



Drivers' social-work relationships as antecedents of unsafe driving: A social network perspective



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ARTICLE INFO

Keywords:

Social network
Safety
Unsafe driving
Negative relationship network
Advice network
Friendship network

ABSTRACT

In order to reduce road accidents rates, studies around the globe have attempted to shed light on the antecedents for unsafe road behaviors. The aim of the current research is to contribute to this literature by offering a new organizational antecedent of driver's unsafe behavior: The driver's relationships with his or her peers, as reflected in three types of social networks: negative relationships network, friendship networks and advice networks (safety consulting). We hypothesized that a driver's position in negative relationship networks, friendship networks, and advice networks will predict unsafe driving. Additionally, we hypothesized the existence of mutual influences among the driver's positions in these various networks, and suggested that the driver's positions interact to predict unsafe driving behaviors. The research included 83 professional drivers from four different organizations. Driving behavior data were gathered via the IVDR (In-Vehicle Data Recorder) system, installed in every truck to measure and record the driver's behavior. The findings indicated that the drivers' position in the team networks predicts safe driving behavior: Centrality in negative relationship networks is positively related to unsafe driving, and centrality in friendship networks is negatively related to unsafe driving, while centrality in advice networks is not related to unsafe driving. Furthermore, we found an interaction effect between negative network centrality and centrality in friendship networks. The relation between negative networks and unsafe behavior is weaker when high levels of friendship network centrality exist. The implications will be presented in the Discussion section.

1. Introduction

According to the World Health Organization, the annual worldwide road accident death toll is 1.25 million people. Traffic accidents are a major cause of death among young people aged 15–29 (World Health Organization, 2016). Researchers claim that 90%–95% of all road accidents are caused by driver behavior (Constantinou et al., 2011). Previous research studies that attempted to identify the antecedents of drivers' unsafe behavior have mainly focused on drivers' demographic characteristics such as gender or age (González-Iglesias et al., 2012; Rhodes and Pivik, 2011); drivers' personality and emotional state (Clarke and Robertson, 2005; Dahlen and White, 2006). Other studies focused on the manager's influence on drivers' safe behavior (Newnam and Oxley, 2016). However, to the best of our knowledge, previous researchers have not examined the possible effect of the driver's peers as an influencing factor on safe driving behavior on the road. Hence, our study contributes to the literature by introducing a social network approach that can capture social relationships and test them with objective measures of driving behaviors.

Human behavior cannot be isolated from the environment in which the individual operates (Bandura, 1977). In other words, individuals' social environments may shape their attitudes and behavior. Various theories have been developed over the years, indicating the importance of the social process in the creation of cognitive structures that shape behaviors. For example: sense making (Blumer, 1969; Weick, 1995), processes demonstrate that social interactions provide an interpretation of events and shape attitudes (Deutsch and Gerard, 1955; Salancik and Pfeffer, 1978). If this is indeed the case, it is likely that peers in the organizational unit may affect employee behavior. However, it can be also assumed that individuals are influenced differently by different peers. In addition, there are different types of relationships, each of which has different effects, arising from the nature of the social relationship. Therefore, it is important to examine the complexity of an individual's relationships with his or her team members and work colleagues, and their effects on safe driving behaviors.

Safety studies have shown the existence of social mechanisms in organizations, and identified leaders (Zohar, 2002; Zohar and Luria, 2004), and peers as a source of influence related to safe behavior

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(Goldberg et al., 1991; Simard and Marchand, 1997; Westaby and Lowe, 2005) and on the rate of workplace injuries (Iverson and Erwin, 1997; Oliver et al., 2002; Turner et al., 2010; Yagil and Luria, 2010). Presumably, the types of social relationships that individuals create with peers form channels of influence on behavior, thereby helping individuals to form safe behavior attitudes and habits. This research, using network analysis, examines how different types of relationships among peers affect the safe driving behavior of professional drivers.

To the best of our knowledge, in the area of safety research only one study was conducted that examines the impact of different types of relationships in the team on safety, by using network analysis (Zohar and Tenne-Gazit, 2008). However, this study focused on the team level, and did not refer specifically to driving. Furthermore, Zohar and Tenne-Gazit focused on climate strength creation, via leadership, and discuss positive networks (friendship networks, and communication networks). The current research focuses on the individual level, and attempts to examine the role of complex relationships between individuals and their work colleagues, and their influence on drivers' safety behavior using three different networks (friendship, advice and negative relationship networks).

2. Literature review

2.1. Social impact on the individual's behavior

Social influence is defined as changes in the psychological attitude, subjective feelings, motives, emotions, cognition, beliefs, values, and behavior, which occur in the individual, as a result of another's real, implied or imagined action (Latane, 1981). From birth, we learn that other peoples' conceptions, as well as their attitudes, constitute a reliable source of one's perception of reality (Deutsch and Gerard, 1955). Since the mid-20th century, researchers have found that people tend to change their attitudes, as a result of social influence (Asch, 1951; Sherif, 1935). In organizational settings, social influence may be attributed to the team's leader or to peers, and the social influence mechanism may be explained by an approach called "Symbolic Interaction" (Blumer, 1969).

Symbolic Interaction, from which the "sense-making" mechanism was later developed (Weick, 1995), claimed that one's perception of reality is created through the process of cognitive exchanges among people who want to interpret their environment (Zohar, 2010). In other words, the interpretation of events is created through the interplay between an individual's perception and the perceptions of others in the same situation. As a result of interactions with others, individuals continuously reassess their perceptions (Blumer, 1969; Luria, 2008; Schneider and Reichers, 1983; Zohar, 2010) by comparing information and hints, discussing possible interpretations, and through the desire to create a consensus about shared meanings of work-related events, processes and procedures (Zohar, 2010). *Interpersonal communication* also plays an important role in creating meaning, which influences individuals' behavior (Weick et al., 2005). For example, communication with the manager may help employees to understand the priorities of organizational goals, such as safety and productivity (Zohar, 2010).

In a same way, we assume that creating meaning, as a result of a social process which contains interpersonal communication among peers, can change priorities and may shape employees' behavior. We claim that while interpersonal communication with peers may shape attitudes and behavior, peer influence is not uniform. In other words: each employee has a different kind of relationship with various peers, which may have different influences on his or her attitudes and behavior. This claim is aligned with Deutsch and Gerard's (1955) arguments that people are more influenced by their in-group peers, compared to people who do not belong to their immediate group. The explanation for this, according to researchers, lies in the existence of two parallel processes: first, *informational social influence*, defined as receiving information from others in the group and perceiving it as evidence of

reality. The second process, *normative social influence*, is defined as the need to behave according to the expectations of others (Deutsch and Gerard, 1955), Social influence theory (Deutsch and Gerard, 1955), symbolic interaction approaches (Blumer, 1969), and the creation of sense-making (Weick, 1995) may be mechanisms which explain employees' behavior. In the current study, we aim to identify the channels in which social influence passes from one group member to the other, according to the social network approach.

2.2. Social impact on safe behavior

Various prior studies have established a connection between peer relationships and team safe behavior (Goldberger et al., 1991; Simard and Marchand, 1997; Westaby and Lowe, 2005) or rate of injuries and accidents at work (Iverson and Erwin, 1997; Oliver et al., 2002; Turner et al., 2010; Yagil and Luria, 2010). These studies establish a foundation for the claim that peers may affect individuals' safety related behavior. However, the reference in these studies to peers' influence is uniform. That is, the researchers assumed that each team member has the same influence on each individual's behavior. We approach the issue in a different manner; based on the social network approach, we assume that individuals form complex relationships of various types with their peers. These relationships may have a different effect on each individual's attitudes and accessibility to information and, therefore, on each individual's driving behavior.

Social network research found that social relationships between people may contain different content (Contractor et al., 2006; Katz et al., 2004). The network literature distinguishes between instrumental ties and expressive ties (Ibarra, 1993; Luria and Kalish, 2013; Schulte et al., 2012). *Instrumental ties* (in the work context) are channels of work-related advice and information relevant to task completion; *expressive ties* are affect-laden ties that may be positive or negative (Schulte et al., 2012). In order to identify which ties serve as channels of influence regarding safety behavior, in line with Schulte et al. suggestion (2012), we used an advice network to measure instrumental ties and both a friendship network and negative relations to measure expressive ties.

Advice network, defined as a set of relationships through which people share resources (such as information, assistance and training), relates to the completion of work-related tasks (Sparrowe et al., 2001; Zagenczyk and Murrell, 2009). According to researchers, advice networking has several distinct advantages over others ties (Cross et al., 2001). Advice ties enable individuals to leverage the experience of their peers, in order to increase their performance (Balkundi and Harrison, 2006; Schulte et al., 2012).

Friendship network, defined as a network that contains ties based on a sense of affection towards others, and provides individuals with emotional and social support (Schulte et al., 2012). Other expressive ties are negative ties. *Negative relationships* are less common than friendship ties, constituting between 1% and 8% of organizational relationships (Gersick et al., 2000; Labianca et al., 1998). These kinds of relationships derive from a set of judgmental feelings and negative interactions with another (Labianca and Brass, 2006), and contain repetitive feelings of discomfort or annoyance in regard to others (Schulte et al., 2012), and develop between two people who share a work relationship, in which for one reason or another, at least one of them does not like the other. Scholars have claimed that negative relationships have a powerful predictive ability on workplace outcomes, compared to positive relationships, and they may be more powerful than positive ties (Granovetter, 1973, 1983; Labianca et al., 1998; Labianca and Brass, 2006). According to Labianca et al. (1998), it is especially important to analyze negative relationships in the organization because these relationships hinder necessary interactions within the organization.

Our research focuses on all three types of relationships, and discusses the issue of how the individual's position (i.e., centrality) in each network, separately and together, affects an employee's driving

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