion that whistleblowers do not need to be formal members of the offending organization—what really matters is that the whistleblower identifies with the offending group/organization.

2013). For instance, if a company deceives its customers by withholding information about potentially harmful consequences of their products, employees may either adhere to organizational norms and tolerate such conduct, or adhere to societal norms by informing the public about these harmful consequences. Thus, whistleblowing can be conceptualized as a prosociality trade-off at different levels: Prosociality towards one's organization (i.e., loyalty) versus prosociality towards society more broadly.

How people navigate this dilemma remains, however, not fully understood; and this is arguably due to an underdevelopment of the empirical whistleblowing literature. The most comprehensive empirical evidence on predictors of whistleblowing behavior was provided by Mesmer-Magnus and Viswesvaran's meta-analysis (2005), which, in essence, reports the following findings: Whistleblowing behavior was more likely when (1) the actor was female (vs. male), (2) when the actor was tenured (vs. untenured), (3) when the actor was more satisfied with their job, (4) when the actor showed better job performance, (5) when the observed wrongdoing was increasingly serious, (6) when the organization had a climate favoring whistleblowing, and (7) when supervisor support was perceived to be low.⁴

However, it should be noted that the empirical basis for this meta-analysis was relatively small: Each of these meta-analytic associations were derived from two to six primary studies only. Moreover, many theoretically plausible effects had not been empirically investigated by that time and were therefore not included in the meta-analysis. For instance, Mesmer-Magnus and Viswesvaran's meta-analysis (2005) is mute about which personality traits predict whistleblowing, how (other) situational features affect whistleblowing (e.g., whether more or less bystanders relate to more whistleblowing), and how these person-characteristics and situation-characteristics interact in the prediction of whistleblowing. And even today, these potential antecedents of whistleblowing remain understudied. We hope that methodological progress in whistleblowing research (to which we aim to contribute by the present paper) will eventually accelerate empirical progress, for example with regard to these open research questions.

Whistleblowing Intentions vs. Whistleblowing Behavior

The whistleblowing definition by Near and Miceli (1985) indicates that whistleblowing constitutes a specific type of

behavior: An act of information disclosure. Therefore, every solid whistleblowing paradigm should allow an observation of actual behavior. That being said, it is also fair to assume that whistleblowing usually represents a form of planned rather than spontaneously executed behavior. Under this assumption, whistleblowing behavior should be preceded by the *intention* to blow the whistle (Ajzen, 1991; also see Bjørkelo & Bye, 2014). Consequently, a widely-used empirical approach is to study whistleblowing intentions instead of (or in addition to) whistleblowing behavior (e.g., Chiu, 2003; Ellis & Arieli, 1999; Helzer et al., 2022; Waytz et al., 2013). We argue that this methodological approach can be valuable under specific circumstances (which we will outline towards the end of our review), but it is important to emphasize upfront that whistleblowing intentions and whistleblowing behavior should be treated as distinct constructs rather than viewing whistleblowing intentions as an operationalization of whistleblowing behavior (Bjørkelo & Bye, 2014). In line with this idea, meta-analytical research has provided evidence that whistleblowing intentions and whistleblowing behavior do not necessarily share the same predictors (Mesmer-Magnus & Viswesvaran, 2005).

Four Categories of Whistleblowing Paradigms

As previously noted, we consider four categories of whistleblowing paradigms in the current review: Scenario studies, autobiographical recall studies, immersive behavioral paradigms, and economic games. [Table 1](#) shows one empirical example for each of these whistleblowing paradigms. In the following section, we will describe these whistleblowing paradigms in greater detail by discussing how they capture the three whistleblowing criteria we delineated before (i.e., the observable wrongdoing, common organizational membership, and information disclosure criteria).⁵

Scenario Studies

Scenario studies represent an easy-to-implement approach to study responses to social situations.⁶ Participants read a short description of a (fictitious or real) situation and are instructed to imagine themselves vividly in this scenario, including feelings and thoughts that might emerge in such a situation. Thereafter, participants are asked to report how they would feel, think, or react in the described situation. Applying this method to the study of whistleblowing is a true classic that has been used over and over

4 Note that these findings are those with correlations of at least $r = .10$ with actual whistleblowing behavior. We do not discuss the meta-analytic findings for whistleblowing intentions nor findings yielding associations smaller than $r = .10$.

5 Note that we will focus on the methodology of the reviewed paradigms and we will not discuss the results of these studies in greater detail. However, we have compiled the results of some studies in Table S1. More specifically, this table shows one study per whistleblowing paradigm that focused on the effects of broad personality dimensions (i.e., the Five-Factor Model or the HEXACO; Ashton & Lee, 2007; McCrae & Costa, 1999) on whistleblowing. We chose this subfield of whistleblowing research because we found at least one published study for each of the four whistleblowing paradigms, thereby enabling an illustration of how a research question can be studied with different whistleblowing paradigms.

6 Some scholars use the term „vignette” instead of “scenario.”

Table 1. Overview and Examples of Commonly-Used Whistleblowing Paradigms

Construct	Type of study	Example article	Whistleblowing operationalization in example article
Whistleblowing intentions	Scenario study	Ellis & Arieli, 1999	<ul style="list-style-type: none"> Scenario: "An officer in your brigade, above you in rank, gave soldiers permission to go on leave and to hitchhike in places and hours that are forbidden." (p. 954) Variable: "If you encountered this situation, would you report it?" (p. 954), assessed on a 7-point response scale
Whistleblowing behavior	Autobiographical recall	Dungan et al., 2019	<ul style="list-style-type: none"> Variable: Indicating that (a) participants had "personally observed or obtained direct evidence of one or more illegal or wasteful activities involving [their] agency" (single-choice, yes/no) AND (b) "reported the activity to one or more of the following [...]: their immediate supervisor, a higher-level supervisor or agency official, the Agency Inspector General, the Office of Special Counsel, the Government Accountability Office, a law enforcement official, a union representative, the news media, a congressional staff member or member of Congress, or an advocacy group outside the Government." (multiple-choice) (p. 4)
Whistleblowing behavior	Immersive behavioral paradigm	Bocchiaro et al., 2012	<ul style="list-style-type: none"> Paradigm: Participant (allegedly) learns about the traumatic effects of a study and is nonetheless asked to advertise this study as "exciting" to potential future participants Variable: Reporting an experimenter's unethical request to an ethics committee by filling out a complaint form and putting it into a mailbox in the laboratory
Whistleblowing behavior	Economic game	Butler et al., 2020	<ul style="list-style-type: none"> Paradigm: "Manager" is a role in the economic game that has the possibility to "break the law". The law-breaking option generates a financial benefit for all organization members (i.e. the manager as well as their employees) but a financial loss to players outside of the organization ("members of the public") Variable: "Would you blow the whistle if you found out that your manager broke the law?" (yes/no; strategy elicitation method). The whistleblowing option created a loss to the whistleblower and the manager but had no financial effects on members of the public

Note. A graphical illustration of the economic game paradigm developed by Butler et al. (2020) is shown in Figure S1.

again (e.g., Chiu, 2003; Ellis & Arieli, 1999; Fischer, 2022; Helzer et al., 2022; Waytz et al., 2013).

What is the Wrongdoing?

Creating scenarios that describe a wrongdoing in the context of an organization is quick, cheap, and flexible. As such, researchers can easily describe all kinds of wrongdoings such as stealing (Waytz et al., 2013; Study 1), corruption (Chiu, 2003), accounting fraud (Helzer et al., 2022), or data manipulation in scientific research (Anvari, 2018). Some studies have made use of scenarios that were inspired by true real-life whistleblowing cases while others have created purely fictitious situations that fit the specific purpose of the respective study.

What is the Common Organizational Membership?

Generally speaking, there are two options to establish a common organizational membership between the wrongdoer and the whistleblower (i.e. the participant) in scenario studies. First, the common organizational membership can be fully fictitious in the sense that participants are instructed to imagine belonging to a certain organization and that the wrongdoer also belongs to the same organization. Alternatively, researchers can try to make use of

participants' real organizational membership (i.e., by sampling employees of one specific organization) and instructing them to imagine that a member of the same organization engages in wrongdoing (see Ellis & Arieli, 1999).

How and to Whom is the Information Disclosed?

The disclosure of information is operationalized simply by asking participants to rate their intentions to disclose information about the wrongdoing, either on a Likert scale (e.g., "How likely is it that you would report this practice to someone who might be able to effect action?"), ranging from 1 = *not at all* to 6 = *very likely*) or as a dichotomous variable (e.g. "Would you report this practice to someone who might be able to effect action?", yes/no). Sometimes, researchers also specify the recipient of the disclosure, for example by asking whether the participant would like to disclose information regarding wrongdoing to the authorities (see Anvari, 2018). The flexibility of scenario studies also allow contrasting between internal and external whistleblowing intentions (see Helzer et al., 2022), for instance, by asking participants whether they would disclose information internally (e.g., to the HR department or the management) versus externally (e.g., to the media or legal authorities).

Autobiographical Recall Studies

Another straightforward whistleblowing paradigm is to ask participants to recall a situation in which they have previously observed some kind of immoral or illegal practices under the control of their employer and whether or not they disclosed this practice to someone who they thought might be able to effect action. According to the definition by Near and Miceli (1985), participants who answer both questions in the affirmative can be classified as (self-reported) whistleblowers. Empirical studies that used this method were, for example, conducted by Dungan et al. (2019), Near et al. (2004) as well as by Miceli and Near (1988). A close variant of this method is to present participants with an operational description of whistleblowing and ask them directly whether this definition applies to them (see Bjørkelo et al., 2010, 2011).⁷

What is the Wrongdoing?

In contrast to all other whistleblowing paradigms presented in this review, autobiographical recall studies do not describe or induce one specific type of wrongdoing but rather rely on wrongdoings that occurred “in the real world”: Participants report a wrongdoing that they have actually observed in the context of their organization. Wrongdoings that have repeatedly emerged in autobiographical recall studies on whistleblowing belong to the categories of harassment, bullying, safety violations, or mismanagement (Bjørkelo et al., 2010; Near et al., 2004).

What is the Common Organizational Membership?

Autobiographical recall studies on whistleblowing also make use of naturally occurring organizational memberships, for example by asking participants to recall an instance where they obtained evidence of wrongdoing “at work” (Bjørkelo et al., 2010, p. 214), involving “their own organization” (Near et al., 2004, p. 226) or involving “their agency” (Dungan et al., 2019, p. 4). In some studies, participants from various organizations were recruited (Dungan et al., 2019) whereas sampling was restricted to only one organization in other studies (Near et al., 2004).

How and to Whom is the Information Disclosed?

To assess whether the observed wrongdoing was disclosed to someone who could intervene, participants in autobiographical recall studies are usually asked whether or not they reported the wrongdoing, and if so, to whom. To this end, Near et al. (2004) who sampled employees of a large military base, differentiated between several internal recipients (e.g., the “immediate supervisor” or a “higher level supervisor”) and several external recipients, thereby allowing to distinguish internal from external whistleblowing. Similarly, Dungan et al. (2019) provided a list of whistleblowing recipients that allowed a post-hoc differentiation of internal and external whistleblowing (see [Table 1](#)). By contrast, Bjørkelo et al. (2010) did not list specific persons or bodies as whistleblowing recipients but asked participants explicitly whether they used internal reporting channels, external reporting channels, or a combination of both.

Immersive Behavioral Paradigms

A third category of whistleblowing paradigms—yet a relatively rare one—consists of lab studies in which participants’ actual whistleblowing behavior is observed and analyzed (see, for instance, Bocchiaro et al., 2012; Miceli et al., 1991). In these paradigms, researchers stage a fictitious situation (typically in a lab-based environment) which provides an opportunity to blow the whistle on an observed wrongdoing. Oftentimes, participants are deceived about the real purpose of the study by using an elaborate cover story.⁸

What is the Wrongdoing?

Given that immersive behavioral studies on whistleblowing are usually conducted in a researcher’s lab on campus, participants are typically students. Therefore, the wrongdoing often represents a violation of academic, research-related, or campus-related norms. For instance, Miceli et al. (1991) conducted a lab study where they led participants to believe that the preliminary results of an ongoing study did not confirm the researcher’s predictions, thereby allegedly reducing the likelihood that the results were publishable. Next, participants were informed about the experimental condition they were ostensibly assigned to as well as about the hypotheses for this particular condition. The experimenter then asked the participant to provide re-

⁷ Arguably, research focusing exclusively on known whistleblowers, for example through qualitative interviews (e.g., Kölbel & Herold, 2019), can be subsumed under autobiographical recall studies as well. In the present manuscript, we focus more on quantitative autobiographical recall studies which usually contrast whistleblowers with a control group of non-whistleblowers.

⁸ Of note, Waytz et al. (2013) reported a study (Study 4) that can be interpreted as an online-variant of an immersive behavioral paradigm. In this study, participants, who were recruited via Amazon MTurk, were confronted with the careless work of another participant (who had ostensibly also participated on MTurk). Participants then had the chance to report the other participant to the experimenter by indicating the extent to which they thought the other participant had violated rules and the extent to which they recommended blocking that participant from future studies. We do not discuss this paradigm in greater detail in the current manuscript (a) because the wrongdoing was arguably too mild for being considered an “immoral practice” (see whistleblowing definition at the beginning of our manuscript) and (b) because the dependent variables arguably tapped more into punishment or peer reporting than into whistleblowing behavior.

sponses that fitted the researchers' hypotheses and left the room. Such a request clearly represents a form of scientific misconduct by the experimenter.

Similarly, Bocchiaro et al. (2012) invited participants to the lab where they were told that the experimenter had conducted a pilot study on "sensory deprivation of brain functions." Participants were told that this pilot study had elicited traumatic experiences (e.g., panic, hallucinations, etc.) in previous trials. Nonetheless, the experimenter asked the participant to write a testimonial for some of their fellow students, indicating that they found the experiment "exciting" and "incredible" while concealing the allegedly traumatic effects. This request—writing an endorsing statement for a potentially harmful study—clearly violates ethical standards of conducting research (see American Psychological Association, 2017) and, thus, served as the wrongdoing in this study.

What is the Common Organizational Membership?

In immersive behavioral paradigms, researchers often try to make use of a participant's real organizational membership. For example, both Bocchiaro et al. (2012) and Miceli et al. (1991) utilized the common organizational membership of a university, by informing participants (who were all students of the same university) that the wrongdoer was a researcher at the same university.

How and to Whom is the Information Disclosed?

In contrast to scenario or autobiographical recall studies, immersive behavioral paradigms provide the opportunity to observe actual whistleblowing behavior rather than relying on self-reports. Miceli et al. (1991)—in their study staging a data fudging request by the experimenter—embedded their dependent measure of information disclosure in a questionnaire that the participants were asked to complete during the course of the study. First, participants were asked to indicate whether they were asked to do something they considered objectionable during the study using "yes", "no" or "can't remember" as response categories. Next, participants who indicated "yes" were asked to describe the objectionable request in an open-response format. After completion of the study, two trained raters coded whether or not participants actually described the data fudging request as the objectionable practice. Participants who responded "yes" to the first question and later clearly described the data fudging incidence as the objectionable request were classified as whistleblowers.

Bocchiaro et al. (2012)—in their study staging a request to write a testimonial of a potentially harmful study—used a slightly different approach. They conducted their study in a laboratory room with a postbox on the wall and participants were informed that they could drop a note in the postbox to inform the local ethics committee about unethical conduct. This action—leaving a note to inform the local ethics committee in the postbox—served as the behavioral measure of whistleblowing.

Economic Games

A fourth and final category of whistleblowing paradigms we consider in this review are economic games. These paradigms are "economic" in the sense that participants make decisions about the allocation of economic resources (e.g., money, vouchers, lottery tickets, etc.). They are referred to as "games" because the decisions participants make are artificial in the sense that they would not occur as such in real life. That being said, these decisions and the specific constraints under which they are made structurally mirror real-life situations, such as bargaining situations (for instance, in an "ultimatum game") or social dilemmas (for instance, in a "public goods game"). Very often, the allocation decisions that participants can make are more or less prosocial (in the sense that the allocation benefits another person; see Thielmann et al., 2020). Recently, economic games specifically tailored to model whistleblowing behavior have been developed (e.g., Bartuli et al., 2016; Butler et al., 2020). Figure S1 illustrates the "Whistleblowing Game" introduced by Butler et al. (2020) in order to facilitate a better understanding of this paradigm.

What is the Wrongdoing?

Wrongdoings that are implemented in "whistleblowing games" are typically unfair or unethical allocation of monetary resources. Butler et al. (2020), for example, assigned participants randomly to one of two roles: Members of a firm or members of the public. Each firm consisted of two members in the role of "employees" and one member in the role of a "manager." During the whistleblowing game, both employees of each firm completed a number of real-effort tasks (i.e., adding two-digit numbers) that generated earnings for themselves as well as for the collective "firm fund." Simultaneously, the manager also had the chance to contribute to the firm fund by completing a more difficult real-effort task (i.e., multiplying two-digit numbers). As an alternative to solving this real-effort task, the manager could also "break the law", a behavioral option which deducted money from members of the public, but generated money for their firm. This law-breaking option modelled wrongdoings in which an organization exploits members of the public (e.g., the society), such as example tax fraud (see Figure S1).

A second implementation of an economic game modelling whistleblowing can be found in Bartuli et al. (2016). In their whistleblowing game, companies consisted of two members: one manager and one employee. Similarly to Butler et al. (2020), members of a company individually completed a series of real-effort tasks (i.e., counting the occurrence of a certain number in a matrix). The company received money for each successfully completed task, and this money was shared between the manager and the employee at a 6:4 ratio. At a later stage of the experiment, the manager received an additional amount of money that they were instructed to transfer to a charity organization. Alternatively, the manager could transfer this money to the company's fund, thereby generating a financial benefit for the own company at the costs of the charity organiza-

tion. The latter option—exploiting a charity organization for one’s own (and for the other player’s) benefit—served as the wrongdoing in this study.

What is the Common Organizational Membership?

Economic games are usually implemented as computer-mediated interactions. Thus, participants do engage vis-à-vis with their interaction partner and consequently do not know whether or not they share a common organizational membership (e.g., whether or not both players belong to the same university). Therefore, a common organizational membership has to be induced through the experimental procedure, for example, by assigning players to the same “company.” Moreover, in line with Anvari et al.’s (2019) notion that organizational membership needs to be psychologically experienced rather than only formally defined, researchers additionally often seek to create a feeling of cohesion or a common identity among players of the same company. We describe two procedures designed to create a common identity among players of the same “company” in the following.

Butler et al. (2020) instructed participants to individually solve a series of addition and multiplication tasks. In addition, participants also completed a variant of the “Kandinsky and Klee painting elicitation task” originally designed by Tajfel et al. (1971). In this version of the task, participants see a number of paintings and have to guess whether they were drawn by Kandinsky or Klee. Although each of the three tasks are solved individually, participants gained additional pay-off if at least one member of the company solved the respective task correctly. The interdependent outcomes in these tasks were designed to stimulate “a sense of identity and social cohesion among each firm’s members” (Butler et al., 2020, p. 608). Similarly, Bartuli et al (2016) instructed the employee and the manager of a firm to complete a number of real-effort tasks (i.e., counting the occurrence of a specific number in matrices) and paid them according to the number of tasks their firm (i.e., their manager and themselves) had correctly solved.

How and to Whom is the Information Disclosed?

In Butler et al. (2020)’s study, participants were informed that whistleblowing would be costly for themselves and as well as for their manager, but would not have financial benefits for the public. To operationalize whistleblowing, employees of each firm were asked “whether they would blow the whistle if they found out that their manager broke the law” (p. 609), thereby implementing the so-called “strategy elicitation method.” This method keeps participants uninformed about the manager’s decision (i.e., whether or not the manager broke the law) as long as the dependent variable is not yet assessed. After participants had decided whether they would like to blow the whistle if their manager broke the law, they learned about the managers actual behavior and—if the manager did indeed break the law and the participant opted for the whistleblowing option—the financial consequences of the whistleblowing option (i.e., fi-

nancial costs for themselves and the manager) were implemented.

In Bartuli et al. (2016)’s study, employees were informed about the manager’s decision, that is, whether they either transferred the money to the charity organization (in line with the instructions) or kept the money at the company (“embezzlement”). Only if the manager opted for the embezzlement option, the employee was asked whether they would like to blow the whistle. The whistleblowing option was costly for both the employee and the manager. As a major distinction of this game as compared to the paradigm by Butler et al. (2020), participants played this game over multiple rounds rather than once, thereby modeling that, in real-life whistleblowing situations, employees often have more than a single opportunity to report organizational wrongdoing.

Strength and Weaknesses of Whistleblowing Paradigms

We now turn to an evaluation of the strengths and weaknesses of these four whistleblowing paradigm categories. Our ambition was to consider a broad array of different pros and cons of these whistleblowing paradigms; therefore, we chose three conceptually diverse evaluation criteria: One methodological criterion (i.e., the extent to which participants’ responses in these paradigms are robust against socially desirable responding), one economic criterion (i.e., the amount of monetary and time resources these paradigms require), and one ethical criterion (i.e., whether or not these paradigms can be implemented without deceiving participants about the real purposes of the experiment).

Robustness Against Socially Desirable Responding

Socially desirable responding has been defined as “the tendency of individuals to present themselves favorably with respect to current social norms and standards” (Zerbe & Paulhus, 1987, p. 250). Socially desirable responding in whistleblowing research is problematic because it threatens the construct validity of the measurement, in the sense that observed whistleblowing behavior (or intentions) may not only reflect “true” whistleblowing tendencies, but also tendencies to display oneself favorably with regard to social norms.

In fact, responses in all four whistleblowing paradigms are somewhat prone to socially desirable responding, but some arguably more than others. More specifically, we argue that a paradigm is relatively robust against socially desirable responding either when participants cannot easily recognize which construct the researcher intends to measure or if faking one’s responses in the socially desirable direction is costly. Applying these two criteria, we propose that economic games are strong with regard to their robustness against socially desirable responding because they make socially desirable responding (i.e., whistleblowing) costly. Likewise, immersive behavioral paradigms should be relatively strong with regard to their robustness against socially desirable responding because these paradigms incor-

porate only few demand characteristics, thereby making it difficult for participants to understand that the situation was created to assess whistleblowing and to adjust their behavior towards more whistleblowing. By contrast, scenario studies are relatively weak with regard to their robustness against socially desirable responding because participants can easily recognize which construct the experimenter seeks to measure, and additionally, shifting one's response towards more whistleblowing intentions is non-costly. Lastly, autobiographical recall studies also provide cues that enable participants to easily recognize that the experimenter seeks to assess whistleblowing, and faking one's behavior towards more whistleblowing does not come at a monetary cost. However, shifting one's responses towards more whistleblowing in autobiographical recall studies would be dishonest and arguably, the threshold of indicating that one *has blown the whistle* (as in autobiographical recall studies) is higher than indicating that one *would blow the whistle* (as in scenario studies). Therefore, we evaluate the degree of robustness against socially desirable responding in autobiographical recall studies as mixed.

It is informative for our evaluation of the different whistleblowing paradigms as more or less robust against socially desirable responding to compare whether and how whistleblowing rates (i.e., the relative frequency of whistleblowing) differ across paradigms: Paradigms with weak or mixed levels of robustness against socially desirable responding (i.e., scenario studies and autobiographical recall studies) should yield higher whistleblowing rates than paradigms that are stronger with regard to their robustness against socially desirable responding.⁹ To enable such comparisons, we selected two studies for each of the four paradigm categories and report their whistleblowing rates in [Table 2](#).¹⁰ This comparison shows that whistleblowing rates were indeed relatively high (i.e., greater than 60%) in scenario studies but substantially lower (i.e., lower than 40%) in immersive behavioral studies and economic games.

Efficiency

The reviewed whistleblowing paradigms differ with regard to the resources they require, thereby referring to the criterion of efficiency (Kubinger, 2019). Arguably, scenario studies and autobiographical recall studies are relatively strong regarding their efficiency as they can be conducted online which creates low costs for compensating participants and few resources for creating the materials and setting the survey up. By contrast, immersive behavioral paradigms are typically conducted as single sessions and as

lab-based studies. Therefore, the required resources (i.e., money, time) are arguably high for these paradigms or—viewed from the other angle—efficiency is weak for immersive behavioral paradigms. Similarly, economic games are usually conducted as laboratory studies and participants need to be paid a flat “show-up” fee plus additional money in order to make their monetary decision within the game truly consequential. However, economic games can often be conducted as group sessions (see Bartuli et al., 2016; Butler et al., 2020), which saves resources as compared to immersive behavioral paradigms. We therefore evaluate the efficiency criterion as mixed for economic games.

In order to substantiate our efficiency evaluation, we can review existing whistleblowing research with regard to their sample sizes: Efficient whistleblowing paradigms (i.e., scenario studies and autobiographical recall studies) should have recruited larger samples than less efficient paradigms (i.e., immersive behavioral paradigms). This was indeed mostly true for the studies reviewed in [Table 2](#).¹¹

Avoidance of Deception

Some of the reviewed whistleblowing paradigms require deceiving participants—for example about the actual purpose of the study or the role of the experimenter. This can be problematic from an ethical perspective because, according to the Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 2017), “psychologists do not conduct a study involving deception unless they have determined that the use of deceptive techniques is justified by the study’s significant prospective scientific, educational, or applied value and that effective nondeceptive alternative procedures are not feasible.” (p. 11). Among the four categories of whistleblowing paradigms, only immersive behavioral paradigms usually employ deception (i.e., the studies by Bocchiaro et al., 2012; and Miceli et al., 1991). In any case, whether or not whistleblowing research using immersive behavioral paradigms is likely to produce significant prospective scientific value, and whether or not nondeceptive alternative procedures (such as scenario studies, autobiographical recalls, or economic games) are feasible should be reviewed by an ethics committee and thoroughly justified in the corresponding manuscript (see Hilbig et al., 2022).

Taken together, there is no clear “champion” when it comes to whistleblowing paradigms: Each category of whistleblowing paradigms comes with individual strength and weaknesses with regard to its robustness against so-

⁹ We acknowledge that this comparison is not a perfect indicator of differences in robustness against socially desirable responding because these paradigms also differ in a variety of other properties. Nonetheless, we consider it to be useful (yet imperfect) first evidence in this regard.

¹⁰ The selection of studies for this comparison was pragmatic: We selected two studies per paradigm category based on availability of all necessary statistical information and whether the outcome measures were categorical rather than continuous (in order to validly distinguish whistleblowers from non-whistleblowers).

¹¹ We acknowledge that sample size is not a perfect (but an informative) indicator for differences in efficiency, for example because we do not know whether or not the studies had comparable resources (e.g., time and money) for their research endeavor.

Table 2. Comparison of Selected Whistleblowing Studies with Regard to Whistleblowing Rate, Sample Size, and Avoidance of Deception

	Whistleblowing Rate	Sample Size	Avoidance of Deception
Scenario Study			
Bocchiaro et al., 2012 (Scenario study)	64.50%	138	yes
Fischer, 2022 (Chapter 6)	87.71%	724	yes
Autobiographical Recall			
Dungan et al., 2019 (Study 1)	46.79%	3770	yes
Near et al., 2004	26.00%	1224	yes
Immersive Behavioral Paradigm			
Bocchiaro et al., 2012 (Laboratory study)	9.40%	149	no
Miceli et al., 1991 ^a	31.50%	295	no
Economic Game			
Bartuli et al., 2016	37.50%	88	yes
Butler et al., 2020 ^a	33.00%	471	yes

Note. Whistleblowing rates and sample sizes of these paradigms are only directly comparable if we focus on participants who observed a wrongdoing in the first place. This is because all participants in scenario studies are presented with a description of a wrongdoing and all participants in an immersive behavioral paradigm observe a (staged) wrongdoing, but not all participants in autobiographical recall studies have observed wrongdoings in real-life and participants in economic games only observe wrongdoing if another player decides to act unfairly. Thus, in order to enable a fair comparison, we report whistleblowing rates and sample sizes based on participants who observed a wrongdoing.

^a These studies included an experimental manipulation of certain features of the whistleblowing situation. As a result, whistleblowing rates differ substantially between conditions, but we focus on the overall whistleblowing rate here.

Table 3. Evaluation of Commonly-Used Whistleblowing Paradigms

	Robustness Against Socially Desirable Responding	Efficiency	Avoidance of Deception
Scenario Study	weaker	stronger	yes
Autobiographical Recall	mixed	stronger	yes
Immersive Behavioral Paradigm	stronger	weaker	no
Economic Game	stronger	mixed	yes

cially desirable responding, its efficiency, and whether or not it avoids deception (see Table 3 for a summary).

Recommendations for Future Research

Given that each of the four categories of whistleblowing paradigms comes with individual strength and weaknesses, we advocate to select and implement a whistleblowing paradigm that fits the specific research question one aims at. More specifically, if the prevalence of whistleblowing is of central interest, it is inevitable to implement a paradigm capturing actual *whistleblowing behavior* and not to rely on scenario studies measuring *whistleblowing intentions*. Moreover, in such a setting, an ideal whistleblowing paradigm should also be strong regarding its robustness against socially desirable responding; and we therefore advocate the implementation of immersive behavioral paradigms or economic games. By contrast, if the association of an independent variable (e.g., a personality trait) with whistleblowing is of central interest, scenario studies can provide a viable first approach. This is particularly true when the effect of interest is assumed to be rather small (for example, in personality research; see Gignac & Szodorai, 2016) and large

samples are consequently required. Nonetheless, effects of an independent variable on whistleblowing intentions derived from scenario studies should later be replicated with paradigms that assesses actual whistleblowing behavior.

A second recommendation for future research that we want to put forward is to conduct multi-method studies in the field of whistleblowing. This recommendation is warranted because the empirical convergence of the different whistleblowing paradigms has not yet been tested. Thus, we currently do not know how much variance the different whistleblowing paradigms share. A multi-method study in the field of whistleblowing should implement the four whistleblowing paradigms within the same sample. In order to decrease demand characteristics of such a procedure, we propose to make extensive use of filler tasks and to implement significant time intervals between the measurement occasions. Such a multi-method study would be particularly fruitful because all paradigms were designed to capture whistleblowing, but they do, in fact, emphasize different aspects of a whistleblowing situation. For example, modelling whistleblowing as an economic game is particularly suitable to model the *monetary costs* of a whistleblowing decision, but it can potentially less adequately model the

emotional consequences (e.g., being ostracized by one's colleagues, etc.) that are usually associated with whistleblowing (e.g., Gundlach et al., 2003; Peters et al., 2011; Rehg et al., 2008; Rothschild & Miethe, 1999). Moreover, a multi-method study would also help to quantify the so-called "intention-behavior gap" in whistleblowing research, that is the association of whistleblowing intentions with actual whistleblowing behavior (Bjørkelo & Bye, 2014). Finally, in order to obtain robust evidence that a certain variable (e.g., a personality trait) is related to whistleblowing, it is necessary to show that such an association not only exists in one single whistleblowing paradigm, but that it is generalizable to other paradigms modelling whistleblowing.

Conclusion

Drawing on Near & Miceli's well-established definition of whistleblowing (Near & Miceli, 1985), we have argued that scenario studies, autobiographical recall studies, immersive behavioral paradigms, and economic games are in principle suitable to capture the definitory features of whistleblowing. The selection of an ideal whistleblowing paradigm therefore requires a trade-off between different

qualities such as robustness against socially desirable responding, efficiency, and whether or not they avoid using deception. Future research will benefit from conducting multi-method studies in the field of whistleblowing.

Contributions

Substantial contributions to conception and design: MF
 Drafting the article or revising it critically for important intellectual content: MF, MG
 Final approval of the version to be published: MF, MG

Competing Interests

The authors declare that they have no competing interests.

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Supplementary Materials

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Table S1. Summary of Main Findings in the Reviewed Studies That Focused on Broad Personality Dimensions

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Figure S1. Illustration of Experimental Procedure of the “Whistleblowing Game” Developed by Butler et al. [y@239215]

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