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To cite this article: Petter Gottschalk & Cecilie Asting (2020): Crime Signal Detection Theory: Two Case Studies of the Five-Stage Model from Observer to Whistleblower, Deviant Behavior, DOI: [10.1080/01639625.2020.1816147](https://doi.org/10.1080/01639625.2020.1816147)

To link to this article: <https://doi.org/10.1080/01639625.2020.1816147>



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Published online: 02 Sep 2020.



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Crime Signal Detection Theory: Two Case Studies of the Five-Stage Model from Observer to Whistleblower

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ABSTRACT

The objective of this article is to present a study of two observers turning into whistleblowers through stages of crime signal detection, registration, interpretation, reception, and knowledge. The study applies signal detection theory emphasizing signal alertness, signal reflection, pattern recognition, and personal knowledge. The research method applied is personal interviews with the whistleblowers who noticed deviant behavior, one of which blew the whistle on corruption that later led to the incarceration of several corporate executives. Results indicate that the whistleblowers became more certain of their information as they could discuss their observations with others. An important human factor in whistleblowing is thus the ability to discuss initial observations with people that one can trust, which can lead to documented allegations against suspected individuals. The case studies illustrate experience from troublesome whistleblowing on top executives, where the second whistleblower was less successful.

ARTICLE HISTORY

Received 22 May 2020
Accepted 7 August 2020

Introduction

We define a whistleblower as a person who has been or is associated with the organization where observations occur, who notices actions or lack of actions that the person believes is misconduct, wrongdoing, or crime. Furthermore, the person is not directly harmed by the incident, and the person subsequently reports observations in a proper manner to another person or entity that should be capable of handling and solving the misconduct case. While most studies of whistleblowing focus on the role of whistleblowers (e.g., Bjørkelo et al. 2011; Craig and Piquero 2017; Johnson 2005; Keil et al. 2010; Lee and Fargher 2013; Mesmer-Magnus and Viswesvaran 2005; Mpho 2017; Rehg et al. 2009; Skivenes and Trygstad 2016), this study focuses on the quality of whistleblowing messages leading to potential actions by decision-makers.

We focus on behaviors and circumstances for whistleblowing to the extent they influence the core value of whistleblowing, which is development and communication of reliable information about perceived observations of potential misconduct, wrongdoing, and crime. We address in this article the whistleblower as an important source of potentially relevant information to decision-makers who can act on the information. The quality and reliability of information from whistleblowers is our concern, as receivers of information are dependent on a communicated understanding of the information turned into knowledge at the receiving end, so that receivers ideally can act on knowledge. Communication between sender and receiver loses value by factors such as the sender's misunderstandings and potential conspiracy theories and by the receiver's ignorance, reluctance, and rejection. According to signal detection theory, we distinguish between crime signals and noise signals, where noise can distort detection, registration, interpretation, reception, and knowledge of a crime signal (Szalma and Hancock 2013).

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This research is important, as it focuses on the steps of understanding and communication in whistleblowing (Bond 2008; Gomulya and Mishina 2017; Huff and Bodner 2013; Szalma and Hancock 2013; Wickens 2002; Wildman, Salas, and Scott 2014). We first apply a five-stage model to study the theoretical development of an individual from an observer to a whistleblower suggested by Gottschalk (2020), before we present two case studies of whistleblowers who noticed deviant behaviors (Braaten and Vaughn 2019; Dearden and Gottschalk 2020). The first whistleblowing led later to prison sentences for several executives in a transportation company in a Norwegian municipality, while the second whistleblowing had seemingly no consequences at all.

Signal detection theory

Signal detection theory is concerned with the ability of individuals to understand pieces of information that can come from various sources, and the ability of these individuals to make sense of information in communication with others. The theory emphasizes individuals' varying signal discrimination processes that mainly result from psychological factors. Discrimination processes include the sensitivity toward signals in general as well as the separation of real signals from noise signals.

The detection of a crime signal is dependent on the signal intensity and the signal alertness. The signal intensity represents the loudness, distinctiveness, and clearness of the signal from the sender. For example, a whistleblowing message can be loud and clear, but it can also be silent and confusing. The signal alertness is the readiness to detect a signal by the observer that can suffer from the observer's deviant mind-set, lack of interests, and misleading focus when the signal enters into transmission from the source to the observer.

Perceptual sensitivity is a key to signal alertness. As argued by Szalma and Hancock (2013), perceptual sensitivity is concerned with the ability of an observer to detect a signal and to discriminate signal from non-signal events. Observers have varying capability to distinguish between information-bearing recognition (called pattern) and random confusion that distracts from information (called noise).

When applying signal detection theory, researchers have suggested that observers more frequently and incorrectly notice negative messages stronger than positive messages (Liu, Ray, and Whinston 2010). Perceptions of negative task-related words can occur even without ever being part of a communicated message. Positive task-related words, on the other hand, may pass completely unnoticed and unobserved, although they might have reasonable signal intensity (Huff and Bodner 2013).

After signal intensity and signal alertness follow pattern recognition in signal detection theory. Gomulya and Mishina (2017) discuss pattern recognition in terms of the screening perspective where the receiver prioritizes his or her attention among large volumes of possible types of signals. The focus is on how the receiver places differential importance and thus value on signals that may come from various senders of signals such as documents, accounts, computer systems, and individuals. Without sufficient information in a noisy environment with many impressions not linked to any particular signal, it is indeed difficult to detect a crime signal, and it is even more difficult to feel certain enough to act on the signal (Wickens 2002).

Signal research model

We have developed a research model as illustrated in Figure 1 based on work by Gottschalk (2020). The model takes into account that there are stages of perception and understanding in crime signal detection and communication. First, there is a signal that an observer might detect, and the observer potentially registers the observation with a varying extent of confusion and uncertainty. If the observer interprets the signal as a misconduct signal rather than a noise signal, and if the observer decides to report the incident, then the observer changes his or her role to a whistleblower. Implicit in the role of a whistleblower is the perceived obligation to report the incident to someone responsible who can do

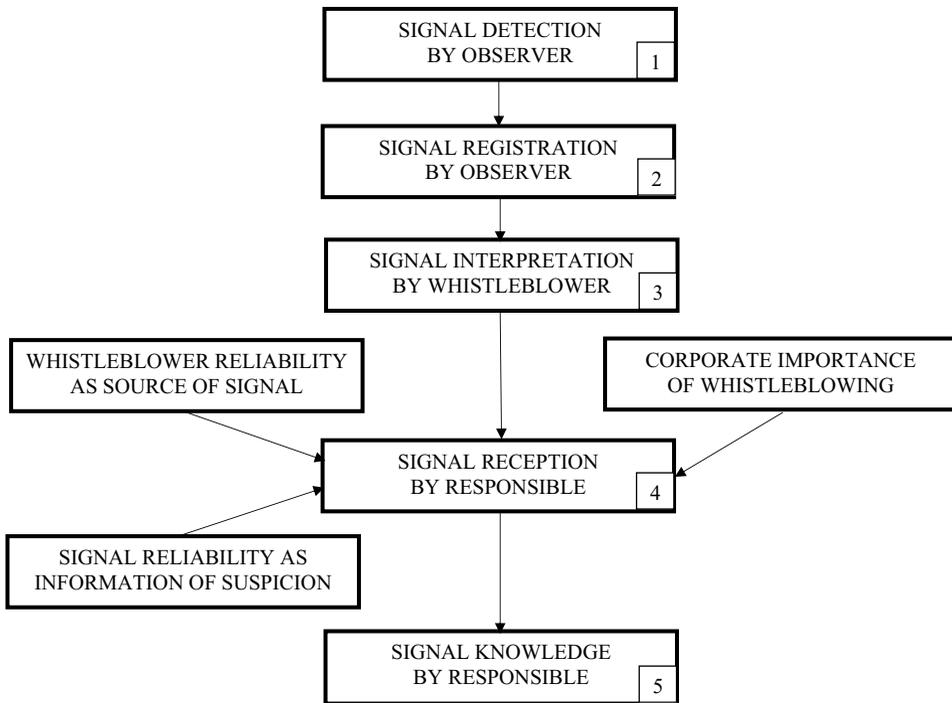


Figure 1. Determinants of whistleblowing receivers' knowledge from crime signals.

something about it. The responsible person as a receiver develops knowledge of the signal based on interpretation, reflection, and context. The extent of unbiased receptiveness at the receiver end depends on the receiver's view on the importance of whistleblowing messages relative to other task-related activities at the time of signal receipt, as well as the receiver's impression and judgment concerning source accountability and information reliability. The extent of convenience orientation at the receiver's end, where pain and strain is to be avoided, will also influence the receptiveness. A conveniently oriented receiver of negative and troublesome news might prefer to ignore the message and instead criticize the messenger which typically occurs in cases of retaliation and reprisals (Mesmer-Magnus and Viswesvaran 2005; Rehg et al. 2009; Rotchild and Miethel 1999).

In the following, we present each of the elements in the research model in Figure 1 in more detail.

Stage 1: signal detection by observer

Signal detection theory is a perspective on how humans detect signals with a background of interference, error, misunderstanding, and noise. The theory assumes that the human observer behaves like a rational economic decision-maker, and attempts to balance costs and benefits to arrive at an optimal solution in terms of whether or not to ignore or take notice of the signal (Karim and Siegel 1998). For example, while journalists in the media have the advantage of listening to strong signals from people who have observed wrongdoing, clerks at the internal revenue service have the disadvantage of listening to weak signals or no signals at all from people who commit tax evasion. While informants want the attention of the media by providing strong signals to investigative journalists, fraudsters want to avoid the attention of the revenue service and the police force.

Stage 2: signal registration by observer

According to signal detection theory, there are a number of determinants of how a person will detect a signal. In addition to signal intensity, signal alertness as well as pattern recognition, there are other factors such as personal competence (including knowledge, skills, and attitude), experience, and expectations (Szalma and Hancock 2013). While police detectives have systems to register tips in computer systems, people who have never experienced misconduct observations may try to rely on their own memory. Typically, an observer is new to the situation. While a signal might have made an impression on the observer, the observer has no systematic approach to register observations. Frequently, the observer only registers in the personal memory some random pieces of information about an incident rather than the whole event or sequence of events.

Stage 3: signal interpretation by whistleblower

Signal interpretation is concerned with the extent of understanding of incidents. Whistleblowers can be in doubt regarding incidents that they have observed. They can misunderstand the context in which observations occur (Gomulya and Mishina 2017). Their reflections can lead them to a distorted picture of events and thereby end up with a wrong conclusion about an incident. Some whistleblowers may be too certain, while others may be too uncertain regarding the observation that has occurred. Pieces of information may or may not fit into a puzzle that can represent a misconduct or crime picture. Later events can be interpreted in the context of earlier events to simply confirm an impression rather than to challenge an established impression. The observer may select pieces of new information that fit the impression already established rather than to revise and update the impression by application of deviant information.

Stage 4: signal reception by responsible

The quality of signals from a whistleblower to a responsible person or unit will vary. Some whistleblowers report incidents in a factual manner, while others include conspiracy theories about the matter. The receiver of a message from a whistleblower will consider both the information and the source. If communicated pieces of information are fragmented, and the person as a source has been unreliable on previous occasions, then signal reception will be low. When there is a professional receiver, such as a police officer, then informant messages are classified systematically: confirmed by other sources, probably correct information, possibly correct information, questionable information piece, unlikely information piece, and accuracy cannot be assessed (Police 2014). Similarly, the informant might be a completely reliable source, a usually reliable source, a quite reliable source, a usually not reliable source, a not reliable source, or reliability cannot be assessed. However, most executives and others who are at the receiving end of messages from whistleblowers have no experience in handling neither whistleblowing messages nor whistleblowers. Just like observers, receivers can misunderstand the context in which incidents have occurred. Their reflections can lead them to a distorted picture of events and thereby end up with a wrong conclusion about an incident. Some receivers may be too certain where to allocate the story, while others may be too uncertain regarding the story being told (Skivenes and Trygstad 2016). Pieces of information may or may not fit into a puzzle that can represent a misconduct or crime picture. Later whistleblowing messages can be interpreted in the context of earlier messages to simply confirm an impression rather than to challenge an established impression. The receiver may select pieces of new information that fit the impression already established rather than to revise and update the impression by application of deviant information.

Stage 5: signal knowledge by responsible

Knowledge is information combined with interpretation, reflection, and context that creates understanding in the heads of individuals. Some messages from whistleblowers are easy to understand, easy

to put into context, and thus easy to transform into knowledge in the heads of receivers. Some messages are so comprehensive that the receiver is able to study evidence of alerts if the time allows. Some whistleblowers are open-minded and communicative so it is easy to relate to them for further insights. Some whistleblowers are willing to contribute reflection about an incident, thereby helping the receiver develop relevant knowledge. However, since whistleblowing is a risky activity where whistleblowers want to protect themselves, many messages are difficult to understand, impossible to put into context, and thus hard to transform into knowledge in the heads of receivers. Many whistleblowers are afraid of exposing themselves by avoiding direct contact with receivers for further insights (Rehg et al. 2009). Receivers can thus end up in a situation with many questions and few answers. Some whistleblowers stay away from interfering in the processing of their own alerts, while others intervene and create confusion and frustration, thereby reducing the level of awareness and knowledge.

Case study Skog

In the public transportation company Unibuss, observer and later whistleblower Jan Erik Skog repeatedly communicated information on incidents and events that he had observed. After many years, the Unibuss case ended with court convictions and incarceration of 10 executives for corruption. It was more than a decade after the first notice and warning from Skog (Slettholm 2016). Final terms of punishment were determined in the Norwegian Supreme Court for three of the convicted (NTB 2016). The Unibuss case is one of the larger legal proceedings against corruption in Norway (Folkvord 2015; Fritt ord 2015; Mortensen and Grimsrud 2016; NTB 2014; Tømmerås 2014).

Skog worked as an electrician at Unibuss, a public bus company located in Oslo, the capital of Norway. He was also a craft union representative. Skog had reactions when there were deviations from procurement routines, in terms of unnecessarily high prices paid and only one supplier. Initially, Skog informally communicated his concerns, but there was no reaction. Then, he started to document his allegations (Tømmerås 2014).

Rather than the traditional perspective on his experience as a whistleblower generally (e.g., Bjørkelo et al. 2011; Skivenes and Trygstad 2016), our perspective in the interview was Skog's perception of himself as a reliable or unreliable information source in noticing, understanding, and reporting his suspicion of white-collar crime (Craig and Piquero 2017; Gottschalk 2020; Piquero, Schoepfer, and Langton 2010; Sutherland 1939). The following text is his words about each stage as he remembered them when we interviewed him.

Stage 1: signal detection by observer

I was definitely sure about my observations right away. A new procurement manager was hired, but we knew him from before. You had to count your fingers after shaking his hand. The manager told us that buying as cheap as possible was no more an issue. He demanded to have his people in, his network should deliver, the price was not important. I thought it was crime right away. I am always suspicious and skeptical, and I never accept what executives tell me is the truth about any situation. I draw my own conclusion. I see patterns and notice things that others do not recognize.

Stage 2: signal registration by observer

I was a union representative on the board, but I worked on the floor. My fellow union members believed me, and they joined me in my thoughts. Without the union, I would be lost. We became especially suspicious toward the new procurement manager, when we learned that he had to leave a similar position in a different company some years ago. I got up in the middle of the night to make notes, and I could hardly sleep afterward. All accusations could be documented, anyone could see it,

but we were uncertain how it could be exposed. I made notes when the procurement manager got a new private car from a vendor, who was our main supplier of tires for our busses.

Stage 3: signal interpretation by whistleblower

I was rational and wrote a report about my observations. I discussed it with other union members and colleagues. I also discussed it with a left-wing politician who had discovered corruption in the municipality in the past. My signal awareness was strong, based on my experience in the organization for many years. I considered myself qualified to identify patterns in criminal activities. I had never blown the whistle before. Nobody else wanted to talk loud about it, maybe because surprisingly many of my colleagues had minor fringe benefits that they were reluctant to give up.

Stage 4: signal reception by responsible

The chief executive called me to a meeting, where another executive also was present. I told the corruption story, but they did not want to believe it. Instead, they presented all kinds of reasons why what I had observed was quite normal, and that I had obviously misunderstood what was going on. The meeting lasted for an hour. I had raised several issues, but they were all ignored. I went on to notify the chairperson on the board. He simply said that we should all be friends and look ahead. I had no idea that the chief executive later was to be convicted of corruption in court, together with a number of other business executives at Unibuss. He had tried to silence me. At one point, the chief executive discovered that I had communicated an allegation that was not completely true. He required that I should regret my allegation in writing. So I did, and he said he hoped I had learned a lesson.

Stage 5: signal knowledge by responsible

The chief executive was extremely good at talking, everyone on the board listened to him. Almost hallelujah every time he was speaking. Board members made me look like a fool when I presented my critical comments at board meetings as a union representative. However, the ice really broke when a journalist reported in the media about a court case in Germany involving bus manufacturer MAN and the Norwegian customer Unibuss. Then, the snowball really started to roll very fast. People were arrested, and I was exposed in the media as a whistleblower for the first time.

Case study Ødegård

The culture house conflicts in Voss municipality in Norway had cost the local community more than two million Norwegian kroner (about USD 200.000) and more over four million NOK in total for cultural projects (Birkeland 2016). Sandnes (2020: 2) wrote in the local newspaper Hordaland:

These days, the seventh boss will start in nine years at Voss Kulturhus. The conflicts at the cultural center cost Voss municipality millions. Voss has inherited costs from the conflict of just over 1.2 million kroner per year. Hordaland has asked for access to the costs of legal aid, consultancy assistance, severance packages and other direct costs Voss municipality had associated with the conflicts. The calculation of the councilor shows that Voss municipality spent more than NOK 2.3 million in such costs. In addition, there are ongoing costs for 1 1/2 person-years created by the municipality for persons who have been involved in the conflict.

There have been two whistleblowing cases in recent years at Voss Culture House. In September 2016, the safety representative at the cultural center sent a notice to the then head of culture and leisure, where he accused the person in question for harassing and unduly hiring. The warning also made it clear that the employees at the cultural center had no confidence in the municipal manager as a tenant,

and that they saw the person as an important part of the conflict that had arisen. The then head of culture was not among the alerts.

The notification triggered the municipality to say that they had an obligation to investigate, as described in section 2–1 of the Working Environment Act. Councilor Einar Hauge brought in external expertise to conduct a factual investigation into the case.

The external investigators revealed fundamental collaboration problems in the culture house at Voss. The whistleblower was Jonas Vedde Ødegård, who had responsibilities within the marketing of culture events and was the main union representative (Kvamsdal 2017).

Stage 1: signal detection by observer

Quite early after I was hired in 2011, in a newly created position, maybe two or three months later, it did simply not work, the system didn't work. Nobody knew who did what, the kind of municipal department it was, who invoices, receives phone calls, e-mails and all such administrative stuff. The culture director stayed there briefly for about six months. The culture house was supposed to be self-financed, but how could it be when no one sent an invoice. It had cost 100 million NOK (about 11 USD million) to build the house, but the organizational structure did not work, so nothing really happened. Politicians were happy though, so in the first six months, nobody reached out to help. A disclaimer of responsibility, as the municipal head of culture, the municipal executive, as well as the mayor were all informed. We had to work twice as hard to get to the finish line. We attracted customers and provided technical support. I had worked in the municipality before with music and children and young people, but returning to the municipality was quite a surprise to me.

Finally, we got things in order, very much thanks to a new culture house manager. He expressed confidence in us.

Stage 2: signal registration by observer

I kept a lot to myself for the first 6 months. I was new and you won't win by telling such things. I talked with my mate and professional actors in the other end of the business, such as technicians. Maybe I misunderstood, but I don't think so.

Stage 3: signal interpretation by whistleblower

I blew the whistle together with my colleague Anette Hansen by sending the following e-mail message with the subject "Notice of harassment and undue leadership" to the HR manager in Voss municipality:

On request from the head of human resources in the municipality of Voss, I would like to make explicit what I sent in my first memo to the councilor on September 9, 2016 at 09:15. In the memo, I asked that a factual inquiry be initiated, because there are several reports of incidents where municipal manager Gunnhild Utkvitne commits harassment and undue leadership. As explained in more detail in the memo, the municipal manager is an important cause of the poor working environment in the cultural center. And she can't be the one to manage to work on improving it.

The whistleblowing message is very long, exactly 1873 words. It starts by listing a number of harassment episodes. Then it continues with the alcohol problem:

Employees at the cultural center have, on many occasions, observed the municipal manager very intoxicated by alcohol. Several employees have received phone calls and sms messages in the middle of the night where she seems quite drunk. Employees in other municipalities have contacted employees at the cultural center and complained about Utkvitne's behavior in an alcohol-affected state. Several of them have told that Utkvitne during alcohol intoxication has told details about employments of others. She has also provided personal information about employees at such occasions. On several occasions, Utkvitne smelled strongly of alcohol the morning after

ceremonies and events, although she was at work for and represented Voss municipality. Employees have on several occasions been harassed at ceremonies and events where Utkvitne was visibly affected by alcohol.

Several of the employees at the cultural center have quit participating in travel and at events with Utkvitne as they are uncertain about how Utkvitne's behavior might be. This kind of information weakens our trust in the municipal manager and creates uncertainty about her leadership abilities. The employees argue that this information is indeed known to the local authority, since many other municipal leaders have been present when such events have taken place.

The whistleblowing message draws the following conclusion:

The claims in this notice are serious. The claims can be documented partly in writing and partly if one interviews present and former employees. In my opinion, it may also be relevant to interview people in other municipalities (who, for example, have experienced Utkvitne under the influence of alcohol).

The routines at the municipality of Voss indicate that by whistleblowing, a fact examination must be carried out, and that what is being complained about must be given the opportunity to respond. The guidelines of the municipality of Voss, as well as the Working Environment Act, say that the safety representative should have a role in the efforts to improve the working environment.

Stage 4: signal reception by responsible

As indicated by whistleblower Ødegård above, the municipality had to respond by conducting an investigation into the allegations against Utkvitne. The mayor at Voss hired in December 2016 attorney Harald Pedersen to conduct an investigation into allegations concerning harassment and drunken behavior against municipal manager Gunnhild Utkvitne. Pedersen (2017: 33) submitted his report to the mayor in February 2017, where concludes that no violation of the Working Environment Act has occurred:

As can be seen from the above review, I have come to the conclusion that there is no violation of the Working Environment Act in this case, and that the employer's duty of activity is thus not triggered.

Stage 5: signal knowledge by responsible

In the small town of Voss, the report by Pedersen (2017) created a number of reactions. First, the mayor seemed happy with the conclusion as he did not have to intervene in a complicated case. Next, the whistleblowers were frustrated that Pedersen's conclusion was considered the objective truth about the matters reported. Finally, the local media did not consider the case closed, so journalists continued to investigate the case for several years (e.g., Sandnes 2020).

Discussion

Why does it seem so hard for whistleblowers to get their messages recognized and interpreted by responsible decision-makers? Signal detection theory is, according to Karim and Siegel (1998), based on the assumption of a rational decision-maker model. In our first case, Skog claimed to be rational in writing about his observations, and the receivers of his messages were kind of rational as well, since they turned out to be involved in crime. The Ødegård case reveals mistrust in the leader and the leadership in the municipality. Mistrust is far from rational and perhaps claiming to be rational is not the same as being rational? Studies of judgment under uncertain conditions indicate that people are often overconfident (Brenner et al. 1996). Overconfidence from a whistleblower on one side and the recipient on the other side might be a potential explanation for why a message can be differently understood. The relationship between leader and member or follower might also be part of the whistleblower feeling misinterpreted. The leader-member exchange (LMX) perspective (Hooper and Martin 2008) emphasizes how leaders develop different qualities in their relationship with

employees, being of a more or less favorable kind. A good relationship is a trusted connection between leader and member, whilst an untrusted relationship might trigger questions about the leader and his or her integrity (Hooper and Martin 2008).

Listening to subordinates and coming to a somewhat similar interpretation as the whistleblower, seeing or agreeing upon observations of deviant behavior in the organization, may require an ethical leader or ethical leadership. Bhal and Dadhich (2011) describe ethical leadership as an attribute of the leader in contrast to being part of a special type of leadership. Therefore, ethical leaders can perform with both transactional and transformational leadership. Ethical leadership consists of three parts: the leader shows ethical behavior, the leader serves as a role model in the organization, and he or she supports subordinates' ethical conduct. Ethical leadership is supposed to decrease the risk for the subordinate of perceiving revenged if he or she decides to blow the whistle (Bhal and Dadhich 2011). Neither the Skog case nor the Ødegård case describes any signs of ethical leadership, thus explaining a part of their difficulties in being trustworthy and supportable when informing their leaders.

We have in this research ignored the context in which whistleblowing occurs, because it has been explored extensively in the past (Bjørkelo et al. 2011; Brown, Hays, and Stuebs 2016; Johnson 2005; Keil et al. 2010; Lee and Fargher 2013; Mesmer-Magnus and Viswesvaran 2005; Mpho 2017; Rehg et al. 2009; Skivenes and Trygstad 2016). Rather, we interviewed two well-known whistleblowers in Norway in terms of their own perceptions of being information sources. Whistleblower Skog's perception of himself is that he was "absolutely sure right away." Similarly, whistleblower Ødegård was convinced of his observation of harassment and drunken leadership.

Conclusion

Our interviewed whistleblowers lack all characteristics of the follower type who would typically not blow the whistle. Followers are fascinated by the boss's personal charisma (Aguilera and Vadera 2008; Fanelli and Misangyi 2006; Glasø and Einarsen 2008). The whistleblowers Skog and Ødegård show little sign of obedience (Baird and Zelin 2009) or sign of self-control preventing involvement in trouble (Piquero, Schoepfer, and Langton 2010). In contrast, followers want to avoid the consequences of the dark sides of their leaders (Glasø, Ståle Einarsen, and Matthiesen 2010).

We have to admit that an obvious shortcoming of the study is the single-source approach. The signaling theory presented in this article relates to senders and receivers, but in having only a single data source, the two sides of this relation never become effectively explored in the empirics. Future research needs to focus on a broader case study of an incident that does not just rely on one source but builds an understanding of the signals sent and received, or not, across a whole range of actors. Future research needs to cast the empirical net much wider by starting with interviews of both a sender and a receiver of information regarding misconduct, wrongdoing, and crime.

Notes on contributors

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Cecilie Asting is a lecturer in the department of leadership and organizational behavior at BI Norwegian Business School in Oslo, Norway. She has experience from business life in several private companies before she started lecturing on different subjects within the area of organization and leadership. Asting has specifically developed approaches to the application of technology and media to improve teaching in higher education.

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