

Seeing Words as if Seeing the Person: The Effect of Virtual Communication Style on Leadership Emergence

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Abstract

With the digitalization and intelligence of enterprise operations and the platformization of management, emergent leadership among employees has gradually become a key force underpinning organizations. Consequently, the mechanisms of leadership emergence in online work contexts have emerged as an urgent issue requiring investigation. Current research on leadership emergence has primarily been conducted in traditional settings. However, online contexts differ significantly from traditional ones, with substantially different modes of interactive communication. This study therefore analyzes the mechanisms of leadership emergence in online work teams from the perspective of virtual communication styles. The study first employs grounded theory to explore features imbued with leadership connotations in virtual communication. Based on structural theory of communication styles, these features are categorized into identity characteristics, channel characteristics, and interaction characteristics of virtual communication. Subsequently, this paper analyzes identity system characteristics through the lens of leader identity construction theory, examines channel characteristics using a pattern-oriented approach, and characterizes interaction characteristics from a social network perspective, to investigate the mechanisms by which these features influence leadership emergence in online work teams. This study expands the theoretical implications of leadership emergence and provides scientific evidence for how enterprises can effectively leverage digital media for management communication.

Full Text

The Effect of Virtual Communication Styles on Leadership Emergence

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Abstract: As organizational management becomes increasingly digitalized and platform-based, emergent leadership among employees has become a critical force supporting organizational operations. Consequently, understanding the mechanisms of leadership emergence in online work teams represents an urgent challenge for contemporary management practice. While existing research has primarily examined leadership emergence in traditional face-to-face contexts, online work environments differ substantially from conventional settings, with fundamentally distinct patterns of interactive communication. This study therefore analyzes leadership emergence mechanisms in online work teams through the lens of virtual communication styles. Using grounded theory, we first explore the features of virtual communication that signal leadership potential. Grounded in the structural theory of communication styles, we categorize these features into identity characteristics, channel characteristics, and interaction characteristics of virtual communication. We then examine how these characteristics influence leadership emergence in online work teams by analyzing identity system features through leader identity construction theory, investigating channel characteristics using a person-centered approach, and characterizing interaction features from a social network perspective. This research expands the theoretical understanding of leadership emergence and provides a scientific foundation for organizations to leverage digital media for effective management communication.

Keywords: leadership emergence, virtual communication style, identity characteristics, channel characteristics, interaction characteristics

1. Problem Statement

Recent transformations driven by digital information and intelligent technologies—such as mobile internet, big data, and artificial intelligence—have ushered organizational management into the “digital-intelligence era” (Chen Dongmei et al., 2020). These technologies have permeated all aspects of organizational operations, reshaping organizational models and making online work the predominant mode of collaboration. The impact of special circumstances like the pandemic has further accelerated this trend (Chamakiotis

et al., 2021). Online work breaks through temporal and spatial constraints of traditional work models, enabling employees to rapidly establish work platforms through digital media (Trichas & Schyns, 2012; Signorello et al., 2020). This grants employees greater autonomy and decision-making authority. However, the dispersion of employees across time and space increases task coordination difficulty, while relative isolation among employees demands greater support from leaders. In this context, leadership becomes more critical, yet the influence of traditional vertical leadership is weakened because vertical authority is difficult to establish in online work environments (Purvanova & Bono, 2009). Horizontal leadership has become a key facilitating force for effective team functioning (Badura et al., 2021). Therefore, enhancing employee leadership emergence—the exhibition of informal, lateral leadership (Hanna et al., 2021)—is crucial for organizational digital-intelligence transformation. Given these profound changes in management practice, understanding the mechanisms and influencing factors of leadership emergence in online work teams has become an important research priority.

Leadership emergence emphasizes the process by which individual team members exhibit leadership qualities (Hao Po et al., 2017). As organizations in the digital-intelligence era must respond to massive volumes of diversified information, top-down vertical leadership models face severe challenges (Buzaglo & Wheelan, 1999), making leadership emergence as a complement to formal leadership increasingly salient (e.g., Wellman et al., 2019; Zhang et al., 2012). Existing literature on leadership emergence mechanisms has predominantly adopted a trait perspective, examining which personality characteristics facilitate leadership emergence (Badura et al., 2021). Traditional work contexts with shared social situations and rich nonverbal cues facilitate the expression and perception of personality traits. However, digital media tends toward depersonalization, making trait expression and perception more difficult. Consequently, a trait perspective struggles to capture the core features of leadership emergence in online work contexts (Walther, 2011). In online work environments, nonverbal communication—including facial expressions and vocal tone—is severely restricted, requiring individuals to convey information, emotions, and intentions through language and visual expressions (Trichas et al., 2016). Communication style reflects individuals' unique choices in language and visual expression, becoming particularly important in virtual communication environments where personalized information is relatively scarce (Charlier et al., 2016). Moreover, communication in online work contexts serves not only to exchange information but also to fulfill emotional transmission and situational construction functions—for instance, setting up virtual avatars, establishing group chats for specific topics, and sending emojis or stickers to enliven the atmosphere (Brucks & Levav, 2022). The widespread and diverse applications of virtual communication features make communication styles more readily perceptible in online work contexts (Loyless, 2023).

In summary, we argue that virtual communication style represents a salient personal characteristic in online work contexts that plays a key role in leadership

emergence. Leadership and communication are intrinsically connected (De Vries et al., 2010), with scholars suggesting that leadership essentially resides in communication (Pondy, 1989; Fairhurst, 2008). Therefore, we propose that virtual communication style can shape employee leadership emergence. Communication style refers to the specific manner of information presentation, transmission, and feedback during interactions among online work team members—for example, using ambiguous wording (“maybe,” “seems,” “approximately”) or providing immediate responses (Ziano & Wang, 2021). Beyond formal differences, communication style also exhibits content-related features such as frequent topic shifting, emotionally intense language, and clarity of expression (Choudhury et al., 2019). The widespread use of digital media has greatly expanded the diversity of communication styles, generating many new features. Examples include text expressions mimicking vocal emphasis (“You are amaaaaazing!”), internet slang (such as “overwhelmed” or “lying flat”), choices between text and voice messages, and responses ranging from quick replies to “read but not replied.” Communication software continuously develops new functions such as gesture symbols for handshakes or hugs, emojis, and animated expressions. Employees may generate leader-like influence through specific communication styles (Iyengar et al., 2011). Moreover, online interactions typically leave records that can be reviewed repeatedly, potentially reinforcing the effects of virtual communication styles. Synthesizing these considerations, this study examines the mechanisms through which virtual communication style influences leadership emergence in online work contexts, providing guidance for effective online communication management and valuable insights for employee leadership emergence.

2.1 Leadership Emergence

Although conceptualizations of leadership emergence vary across domains and cultural contexts (Zhao Xinyu et al., 2014), they commonly involve individuals without formal leadership positions being perceived by others as possessing leader-like influence (Judge et al., 2002; Lanaj & Hollenbeck, 2015). Leadership emergence differs from formal leadership in two fundamental ways. First, formal leaders remain relatively stable over extended periods and across team stages, whereas leadership emergence is rooted in others’ perceptions, with many contextual factors influencing who is perceived as a leader and for how long—a relatively dynamic process. Second, formal leadership represents an explicitly appointed role identity emphasizing task control and hierarchical, top-down leadership (Hu Qiongjing et al., 2021), while leadership emergence involves being perceived as a leader, existing in others’ cognition, with the leader role being conferred by others. Although most management research on leadership emergence has been conducted in temporary, self-managed, or leaderless contexts, some studies assume leadership emergence applies only to situations without formal leaders (Acton et al., 2019). However, in management practice, leadership emergence is closely related to formal leadership and may even be actively facilitated by formal leaders—for instance, when formal leaders delegate leader-

ship authority to specific subordinates, increasing their likelihood of leadership emergence.

Current research on leadership emergence primarily examines what types of individuals are more likely to emerge as leaders, focusing on four categories of antecedents: demographic characteristics, personality traits, abilities, and motivations. Regarding demographics, gender, age, and tenure are closely related to leadership emergence, with research finding that women and older employees tend to exhibit lower leadership emergence, though tenure can have positive effects, likely because increased tenure typically accompanies accumulated experience and knowledge (Lisak & Erez, 2015). In terms of personality, extraversion, emotional stability, conscientiousness, and openness influence leadership emergence (Colbert et al., 2012; Ogunfowora & Bourdage, 2014). Positive self-concepts such as core self-evaluation, self-efficacy, and self-esteem also affect leadership emergence (Paunova, 2017). Regarding abilities, intelligence has long been considered an attribute of implicit leadership prototypes related to leadership performance, with scholars emphasizing intelligence as a key attribute that nearly all leaders must possess (Fiedler, 1995; Lord et al., 1986). Beyond cognitive ability, social skills and education level also predict leadership emergence, as employees with stronger emotional capabilities and more knowledge and skills are more likely to be perceived as leaders (Weinberg et al., 2019). In terms of motivational tendencies, existing research has focused on power motivation, achievement motivation, and the motivation to lead proposed by Chan and Drasgow (2001). Studies show that the motivation to acquire power indeed influences leadership emergence (Wellman et al., 2019), while achievement orientation, though potentially increasing the likelihood of becoming a formal leader (Schuh et al., 2014), does not significantly affect leadership emergence (Sorrentino & Field, 1986).

2.2 Leadership Emergence in Virtual Work Teams

Advances in information and communication technologies have made it possible to establish work teams remotely. Organizations create cross-regional teams via the internet, enabling members to collaborate in virtual interactive environments (Maznevski & Chudoba, 2000). Existing research on leadership emergence in virtual work teams has primarily examined mechanisms from trait and achievement perspectives. The trait perspective emphasizes that individuals displaying typical leader traits receive positive recognition from other team members and exhibit leadership emergence (Lord, 1985). The achievement perspective highlights that individuals who fulfill valuable roles or provide valuable contributions to help teams achieve task- or relationship-oriented goals generate leadership emergence (Lee & Farh, 2019). In traditional teams, face-to-face communication environments allow individual trait factors to play important roles. For example, extraverted individuals' emotional expressiveness and positive verbal and nonverbal behaviors are perceived as confident and powerful, enabling them to gain respect and trust from team members (Gardner & Avolio, 1998).

Agreeable individuals receive high favorability from others because they clearly demonstrate concern for others, accept others' ideas and interests, and express these through verbal and nonverbal behaviors such as body language (Judge & Bono, 2000). Emotionally stable individuals may exhibit positive and confident verbal and nonverbal behaviors, influencing other team members' leadership perceptions and demonstrating leadership emergence (Judge & Piccolo, 2004).

Virtual work teams exhibit characteristics of spatiotemporal dispersion, technological dependence, and dynamic personnel structure (Purvanova & Bono, 2009). Spatiotemporal dispersion and dynamic personnel structure reduce the frequency of face-to-face communication and shared work duration among team members. The social context and rich nonverbal cues during face-to-face communication, as well as repeated interactions formed through long-term collaboration, are crucial for trait factors to exert influence (Neubert & Taggar, 2004). Simultaneously, digital media communication has a depersonalizing tendency, making trait expression and perception more difficult (Walther, 2011). Balthazard et al. (2009) found that in face-to-face teams, individuals' extraversion and emotional stability positively influence leadership emergence, but these relationships are not significant in virtual work teams. Serban et al. (2015) demonstrated that stronger team virtuality weakens the effect of individual extraversion on leadership emergence. Research on virtual work teams indicates that spatiotemporal dispersion creates difficulties in task coordination and leaves team members lacking essential information needed to complete tasks (Bell et al., 2002). Technological dependence reduces social and contextual factors during team interactions, leading team members to engage in lower levels of socio-emotional interaction and making it difficult to develop trust relationships (Oh et al., 2006). When trait factors struggle to exert influence, team members who can help coordinate tasks effectively or promote relationship development and socio-emotional interaction among team members will more strongly influence others' leadership perceptions and demonstrate leadership emergence. Purvanova et al. (2020) found that in highly virtual teams, achievement factors play a greater role than trait factors in predicting individual leadership emergence.

Frequent and effective communication forms the foundation of effective coordination in virtual work teams, and the information transmitted through communication plays an important role in helping team members build relationships (Yoo & Alavi, 2004). Effective communication is crucial for leadership development. Misiolek and Heckman (2005) found that in virtual work teams with relatively high consensus on leader identification, leaders initiated and participated in significantly more communication than non-leaders. Similarly, Wickham and Walther (2007) discovered a significant relationship between communication frequency and leader identification in virtual work teams. Furthermore, research shows that communication quality affects leadership identification. Balthazard et al. (2009) demonstrated that in purely virtual environments, individuals who can express ideas in thoughtful, clear, and engaging text are perceived by team members as having high communication quality, which influences judgments of

their abilities and results in higher levels of leadership emergence. Charlier et al. (2016) found that in virtual work teams, individuals who type quickly and accurately demonstrate higher information richness and timeliness during text communication, enabling them to more effectively complete tasks requiring real-time collaboration, make greater contributions to the team, and influence team members' perceptions of their leadership emergence.

2.3 The Role of Communication Style in Leadership Emergence in Virtual Work Teams

Communication style refers to the manner of transmitting verbal and nonverbal information during interpersonal interactions (Gudykunst et al., 1996). Communication style is largely determined by habits, cultural background, and personality characteristics (Sanchez-Burks et al., 2003). Communication style intertwines with communication content, as style shapes content and content influences style. Communication style typically encompasses content-related features such as topic specificity and diversity, wording accuracy, and emotional richness of language expression. Information technology development has also introduced new changes to communication style. With innovations in mobile communication technology, technology-mediated communication methods have further expanded. Digital media-based communication relies on communication tools and software to fulfill communication functions—for example, using email for work communication (Hoffman et al., 1996) and forums for information exchange (Jones & Rafaeli, 2000). Research has primarily focused on communication software with specific purposes, such as email, blogs (Wellman & Gulia, 1999), and real-time chat software (Green et al., 2010). Recent studies increasingly examine the impact of digital media on communication style, though they largely continue previous paradigms by focusing on software used (e.g., Twitter, Facebook) to achieve communication purposes (e.g., crisis management, political communication).

Through comprehensive analysis of previous vocabulary used to describe communication styles, de Vries et al. (2016) proposed a three-system construct of communication style. This conceptual framework suggests that communication style, as a specific way of transmitting information during interactions, manifests in three interrelated aspects: first, the communicator's identity; second, the channels through which the communicator exerts influence; and third, the manner in which the communicator interacts with others. Because de Vries et al.'s (2016) theoretical framework is relatively comprehensive and largely reflects the main characteristics of digital media-based communication, this study employs this framework to analyze identity systems, channel systems, and interaction systems in virtual communication (see Figure 1). The identity system refers to features conveyed during communication about individual characteristics, social identity, and impressions. Features expressed in virtual communication style within this system include usernames on communication software, personalized signatures, avatar images, and specific language usage patterns.

The channel system refers to characteristics of communication channels used during social interactions. Virtual communication offers more diverse channel options, so features in this system include communication channel selection, such as text-based, audio-based, and video-based communication. Signals in this system also include software selection, such as office software versus social software. The interaction system refers to features conveyed during communication about interactive response patterns. Features of virtual communication style in the interaction system include response methods between communicators, such as “instant replies” or delayed responses. Additionally, methods of adding friends and establishing group chats are important interaction signals in virtual communication.

Figure 1. Three-System Theoretical Framework of Virtual Communication Style

A natural intrinsic connection exists between communication style and leadership, with scholars even proposing that leadership is essentially a “language game” (Fairhurst, 2008). After all, communication functions not only to transmit information but also significantly influences how participants (including oneself) understand and perceive reality. Communication styles with leadership connotations have received extensive attention from management scholars, with research finding that formal leaders can exert leadership influence on employees through communication style. Mayfield et al. (2015) found that formal leaders’ directive communication style can effectively transmit information needed to achieve goals, reduce subordinates’ role ambiguity, and provide effective performance feedback. Choudhury et al. (2019) discovered that when formal leaders vividly describe organizational vision in speeches, they can inspire subordinates, enhancing their pride and organizational identification. Mayfield et al. (2021) found that formal leaders’ empathetic communication style can provide employees with job security and develop and maintain supportive emotional relationships between employees and leaders.

Recent research has also expanded empirical analytical methods. For example, management scholars have used Linguistic Inquiry and Word Count (LIWC) to examine language similarity between CEOs and CFOs, interpreting this similarity as CFOs’ accommodation to CEOs (Shi et al., 2019). Studies have applied Latent Dirichlet Allocation (LDA) to analyze materials from CEOs’ public speeches to identify their communication styles (Choudhury et al., 2019).

Communication style reflects employees’ ability to communicate effectively and adapt to various social situations (Trenholm & Jensen, 1988). When employees can clearly and explicitly express their ideas, values, and vision, other team members may view this behavior positively and consider it consistent with typical leader behavioral qualities (Zaccaro & Bader, 2003). The influence of employees’ communication style on leadership emergence has begun to attract scholarly attention. Balthazard et al. (2009) found that when employees can clearly and accurately express their ideas and demonstrate depth of thinking, team members develop admiration, respect, and trust, positively predicting employees’

leadership emergence. Charlier et al. (2016) discovered that employees who can clearly and quickly convey task information and demonstrate more complex thinking are perceived by team members as responsible and capable, enhancing the employee's importance and influence in the team and promoting higher levels of leadership emergence.

2.4 Literature Review

Although existing literature has significantly advanced understanding of leadership emergence and communication style, substantial gaps remain between current theory and management practice needs. First, mainstream perspectives on leadership emergence largely ignore differences between online and traditional work contexts. Research on leadership emergence mechanisms in traditional contexts tends to analyze the impact of personality and attribute characteristics (including abilities, gender, etc.). Although limited, studies on leadership emergence in online work teams still follow this perspective (e.g., conscientiousness, Purvanova et al., 2020; extraversion, Wilson et al., 2021). However, online work contexts differ substantially from traditional ones. Virtual communication makes personal characteristics difficult to perceive accurately and may even lead to judgments completely contrary to reality. Even when personal characteristics are known (such as gender), the lack of intuitive presence in online work contexts means such cognition is not easily activated (unless one deliberately imagines the other person present; Kiesler et al., 1984). Due to these differences, personal characteristics are less likely to manifest in virtual communication, whereas communication style is most intuitive and prominent in online work contexts. Therefore, virtual communication style may exert a more critical influence on leadership emergence in online work teams.

Second, the nature of online work teams has substantially diverged from theoretical assumptions. Research on online work teams has primarily examined how members can coordinate and collaborate more efficiently in internet-established virtual work contexts, originating from early conceptions of "Cyberspace" that viewed the network as a virtual space relatively independent of reality. Consequently, theoretical analyses typically assume relative independence between online and traditional work contexts. However, in management practice, virtual communication has become integrated into work contexts, with boundaries between virtual and real work interaction contexts becoming blurred. For example, employees working in adjacent offices may exchange information via internet messaging to collaborate on tasks, or employees meeting with clients may use video chat to have colleagues instantly provide needed information. Given current management practice, research should focus on how virtual communication affects organizational management operations and how to better leverage its positive effects.

Finally, research on the relationship between leadership and communication has rarely examined how employees' communication styles influence leadership emergence mechanisms. Current research primarily focuses on how leaders ex-

ert leadership functions through communication style. For instance, studies find that leaders' vivid descriptions of organizational vision and values in speeches can inspire employee organizational commitment (Mayfield & Mayfield, 2018), and leaders' use of plural first-person pronouns and invitational questions can encourage subordinates to voice suggestions (Weiss et al., 2018). However, social domain research finds that specific communication styles have the potential to generate opinion leadership (e.g., "opinion leadership"; Iyengar et al., 2011). Taking opinion leaders as an example, research shows that when opinion leaders transmit professional knowledge through clear, explicit communication styles, they exert opinion guidance, triggering followers' cognitive resonance (Koh et al., 2007). When opinion leaders drive community participation through sincere, vivid communication styles, they exert emotional guidance, triggering followers' emotional resonance (Liu, Fraustino & Jin, 2016). Opinion leaders' specific communication styles can generate follower identification, influencing followers' leadership perceptions (Mehra et al., 2006). However, most opinion leaders are not formal leaders (such as internet celebrities, shopping "experts," or authoritative professionals; Casaló et al., 2021). This demonstrates that communication style can indeed influence leadership emergence, and the leadership connotations embedded in communication style warrant deeper investigation.

3. Research Framework

This study systematically examines how virtual communication style influences leadership emergence from the perspective of implicit leadership theory. This theory provides an important framework for explaining the specific pathways through which individual characteristics affect others' leadership perceptions to generate leadership emergence (Lord et al., 1984). The theory posits that leadership is a socially constructed process requiring others' recognition—that is, the alignment between the expresser's individual image and others' leader prototypes, which are abstract concepts of traits and abilities typical leaders should possess (Epitropaki & Martin, 2004). Research Content 1 first explores virtual communication styles with leadership connotations based on implicit leadership theory and preliminarily analyzes the pathways through which virtual communication style influences leadership emergence. As a specific way of transmitting information during interactions, communication style can reflect identity, channel, and interaction features (De Vries et al., 2016). Therefore, this study integrates implicit leadership theory with the three-system construct of communication style to examine what features virtual communication style presents in identity, channel, and interaction systems, and how these features subsequently influence employee leadership emergence.

Considering that unique aspects of virtual communication require targeted research methods for more detailed and accurate analysis, this study conducts three separate studies on features of identity, channel, and interaction systems based on the exploration in Research Content 1. Research Content 2 employs experimental methods combined with round-robin surveys to reveal how identity

system features of virtual communication activate interaction partners' leader prototypes to influence leadership emergence. Implicit leadership theory suggests that social perception is holistic, with multiple implicit leadership indicators combining to present a more comprehensive leadership image than single indicators (Trichas et al., 2016). Research Content 3 therefore takes virtual social channel selection combinations as the analytical object, using a pattern-oriented approach (Foti & Hauenstein, 2007) to identify virtual communication channel selection patterns and analyze how these patterns influence holistic perceptions of leadership image. Implicit leadership theory further posits that leadership perception is a dynamic process. We must recognize not only how leader prototypes influence others' cognition but also how cognition based on leader prototypes is dynamically affected by interaction processes (Foti et al., 2008). Research Content 4 adopts a combined static and dynamic perspective to examine how the structure and interaction features of virtual communication networks in online work teams influence leadership perception. This study's theoretical framework is shown in Figure 2.

3.1 Research Content 1: Exploring Leadership Connotations in Virtual Communication Styles

Figure 2. Theoretical Framework of This Study

Most virtual communication in current online work teams requires software such as WeChat and DingTalk. On these platforms, users can create usernames, select and upload avatar images, write personalized signatures, and post personal broadcasts (such as WeChat Moments). Virtual communication language usage differs from face-to-face communication (Werry, 1996); for example, virtual communication tends to use modal particles. Meanwhile, with widespread virtual communication use, new internet language usage patterns have emerged. Since online expression typically lacks restraint, emotional expression becomes more exaggerated. Online language must carry a wider emotional range, prompting communication software to develop functions for emojis, stickers, animated expressions, and image creation and forwarding—for instance, gesture symbols for handshakes or hugs and laughing emojis. These paralinguistic features (Luangrath et al., 2017) may also exhibit unique identity characteristics. Virtual communication channels are more diverse, with communicators able to choose different channels. Some channels allow more thinking space, such as text-based communication. Interaction methods also reflect key interpersonal characteristics—for example, some people add many friends but rarely communicate, while others prefer establishing group chats for communication. These largely reflect virtual communication style features. Big data analysis reveals that virtual communication style can accurately infer user gender (Ivanov & Werner, 2010), age (Rao et al., 2010), occupation (Preotiuc-Pietro et al., 2015), and even political orientation (Jagers & Walgrave, 2007). This study posits that virtual communication style may also contain leadership-related information.

3.1.1 Virtual Communication Styles with Leadership Connotations

To explore virtual communication styles with leadership connotations, this study analyzes them from a prototypes perspective. This perspective suggests that employees have prototypes in their cognition about what characteristics leaders should possess and choose to follow those who match these prototypes (Correll & Ridgeway, 2003). Based on this perspective, this study proposes that virtual communication styles with leadership connotations refer to features that align with leader prototypes in online interactions. These prototype features derive from two sources: first, team members share common, positive identity cognitions about their team, and the more a member aligns with this cognition, the more likely they are to be perceived as having leadership potential (Hogg, 2001). Second, cognition includes basic prototypes about what behaviors and expressions leaders should demonstrate (e.g., Lord & Maher, 1993). When a member exhibits corresponding behaviors or features, they are more likely to be recognized as a leader. These two aspects point to two different schema sources: typical team characteristics and leader prototype characteristics. This study considers analyzing both schema features simultaneously, attempting to characterize virtual communication styles with leadership connotations in online work teams from multiple angles. Moreover, the study attempts to characterize virtual communication style using both scales and indicators. This study synthesizes features from literature that characterize communication style and combines them with participants' reports of virtual communication style features with leadership connotations. For example, this study suggests that relatively stable emotional fluctuations may be perceived as emotional stability, which is considered a typical leader trait (Badura et al., 2021). Meanwhile, members' topic breadth during communication can, on one hand, allow other members to perceive diverse cognition and insight, as well as stronger communication ability, enhancing others' ability perception of that employee (West & Dellana, 2009). On the other hand, it can create emotional resonance among team members through similar topics and foster perceptions of a more open, inclusive communication atmosphere, enhancing others' affinity perception of that employee (Zhou et al., 2022). Members with greater ability and affinity better match leader prototypes and are more likely to be viewed as leaders (Hu et al., 2019). Overall, this study proposes that virtual communication styles aligning with leader prototypes will present key features in identity, channel, and interaction systems.

Proposition 1a: Virtual communication styles aligning with leader prototypes may present key features in identity, channel, and interaction systems.

This study plans to further characterize virtual communication styles with leadership connotations based on literature analysis and comprehensive analysis of objective indicators of virtual communication style, such as usernames (e.g., character length, whether it is a real name; Haimson & Hoffmann, 2016), avatar images (e.g., color, image type, facial expression; Liu et al., 2016), and language features (e.g., word frequency analysis such as LIWC) to capture objective char-

acteristics of images and text. This study proposes that virtual communication styles aligning with leader prototypes will reflect corresponding features in username and avatar image indicators. Username character length and whether it is a real name affect other members' impression perception. Overly long usernames create an impression of being overly complicated or complex, potentially perceived as insufficiently concise or direct, thereby affecting the member's recognizability and influence (Shafie et al., 2012). Overly short usernames may convey an impression of simplification or lack of depth, making it difficult to demonstrate the member's professionalism and authority (Suryandari & Lutfiana, 2020). Members who choose real names as usernames increase the authenticity and closeness of their virtual identity, enabling them to establish more authentic and credible images in online work contexts and making it easier for other members to form positive identity cognitions of that member (Schwarz & Williams, 2020). Avatar image color and type shape members' virtual identity. Choosing images with stable color tones helps demonstrate leaders' steadiness and authority, aligning with team members' image cognition of leaders. Selecting more professional and formal avatars, such as clear half-portrait images, establishes confident, steady images and demonstrates the member's attention to professional image (Bacev-Giles & Haji, 2017). In contrast, choosing exaggerated or comical avatars may be perceived as insufficiently formal and steady, making it difficult to gain other members' recognition and trust (Pescott, 2020). Additionally, this study proposes that image tone and contrast (Liu et al., 2016), syntactic features (e.g., rhetorical questions at sentence endings) and semantic features (e.g., first-person plural pronoun "we"), and the use of like symbols may all reflect virtual communication styles aligning with leader prototypes.

Proposition 1b: Virtual communication styles aligning with leader prototypes will be reflected in objective indicators.

3.1.2 Status Enhancement Mechanism of Leadership Emergence

Building on this foundation, this study preliminarily examines how online work team members' virtual communication styles influence their leadership emergence process. Some features have higher status value because they demonstrate that a member can bring greater value and contribution to the team (Correll & Ridgeway, 2003), known as status characteristics (Correll & Ridgeway, 2003). Status characteristics displayed by online work team members in virtual communication may grant those members higher status, thereby increasing the likelihood of leadership emergence. This study therefore proposes that virtual communication styles with status characteristics will likely enable members to achieve higher status and subsequently emerge as leaders. However, since the foundations of status are relatively diverse (Bai et al., 2020), this study proposes that virtual communication style may demonstrate different aspects of status characteristics and establish status through different pathways based on existing literature on status establishment.

This study proposes that members' virtual communication style in online work

teams may establish employee status through different pathways. Virtual communication styles aligning with leader prototypes may include directive statements and wording. According to Cheng et al.'s (2013) analysis, people tend to choose compliance rather than resistance when facing directive communication styles because resistance may trigger conflicts that could otherwise be avoided. For example, research finds that aggressive language is more likely to elicit compliance from others (Cheng et al., 2013). The primary reason is that virtual communication styles aligning with leader prototypes may make others perceive the communicator as highly capable. For instance, displaying personal achievements in social media posts, resolutely expressing judgments and attitudes about matters, and using more content words in expression. These features lead others to judge that the member has high ability (Hughes et al., 2011).

Proposition 2a: Virtual communication styles aligning with leader prototypes positively influence other members' ability perception of that employee.

Simultaneously, virtual communication styles aligning with leader prototypes may influence others through emotional contagion. For example, using proximity-expressing gesture symbols and employing first-person plural "we." Moreover, communication styles with leadership connotations can enable others to perceive the communicator's emotional state through rich emotional expression (Derks et al., 2008), although the expressed emotions may not reflect the true emotional state. Such communication styles help close distance, build relationships, and enable better acceptance by other members.

Proposition 2b: Virtual communication styles aligning with leader prototypes positively influence other members' affinity perception of that employee.

This study further proposes that virtual communication styles aligning with leader prototypes enhance other members' ability and affinity perceptions of an employee through different pathways, thereby elevating their social status and ultimately promoting leadership emergence. Virtual communication styles aligning with leader prototypes shape employees' authoritative image and ability evaluation on one hand, and promote interpersonal acceptance through emotional contagion on the other. Employees with greater ability receive more respect and admiration from other members, while employees with greater affinity receive more trust and dependence. Employees with both ability and affinity are perceived as bringing greater value and contribution to the team and are granted higher social status (Hu et al., 2019). High-status employees can positively influence other members' self-awareness, as other members are more willing to view them as leaders. High-status employees can also exert greater influence and are perceived as capable of leading the team to obtain key benefits, causing other members to perceive more leadership influence from them and become their followers (McClellan et al., 2018).

Proposition 2c: Virtual communication styles aligning with leader prototypes promote leadership emergence by positively influencing ability and affinity perceptions to enhance social status.

Establishing trust in online interactions is more difficult than in face-to-face interactions. The presence or absence of sufficient trust as a foundation creates significant differences in online interaction expectations and outcomes (Malhotra & Majchrzak, 2014). Because establishing trust online requires greater effort and more time, most online work teams in practice first interact offline to build trust (Dineen et al., 2007). Trust refers to the level of trust formed through offline interaction that serves as the foundation for online interaction. Different trust levels affect how other members interpret employees' virtual communication styles. Under high trust levels, other members make positive expectations and interpretations of employees' virtual communication styles aligning with leader prototypes. Employees' pressuring communication style is interpreted as an effective task organization and coordination approach, with employees exhibiting such styles out of concern for the team's overall interests (McClanahan, 2020). Employees' communication styles that demonstrate their abilities are more easily accepted and respected by other members, who believe these employees can lead the team to success (Lee & Farh, 2019). Employees' communication styles with rich emotional expression are interpreted as sincere attempts to build intimate relationships with other members and provide emotional support to the team (Algoe et al., 2020). Other members' positive evaluation and recognition of employees' virtual communication styles help elevate those members' social status and promote their leadership emergence.

Conversely, under low trust levels, other members make negative interpretations of employees' virtual communication styles aligning with leader prototypes. They are more likely to interpret employees' pressuring communication style as threatening and power-abusing, with employees exhibiting such styles to dominate others for self-interest rather than out of concern for team interests (Kakkar et al., 2020). Employees' communication styles that demonstrate their abilities are perceived as self-aggrandizing, triggering other members' suspicion and dissatisfaction and causing resistance (Fan et al., 2019). Employees' communication styles with rich emotional expression are seen as hypocritical, with employees not sincerely attempting to build relationships, leading other members to hold distrustful and suspicious attitudes (Leong et al., 2020). Overall, this study proposes that trust level moderates the influence of virtual communication styles aligning with leader prototypes on leadership emergence.

Proposition 2d: The effect of virtual communication styles aligning with leader prototypes on leadership emergence through members' social status is moderated by trust: under higher trust levels, the positive effect of virtual communication style on leadership emergence through enhanced social status is strengthened.

Virtual communication styles aligning with leader prototypes possess status characteristics but may not always achieve status enhancement effects. Recent scholarship has attempted to clarify why the same characteristics and behaviors can enhance personal status in some contexts but not others. Based on offline interaction experiences, members form understandings of each other's

face-to-face communication styles. This study proposes that face-to-face communication style is a key contextual factor. The match between face-to-face and virtual communication styles likely affects members' social status. If large differences exist between virtual and face-to-face communication styles, other members may feel that online interactions do not meet expectations, potentially reducing their willingness to accept the member. Such acceptance can promote influence from that member and elevate their status in the team (Tang et al., 2023). Status enhancement may further influence leadership emergence.

Proposition 2e: The match between face-to-face and virtual communication styles positively influences other members' acceptance, enhances the member's relative status, and subsequently affects leadership emergence.

3.1.3 Relationship Building Mechanism of Leadership Emergence

Communication software has increasingly provided newly developed functions in recent years, such as quoting and forwarding others' messages, marking messages as read, etc. Online work teams widely use these functions, making virtual communication exhibit many interpersonal characteristics different from traditional communication. Some people tend to forward information (whether in social media or group chats), while others prefer to paraphrase or express opinions. Some choose to remind specific communication targets and post messages in group chats, while others may prefer to send messages privately one by one. Communication styles that quote or forward others' messages can increase information interconnectedness and improve communication clarity. During online interactions, team members' virtual communication exhibits similar interpersonal characteristics, and this similarity may help build workplace friendships. Team members with similar virtual communication styles are more likely to reach consensus on information interpretation, and this shared understanding helps establish mutual understanding and resonance, promoting workplace friendship formation (Sias & Cahill, 1998). Similar communication styles may also reduce communication barriers, as team members more easily understand each other's intentions and contexts, reducing communication misunderstandings and thereby enhancing workplace friendship development (Sias et al., 2012). Additionally, similar communication styles can establish a sense of trust and closeness. Team members are more likely to feel affection and trust toward colleagues with similar communication styles, providing a solid foundation for friendship establishment (Omuris, 2019).

When employees build workplace friendships with colleagues, colleagues make positive evaluations of them, and individuals who receive positive evaluations in task and social contexts are likely to become informal leaders. By developing workplace friendships, employees can establish a solid trust foundation in interpersonal relationships, gaining greater influence and higher status through trust relationships (Dirks, 1999). Colleagues are also more inclined to support employees in friendship relationships, making employees more persuasive and influential in the team (Bakiev, 2013). Furthermore, colleagues may psycho-

logically feel close to employees in friendship relationships and develop high social identification, viewing those employees as informal leaders (Pillemer & Rothbard, 2018). Therefore, friendship relationship establishment promotes employee leadership emergence.

Proposition 3a: Similarity in virtual communication styles between employees and colleagues helps build good workplace friendships, positively influencing the employee's leadership emergence.

This study proposes another possibility between virtual communication style similarity and relationship building. As previously mentioned, communication style conveys communicators' identity information, which may contain cues about relative status between parties. For example, when one person issues a request or command to another, the communication contains cues about the relationship between speaker and listener. These interpersonal connotations and cues largely shape relative status between parties (Chen et al., 2003). If information about relative status conveyed by both parties conflicts, it may create uncertainty in their relationship. Zhang et al. (2020) propose that it is important for employees to clearly understand their relative status with colleagues during interactions and introduce the concept of relational uncertainty. Relational uncertainty refers to employees lacking clear norms and expectations for how to interact with colleagues (Zhang et al., 2020), and they argue this uncertainty stems from the absence of clear, stable relative status. This study proposes that virtual communication style similarity implying hierarchical relationships between communicators may increase relational uncertainty in their interactions. For example, commanding tones contain cues about the speaker's higher status relative to the listener. If team members all use commanding tones with each other, it increases relational uncertainty between them. Because this uncertainty contains variables and contradictions in relative status, it reduces the likelihood of leadership emergence.

Proposition 3b: Virtual communication style similarity between employees and colleagues that implies hierarchical relationships may increase relational uncertainty between communicators, negatively influencing the employee's leadership emergence.

This study also proposes that the effect of virtual communication style similarity on workplace friendships may be moderated by trust levels accumulated through offline interaction between communicators. Without sufficient trust established through offline interaction, both parties will have ambiguous attributions about each other's online behavior (Tang Yipeng et al., 2022). Low trust levels weaken the effect of virtual communication style similarity on building good relationships. Low trust may trigger suspicion about each other's motives, with colleagues suspecting whether employees' communication styles are authentic and believing employees are deliberately mimicking their communication styles. This suspicion prevents both parties from building mutual understanding and resonance through similar communication styles, hindering workplace friendship establishment (Pillemer & Rothbard, 2018). Low trust

may also lead to negative interpretations of employees' communication intentions, resulting in more communication misunderstandings, increasing conflict likelihood, and causing colleagues to be more rejecting and vigilant toward employees, weakening the trust and closeness brought by similar communication styles and causing both parties to lose opportunities to develop workplace friendships (Fasbender et al., 2023).

Proposition 3e: The effect of virtual communication style similarity between employees and colleagues on leadership emergence through workplace friendships is moderated by trust between communicators: under lower trust levels, the positive effect of virtual communication style similarity on leadership emergence through workplace friendships is weakened.

Furthermore, lower trust levels may strengthen the effect of virtual communication style on relational uncertainty. Low trust causes both parties to be more suspicious of each other's thoughts and intentions, with colleagues becoming more sensitive to cues transmitted during employees' communication processes (Schilke & Huang, 2018), more easily perceiving relative status cues contained in similar communication styles, and consequently experiencing greater relational uncertainty. Low trust also causes both parties to more easily make negative interpretations of each other's transmitted information, with colleagues believing employees use commanding tones to gain status and power to control and dominate them (Kakkar et al., 2020) rather than to promote cooperation and goal achievement. Both parties will attribute identity information transmitted in similar communication styles more to each other's relative status cues, thereby perceiving greater relational uncertainty.

Proposition 3f: The effect of virtual communication style similarity between employees and colleagues that implies hierarchical relationships on leadership emergence through increased relational uncertainty is moderated by trust between communicators: under lower trust levels, the negative effect of virtual communication style similarity on leadership emergence through relational uncertainty is strengthened.

3.2 Research Content 2: Impact of Identity System Characteristics on Leadership Emergence

This study analyzes which key features of the identity system in virtual communication help team members establish their leader identity during interactions. The identity system refers to features conveyed during virtual communication about communicators' personal attributes, social identity, and impressions, including usernames on communication software, personalized signatures, avatar images, etc. These features have important impression management functions (Thimm, 2008), meaning they attract others' attention and direct it toward the communicator. Identity system features in virtual communication indeed affect others' impressions and feelings, which may shape the leadership emergence process. Recent research combining questionnaire surveys and big data

analysis found that users' personalities affect their avatar image selection on communication software (Liu et al., 2016). Users high in extraversion adopt avatars expressing positive emotions or photos with friends; users high in conscientiousness typically have avatar images with rich colors and brighter tones; users high in openness typically choose more aesthetic images and are more willing than others to use images expressing anger rather than pleasant emotions as avatars. Although some understanding exists in this area, existing research rarely examines how users' identity affects their online image, which is essentially users' self-presentation on social media. Users' choices of avatar images and usernames are largely influenced by their identity identification (Pentland, 1999).

Leadership emergence involves the construction of leader identity during team interactions (DeRue & Ashford, 2010; Marchiondo et al., 2015). Research finds that team members as prospective leaders intentionally or unintentionally express leader identity during interactions with other members, and this identity may be recognized by other members (Marchiondo et al., 2015) and establish that member's leader role (i.e., leadership emergence). This process requires two conditions (Badura et al., 2021). First, prospective leaders must recognize their leadership potential and be willing to make leader identity claims, typically requiring the member to explore and reflect on their experiences (Zheng, Meister et al., 2021). Second, leader identity construction requires prospective followers to recognize that member's identity. DeRue and Ashford (2010) label these two aspects as leader identity claiming and leader identity granting. It should be clarified that no specific sequence exists between prospective leaders claiming leader identity and prospective followers granting that identity. Prospective leaders may claim leader identity first, with prospective followers gradually accepting their leadership, or prospective followers may first recognize prospective leaders' leader identity, with those members gradually accepting and claiming it. This study proposes that members with identity system features possessing leadership connotations can more easily gain others' recognition of their leader identity claims.

During online interactions, members' identity system features shape their online image, influencing other members' impressions and feelings. Employees' professional, authentic avatars and usernames convey a formal, reliable image that helps them construct an authoritative, credible impression in other members' cognition. This impression aligns with other members' leader identity cognition (Pescott, 2020), so other members may grant more recognition to that member's leader identity. Conversely, employees' exaggerated or comical avatars and usernames convey an insufficiently formal, steady image that does not align with other members' leader prototype cognition (Schwarz & Williams, 2020), making it difficult for other members to identify with those employees' leader identity. Therefore, this study proposes that members whose identity system features align with leader prototypes more easily receive other members' recognition of their leader identity.

Proposition 4a: Identity system features aligning with leader prototypes positively influence other members' leader identity granting toward that member.

Additionally, this study explores whether members whose identity system features align with leader prototypes (e.g., Member A) recognizing other members' (e.g., Member B) leadership identity claims affect the claimant's (e.g., Member B) leadership emergence. This study proposes this effect may be greater than from members whose identity system features do not align with leader prototypes. For example, Member A (with identity system features aligning with leader prototypes) recognizes Member B's (also with identity system features aligning with leader prototypes) leader identity claim. In this case, the team has the highest evaluation of Member B, and Member B's status and leadership emergence likelihood are highest. Conversely, Member A (with identity system features aligning with leader prototypes) does not recognize Member B's (without identity system features aligning with leader prototypes) leader identity claim. In this case, the team has the lowest evaluation of Member B, and Member B's status and leadership emergence likelihood are lowest. This part employs experimental methods, designing common digital media communication scenarios in online work teams and manipulating members' identity system features and leader identity claiming and granting behaviors.

Proposition 4b: The effect of identity system features on other members' leader identity granting is moderated by other members' identity system features: when identity system features align with leader prototypes and are granted by other members, identity system features have a stronger effect on the claimant's leadership emergence.

3.3 Research Content 3: Impact of Channel System Characteristics on Leadership Emergence

Most virtual communication is text-based (Cakula & Pratt, 2021)—a communication method that organizes language into text for exchange—largely due to limitations in information communication technology that often prevent smooth video and audio communication. However, with rapid technological progress and iterative updates in recent years, digital communication has gradually been able to support smooth video and voice calls, making audio-based and video-based communication increasingly popular. Most online meetings in the past two years have adopted video or audio formats, and virtual communication channels are being greatly expanded. When choosing among existing communication channels, people can adopt text-based communication, such as sending text or image messages; they can also use audio-based communication functions in software, such as sending voice messages; or they can use instant audio- or video-based communication functions in social software, such as voice and video chats. In online work teams, virtual communication channel selection also includes communication software selection, as team members typically have both typical work communication software (e.g., DingTalk, Enterprise WeChat, or email) and typical social communication software (e.g., WeChat or Tencent QQ). With

more diverse virtual communication channels available, team members' channel selection can reflect their communication style characteristics, which may shape their leadership emergence in work teams.

Team members' virtual communication channel selection is influenced by communication context on one hand, with members choosing different channels based on communication content and partners. On the other hand, it is also largely influenced by members' thinking styles, personality characteristics, and life experiences, often carrying personal characteristics. Some people prefer instant communication channels, while others favor text communication; some differentiate between communication software usage, while others do not. Since existing research on virtual communication channel selection is relatively limited, this study adopts a pattern-oriented exploratory research method (pattern approach; Foti & Hauenstein, 2007) to analyze what patterns emerge in online work team members' communication channel selection and whether these patterns affect members' leadership emergence in teams.

3.3.1 Identifying Virtual Communication Channel Selection Patterns

Team members typically do not use single channels but multiple channels simultaneously when making channel selections. Employees may choose corresponding communication channels based on different communication content in virtual communication. For example, if communication content is highly private and unsuitable for leaving records, they may choose video or audio communication; if communication content may be controversial and requires consensus, they may choose text communication because text can be reviewed and compared. This study attempts comprehensive analysis of multiple channels. Current commonly used variable-centered approaches (Zyphur, 2009) have significant limitations in handling this issue. For example, the usual practice for handling multi-variable combinations in such methods is analyzing interaction effects. Since virtual communication channel selection may have many dimensions, using this research method would require analyzing too many interaction terms. Assuming five selection tendencies exist, this would produce ten two-way interaction terms, ten three-way interaction terms, five four-way interaction terms, and one five-way interaction term, making the research process extremely complex and results difficult to interpret. Therefore, this study intends to adopt a person-centered research method.

Although person-centered research methods still examine variable combinations, their analytical approach differs from variable-centered methods (Zyphur, 2009). Person-centered analysis primarily uses multiple dimensions of virtual communication channel selection as indicators for latent profile analysis (LPA). Specifically, this method identifies different virtual communication channel selection patterns (referring to personal characteristics in channel combination selection during virtual communication) and categorizes members accordingly. Management scholars have recently begun using person-centered methods to analyze organizational behavior. For example, researchers have used LPA to analyze

patterns of organizational commitment (e.g., combinations of affective, continuance, and normative commitment; Meyer et al., 2012) and recovery experience patterns (e.g., combinations of relaxation experience, psychological detachment, mastery experience, and control experience; Bennett et al., 2016). This method's advantage lies not only in distinguishing qualitatively and quantitatively different patterns but more importantly in analyzing relationships between different patterns and antecedent and outcome variables. In this study, it can be used to identify team members' communication channel selection patterns and compare whether different members have similar channel selection patterns during virtual communication.

Proposition 5a: Virtual communication channel selection patterns exhibit qualitative and quantitative differences.

3.3.2 Analyzing the Impact of Communication Channel Selection Patterns on Team Members' Leadership Emergence

Although virtual communication channel selection has relatively stable personal characteristics, selection patterns may also differ based on communication partners. After all, communication occurs through interactions between people. Research finds that when communicating with different people, individuals naturally change tone and intonation (Bernieri et al., 1994), wording patterns (Pennebaker & Niederhoffer, 2003), and responsiveness (Richmond & McCroskey, 2000). Despite individual differences in virtual communication channel selection patterns, people may still exhibit consistent behavioral patterns when communicating with different partners. This study's main purpose is to examine the stability of members' virtual communication channel selection patterns and the variability exhibited when communicating with different partners. Individual differences in communication partners may predict these variations. This study proposes that variability in channel selection patterns when communicating with different partners may mainly manifest as quantitative differences, while stability is more likely to manifest as qualitative similarity. That is, when employees communicate with different partners, their virtual communication channel selection is basically similar in combination patterns (qualitative similarity), but the values of each dimension of virtual communication channel selection differ (quantitative differences).

Proposition 5b: Virtual communication channel selection patterns exhibited by members when communicating with different partners show quantitative differences and qualitative similarity.

Online work team members' communication channel selection patterns may shape other members' feelings toward them and influence their leadership emergence process because these patterns and their changes demonstrate members' communication thinking and their ability to handle different situations. This study analyzes this issue from the perspective of framing theory (Loke, 1989). This theory suggests that using different mental frames to view the same thing

may trigger completely different subsequent feedback. For example, understanding a task as masculine (e.g., bargaining for a car vs. bargaining for groceries) leads men to exhibit more leadership behaviors in the task. This study proposes that digital media communication channel selection patterns likely shape how members view this communication method and determine what leadership behaviors they exhibit in digital media communication (e.g., providing advice, task-oriented behaviors, boundary-spanning behaviors, social behaviors), which affect members' leadership emergence. Specifically, employees may view text communication as a formal and detailed communication method, relatively formal in nature, suitable for formal work and business contexts. Text communication provides sufficient time for communicators to carefully think and express viewpoints, thereby providing more detailed suggestions (Dennis et al., 2008). The written form of text makes information easier to understand and preserve, helping accurately convey complex concepts and information. Text records can be preserved as formal documents for future reference and traceability (Mao Jianghua & Chen Rongxin, 2023). Employees believe text communication can accomplish more task-oriented leadership behaviors, such as providing suggestions to other members or making boundary-spanning behaviors. Employees may view audio or video communication as a humanized, emotion-rich communication method. Audio and video can transmit communicators' tone, speech rate, and emotion, making information more humanized (Ishii & Markman, 2016). This direct communication method helps establish more authentic and intimate communication experiences in online contexts, promoting social connections among team members. Employees believe audio and video communication can accomplish more relationship-oriented leadership behaviors, such as people-oriented behaviors or social behaviors.

Furthermore, this study considers another aspect: how members' digital media communication channel selection patterns affect other members' impressions and judgments of them. Employees adopting text communication lead other members to perceive their depth of thinking and believe they have more precise expression ability and stronger professional competence (Charlier et al., 2016). Other members will trust them more and believe they can achieve more instrumental social value (contributing to team goal achievement). Employees adopting audio or video communication lead other members to perceive more of their emotional states, enabling greater emotional resonance with them (Ishii & Markman, 2016), perceiving their affinity and believing they can achieve more relational social value (making others feel meaningful relationships). Leary et al. (2014) propose that employees exhibiting higher-value behaviors in social interactions are granted higher status. This study proposes that virtual communication channel selection patterns may affect other employees' evaluation of that member's social value, thereby influencing that member's leadership emergence.

Proposition 5c: Virtual communication channel selection patterns affect members' task-oriented and social leadership behaviors, thereby positively influencing their leadership emergence.

3.4 Research Content 4: Impact of Interaction System Characteristics on Leadership Emergence

Most communication software has friend-adding and group-creation functions. When online work teams use communication software, members can establish interpersonal connections with all or some team members through friend-adding, or create chat groups to communicate with all or some team members in different scopes. This study proposes that friend-adding and group-creation methods likely affect members' leadership emergence in online work teams. Leadership is "a complex social dynamic" (Avolio et al., 2009). To understand this complex dynamic, an increasing number of leadership studies attempt analysis based on social network theory (Carter & DeChurch, 2015). This perspective mainly analyzes the structure and patterns of interpersonal relationships formed among a group of people, thereby examining the formation and evolution of interpersonal relationships (Borgatti et al., 2009). Social network models have static and dynamic analytical perspectives. The static perspective mainly analyzes structural features of social networks and individuals' positions in networks, such as centrality and structural holes. The dynamic perspective attempts to examine changes in social networks, such as newcomers entering, new interpersonal connections forming, and old members leaving.

Since friend-adding typically occurs when people first meet and changes little afterward, this study adopts a static perspective to examine how friend-adding methods affect members' leadership emergence. This study proposes that friend-adding methods shape members' centrality in online networks. Network centrality measures individuals' criticality in network structure, while friend-adding operations represent initial social connections. Through friend-adding, members can establish initial relationships in team social networks, expanding connections with other members. This may grant members higher network centrality, placing them in important positions in the overall network structure (Balkundi & Kilduff, 2006). Members with high online network centrality often occupy important positions in team communication, serving as information supporters and information exchange nodes who provide information support (such as professional knowledge and skills) to team members and promote information flow, ultimately helping teams achieve higher efficiency and performance (Pan et al., 2018). Members with high online network centrality also engage in more social interactions with team members, better understanding their needs, providing social support and individual care, enabling team members to build closer relationships, enhancing trust and reducing loneliness, thereby motivating them to contribute to the team (Burke et al., 2006). Achievement-oriented leadership emergence research indicates that leadership emergence occurs when employees help teams achieve task- or relationship-oriented goals (Lee & Farh, 2019). Therefore, this study proposes that online network centrality may influence leadership emergence.

This study also proposes that communication activity level (e.g., low-activity communication averaging less than once per month) likely moderates the effect

of network structure on members' leadership emergence. When team members establish interpersonal connections through friend-adding in online work teams, communication activity level may affect the strength and continuity of these connections. Higher communication activity means members participate more frequently and actively in online interactions, thereby deepening their communication foundation. From the static social network theory perspective, communication activity may influence leadership emergence by strengthening network centrality (Shih, 2014). High communication activity enables individuals to participate more frequently in exchanges in friendship and advice networks, occupying more prominent positions in networks (Muscanell & Guadagno, 2012). This centrality may play a positive role in leadership emergence.

Proposition 6a: Online network centrality positively influences leadership emergence.

Proposition 6b: The effect of online network centrality on leadership emergence is moderated by communication activity: under higher communication activity, the positive effect of online network centrality on leadership emergence is strengthened.

Since creating groups on communication software is convenient, the types of chat groups colleagues establish are very diverse: some are work-oriented, some are social, and some serve specific purposes (e.g., ordering food, sending materials). To comprehensively understand this process, this study adopts a combined static and dynamic perspective to analyze how group-creation methods affect leadership emergence. The number of groups initiated, group member count, and breadth of group chat content coverage may all affect group initiators' leadership emergence. Additionally, this study proposes that being included in groups also importantly affects members' leadership emergence, suggesting that the number of groups a member is included in (and excluded from) and the orientation of included groups (e.g., work-oriented vs. social-oriented) may affect members' leadership emergence. This study also adopts a dynamic perspective to analyze the leadership emergence process (Landis et al., 2022). From the social network perspective, the leadership emergence process is viewed as gradual establishment of leadership ties. Some leadership ties may not have existed previously but gradually form; some may have existed originally but gradually disappear; and some may persist continuously.

This study proposes that the number of groups initiated, group member count, and breadth of group chat content coverage may affect group initiators' leadership emergence. First, the number of groups initiated reflects initiators' social and organizational abilities. Frequently initiating various groups demonstrates not only active social willingness but also the ability to organize team members. Other team members realize that initiators play connecting roles in the team and perceive greater leadership influence from them (Drescher & Garbers, 2016). Second, when a group has many members, other team members perceive that the initiator has stronger communication and coordination abilities to promote interaction and information flow among more members, enhancing their ability

perception of the initiator. Finally, breadth of group chat content coverage is also an important factor affecting initiators' leadership emergence. Extensive and in-depth group chat content means team members conduct large amounts of work- and social-oriented communication within the group, which is crucial for effectively coordinating team tasks and professional knowledge and enhancing team emotional interaction levels. Other team members perceive that initiators make greater contributions to the team and evaluate their leadership more highly (Lee & Farh, 2019).

Proposition 6c: Characteristics of initiated chat groups (including initiation quantity, member count, and group chat breadth) affect initiators' leadership emergence.

This study also proposes that being included in groups importantly affects members' leadership emergence, suggesting that the number of groups a member is included in (and excluded from) and the orientation of included groups (e.g., work-oriented vs. social-oriented) may affect participants' leadership emergence. The number of groups a member is included in reflects their activity level and participation degree in the team. Employees who frequently participate in various groups are more easily perceived by other team members, who believe participants can obtain more task information and are more accepted by the team, perceiving participants' potential to coordinate work and promote team member interaction and identifying with them more (Kwok et al., 2018). Conversely, if a member is frequently excluded from key groups, other team members believe that employee cannot obtain important task information and is rejected within the team, and that the participant cannot help the team complete important work tasks or promote effective emotional interaction within the team (Carter et al., 2015). Additionally, the orientation of included groups affects participants' leadership emergence. Participants included in work-oriented groups are perceived as more professional and goal-oriented, with other team members tending to view them as work role models and believing they can lead them to achieve task-oriented goals (Walter et al., 2012). Participants included in social-oriented groups are perceived as more affable and interpersonally skilled, more easily gaining support and trust in the team, with other team members believing they can promote friendly relationships among team members and enhance team trust atmosphere and cohesion (Lanaj & Hollenbeck, 2015).

Proposition 6d: Characteristics of participated chat groups (including number of groups included in, number of groups excluded from, and group orientation) affect participants' leadership emergence.

Furthermore, this study proposes that group chat initiation, activity, and dormancy likely influence changes in leadership ties. For initiators, group chat initiation represents initial formation of leadership ties. Initiators create groups, attract new members to join, and form preliminary leadership ties. During group chat activity stages, initiators actively participate in group interactions, guide discussions, exert leadership influence, and gradually establish leadership ties with members. When groups become dormant, old members leaving and re-

duced group interaction cause initiators' established leadership ties to gradually disappear (Balkundi & Kilduff, 2006). For participants, group chat initiation provides opportunities to establish interpersonal relationships and initially form leadership ties with other group members. During group chat activity stages, participants actively engage in discussions guided by initiators, provide valuable task information or promote group emotional interaction, and gradually establish leadership ties with other group members. When groups become dormant, old members leaving and reduced group interaction cause participants to have difficulty conducting valuable interactions with other members, and participants' previously established leadership ties gradually disappear while new ties become difficult to establish (Pietsch & Tulowitzki, 2017).

Proposition 6e: Dynamic characteristics of chat groups (including initiation, activity, and dormancy) affect the dynamic process of leadership emergence for initiators and participants.

4. Theoretical Construction

This study constructs the concept of virtual communication style aligning with leader prototypes based on implicit leadership theory and characterizes key features of virtual communication style in identity, channel, and interaction systems according to the three-system construct of communication style. Through four closely related, progressively content-deepening studies, this study attempts to build a relatively systematic and complete theoretical framework. Research Content 1 explores virtual communication styles with leadership connotations and preliminarily examines status enhancement and relationship building mechanisms of leadership emergence in online work teams. Based on this, three studies build theoretical analyses of how identity, channel, and interaction system characteristics affect leadership emergence from different perspectives. This study mainly makes theoretical contributions in three aspects.

First, this study explores how the content and expression of leader prototypes change in online work contexts. Implicit leadership theory suggests that employees form leader prototypes in their cognition and choose to follow those who align with these prototypes (Correll & Ridgeway, 2003). However, the 普及 of online work contexts in workplaces has changed leadership content and form to some extent, which is the key issue this study addresses. Previous studies using implicit leadership theory have mostly examined how traditional contextual characteristic factors (e.g., extraversion and agreeableness) affect leadership emergence, but few have examined how online contextual characteristic factors shape others' leadership perceptions. This study proposes that virtual communication styles with leadership connotations refer to features aligning with leader prototypes in online interactions. Based on the communication style theoretical framework, this study proposes that these features manifest in identity, channel, and interaction systems. For example, using more professional and formal personal profile avatars conveys reliability; avoiding extreme emotional expression builds a steady image. This study also proposes that virtual com-

munication effects are largely influenced by offline interactions, suggesting that work team foundational trust levels and the match between team members' virtual and face-to-face communication styles affect other members' expectations of that member, thereby influencing that member's status and leadership emergence. By examining leadership emergence mechanisms in online work contexts, this study expands the application scenarios and logical connotations of implicit leadership theory.

Second, this study analyzes how employees construct their leader identity through virtual communication with other team members. Leader identity construction is an interpersonal process (DeRue & Ashford, 2010). Typically, this process includes two aspects: prospective leaders' leader identity claims and prospective followers' leader identity granting. This study proposes that identity claiming may not necessarily manifest as specific interpersonal interaction behaviors. Communication software development has made virtual communication exhibit many interpersonal characteristics different from traditional communication, and these characteristics may produce leader identity claiming effects—for example, conveying employees' leader identity through authoritative identity system features, proposing that virtual communication styles aligning with leader prototypes may lead other team members to grant greater recognition of employees' leader identity. Additionally, this study further proposes that virtual communication style alignment with leader prototypes by members may also produce greater impact when granting (or denying) other members' leader identity claims. Meanwhile, information conveyed by virtual communication style about communicators also contains cues about relative status between communicators. When both parties adopt virtual communication styles implying hierarchical relationships, the relative status information they convey conflicts, thereby increasing relational uncertainty between them and reducing the likelihood of leadership emergence (Zhang et al., 2020). Research shows that interpersonal characteristics of communicators affect their interpersonal relationships during interactions, and displaying similar interpersonal characteristics helps build trust and close relationships (Pillemer & Rothbard, 2018). This study enriches the theoretical process of constructing leader identity in interpersonal interactions by introducing virtual communication style.

Third, this study examines the impact mechanisms of virtual communication style on leadership emergence using a multi-perspective, multi-method approach. Leader identity perception is a relatively holistic social perception. In online work contexts, employees can use various channels and methods for virtual communication, such as adding friends, creating group chats, voice messages, and video conferences. All these aspects may affect employees' leader identity perception and thereby influence leadership emergence. Moreover, scholars increasingly emphasize the relational nature of leadership and conceptualize it as a dynamic social process (Carter et al., 2015). In this process, interactions among team members affect who becomes a leader. This study proposes that ways of establishing connections in virtual communication likely

affect members' leadership emergence in online work teams. This study uses social network theory for analysis, which has static and dynamic perspectives. The static perspective mainly analyzes structural features of social networks and individuals' positions in networks, while the dynamic perspective examines changes in social networks (Zohar & Tenne-Gazit, 2008). In static terms, virtual communication style may affect team members' social network structural features, thereby affecting leadership emergence. In dynamic terms, the social network perspective views leadership emergence as a process of leadership tie establishment and dissolution, while virtual communication style (including initiation, activity, and dormancy) likely affects changes in leadership ties, thereby affecting the dynamic process of leadership emergence for initiators and participants. This study combines static and dynamic perspectives with person-centered and variable-centered methods to comprehensively explain the influence of virtual communication style on leadership emergence in online work teams.

This study also makes three theoretical innovations and expansions. First, it characterizes key features of virtual communication styles with leadership connotations from multiple angles. Communication research in management, anthropology, and political science has developed many new methods and themes over the past decades. Scholars have begun focusing on the role of digital media in organizational management. This study analyzes virtual communication styles with leadership connotations and deeply examines the mechanisms of leadership emergence in online work teams from a communication style perspective. Since related research is still in its early stages, it remains unclear what features different styles present in this communication form. Therefore, by identifying features of virtual communication styles with leadership connotations and providing scientific, effective measurement tools through multi-angle characterization, this study lays a solid foundation for subsequent research. Second, this study clearly elucidates the mechanism through which virtual communication style affects leadership emergence in online work teams. Since a natural intrinsic connection exists between communication and leadership, and online work team functioning depends on members' leadership emergence, how to leverage digital media to exert social influence and emerge as leaders is key to ensuring effective online work team operation. This study deeply and systematically analyzes features of virtual communication style and examines its influence mechanisms on leadership emergence, conducting targeted research on different aspects of virtual communication style to explore how these features affect leadership emergence. By employing multi-perspective analysis, this study clearly reveals the mechanisms through which virtual communication style influences leadership emergence in online work teams, expanding existing research ideas and perspectives on leadership emergence and opening a highly promising new research area. Finally, this study deeply reveals the process through which digital media shapes communication style features and leadership emergence. With the wave of information communication technology transformation, informatized and intelligent management has gradually become an important trend

in enterprise development. Digital media-based communication has become increasingly common among enterprise employees (not just the often-discussed “millennial” generation). How to conduct organizational communication and management through digital media is an important topic facing management in the new era. Virtual communication not only broadens the diversity and possibilities of communication expression but also shapes

Note: Figure translations are in progress. See original paper for figures.

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