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## How Does Virtual Communication Influence Superior-Subordinate Power Configuration? An Identity Self-Construction and Mutual Construction Perspective

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### Abstract

The widespread application of information and communication technologies has made virtual communication the predominant mode of communication in organizations. Compared with traditional face-to-face communication, virtual communication is characterized by cue filtering, geographical dispersion, and asynchronicity, which substantially reduces power cues and social norm constraints in superior-subordinate communication, triggers disruptions in power exercise and feedback processes, and impacts the existing power relationship dynamics between superiors and subordinates. However, previous research has devoted limited attention to whether and how virtual communication influences traditional position power-based superior-subordinate power configuration. Drawing on perspectives of identity self-construction and mutual construction, this study focuses on superior-subordinate virtual communication and investigates how static technical cues at the individual level, dynamic information behaviors at the event level, and virtual communication patterns at the interpersonal level affect superior-subordinate psychological and structural power configuration. This study integrates perspectives and theories from organizational behavior, information systems, and communication disciplines, constructs a theoretical framework for the influence of virtual communication on superior-subordinate power configuration, expands the research content and boundaries of organizational communication and power, and will provide reference for organizational virtual communication practices and virtual team management.

## Full Text

### Preamble

#### **How Does Virtual Communication Affect Supervisor-Subordinate Power Configuration? A Perspective from Identity Self-Construction and Mutual Construction**

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**Abstract:** The widespread application of information and communication technologies (ICT) has made virtual communication the predominant mode of interaction in organizations. Compared to traditional face-to-face communication, virtual communication is characterized by cue-filtering, geographic dispersion, and asynchronicity, which significantly reduce power cues and social norm constraints during supervisor-subordinate interactions, interrupting processes of power expression and feedback and challenging existing power relationship structures. However, previous research has paid limited attention to whether and how virtual communication affects traditional position-based hierarchical power configurations. Drawing on perspectives of identity self-construction and mutual construction, this study examines how static technical cues at the individual level, dynamic information behaviors at the episodic level, and virtual communication patterns at the interpersonal level influence psychological and structural power configurations between supervisors and subordinates. By integrating theories and perspectives from organizational behavior, information systems, and communication disciplines, this study constructs a theoretical framework of how virtual communication affects supervisor-subordinate power configuration, extending the scope and boundaries of organizational communication and power research while providing reference points for organizational virtual communication practices and virtual team management.

**Keywords:** supervisor-subordinate relationship, power cues, power configuration, virtual communication, identity construction

## 1 Research Background and Problem Statement

In the post-pandemic era, although most enterprises have gradually resumed on-site work, the trend toward remote communication and collaboration continues to be sustained and irreversible. According to the 52nd Statistical Report on China's Internet Development from the China Internet Network Information Center, as of June 2023, China's instant messaging user base reached 1.047 billion, while online office users reached 507 million, with monthly active users of virtual communication software such as DingTalk and Tencent Meeting each exceeding 100 million. Information Communication Technology (ICT) has revolutionized traditional organizational communication patterns, significantly improving the convenience and efficiency of organizational information flow (Xie

et al., 2021; Van Zoonen et al., 2021). Compared to face-to-face communication, instant messaging breaks temporal and spatial constraints, making information transmission synchronous, efficient, and traceable. Simultaneously, the use of asynchronous tools such as internal Office Automation Systems (OA) and email has formalized online information communication. With the rise of virtual teams including cross-border online teams, virtual communication methods have become further popularized, with increasing numbers of teams adopting group virtual communication modes such as video calls, voice conferences, and online discussion groups for interaction. From the present into the future, virtual communication will become the primary communication method in organizations (Van Zoonen et al., 2021).

The emergence and popularization of virtual communication have transformed organizations' original work and interpersonal interaction patterns (Shockley et al., 2021) while also affecting the construction of supervisor-subordinate power relationships (Baym, 2015; Tautz et al., 2022). In traditional face-to-face contexts, supervisors' power expression toward subordinates is direct and observable, while subordinates' feedback to supervisors' power expression is immediate and identifiable. However, in virtual communication contexts, supervisors' power expression and subordinates' power reception have undergone disruptive changes, manifested in three ways: (1) media filtering of environmental, verbal, and nonverbal information (Cramton, 2001) substantially reduces identity and power relationship cues between supervisors and subordinates; (2) asynchronous communication leads to interruptions in the process of power expression and reception; and (3) media filtering of social cues reduces social norm constraints on power relationships (Wang, 2022). Additionally, media's rehearsability and replicability increase subordinates' reaction time and space when facing supervisors' power expression, enabling possible inauthentic feedback (Tretter & Diefenbach, 2020). These factors demonstrate that virtual communication weakens traditional position-based hierarchical power configuration (i.e., the structural and psychological distribution and arrangement of power in organizations, DiTomaso & Hooijberg, 1996; Anderson & Brion, 2014), manifesting as supervisors' sense of inauthenticity when expressing power (i.e., reduced supervisor power perception) and subordinates' uncontrolled state of "the general in the field is not bound by the sovereign's command" (i.e., reduced subordinate compliance). However, which specific factors in virtual communication produce these effects? How do the characteristics and functions of ICT, as well as supervisor-subordinate information interaction and communication patterns, influence power dynamics? Addressing these questions will not only enrich existing theoretical research on ICT usage and hierarchical power configuration but also provide theoretical support for communication software design and virtual communication practices between supervisors and subordinates.

Reviewing existing research on the impact of virtual communication on supervisor-subordinate power configuration, domestic and international scholars have conducted preliminary explorations, but overall, the field remains in its infancy. First, existing research on virtual communication and ICT

usage predominantly adopts a contextual research paradigm, treating ICT as an external environment to examine the effectiveness of original leadership styles and hierarchical power configurations in this new context (Castellano et al., 2021; Mysirlaki & Paraskeva, 2020), while lacking content-based research that treats virtual communication or ICT as the research object itself. This insufficient recognition of information technology's impact on organizations constrains the development of digital intelligence management research. Second, existing research on virtual communication and hierarchical power configuration primarily focuses on the individual level, emphasizing individual differences in communication style and ICT usage and their effects (Wang et al., 2020), while lacking investigation into how information technology characteristics, media differences, and information interaction behaviors affect outcomes at the single communication event level. Individual communication events constitute the most basic unit through which leadership exerts its effects (Schoeneborn et al., 2016), and the absence of research on virtual communication events prevents clear understanding of the essential logic of supervisor-subordinate interaction in virtual contexts. Finally, while some scholars have theoretically explained the impact of virtual communication on hierarchical power configuration (Tautz et al., 2022; Oreglia & Srinivasan, 2016), systematic and detailed empirical research on specific influencing factors, mechanisms, effects, and boundary conditions remains lacking.

In light of these gaps, this study examines the effects and mechanisms of virtual communication on supervisor-subordinate power configuration, investigating how static technical cues, dynamic information behaviors, and virtual communication patterns influence supervisors' power expression and subordinates' power acceptance, and constructing a theoretical analytical framework of how virtual communication affects hierarchical power configuration. This research will expand the content of existing organizational virtualization and informatization research, achieve deep integration between information management and organizational behavior fields, and generate more interdisciplinary theoretical contributions. Practically, this study will also provide scientific foundations for the design of internal organizational communication software, the formation of virtual communication norms, and the selection of supervisor-subordinate virtual communication patterns.

### 2.1.1 Characteristics of Virtual Communication

In the information age, virtual communication has become the primary mode of information exchange and interaction in organizations. Virtual communication primarily examines the extent to which organizational members use virtual communication tools to complete work tasks, described as the boundaries that need to be crossed in communication and the means employed to cross these boundaries. Typically, boundaries to be crossed in communication include geographic or spatial dispersion, organizational, group, or cultural differences, and lack of synchronicity in working time or availability (Martins et al., 2004), or

simply the inability to achieve face-to-face communication (Fiol & O'Connor, 2005).

Due to these boundaries and cross-boundary communication technologies, virtual communication may interfere with or inhibit information transmission compared to face-to-face interaction, exhibiting the following characteristics (Mao & Chen, 2023): First, low social presence. Geographic dispersion and media limitations lead to a lack of nonverbal cues that people are accustomed to (Gkinko & Elbanna, 2022; Wang, 2022), making individuals' social personalities less detectable and noticeable (Walther, 1992) and reducing individuals' perception of both physical and social presence. Second, content richness depends on the medium. In virtual communication, higher-fidelity media such as video can partially restore face-to-face communication contexts, but in environments with single-carrier forms (e.g., instant messaging, email), nonverbal cues are fewer. Although research indicates that new cues (such as emoticons) have emerged, their interpretation and perception require more time (Blunden & Brodsky, 2021). Third, interaction timeliness depends on the communication medium. The timeliness of interaction in virtual communication relies on the characteristics of the communication medium (Daft & Lengel, 1986), with instant calls and video calls having high synchronicity, while text communication and email exhibit time lags. Fourth, high rehearsability. The asynchronous nature of virtual communication gives senders and receivers more time to select, construct, and modify messages (Tretter & Diefenbach, 2020), increasing individuals' control over expression and establishing buffering and protective mechanisms for communication.

### 2.1.2 Research Progress on Supervisor-Subordinate Communication

Thayer-Bacon (2003) notes that communication is one of the fundamental activities of all living beings and constitutes human essence. Previous research has explored the essence of supervisor-subordinate communication from different perspectives. First, the traditional leadership perspective views communication as a process in which senders transmit information to receivers, who in turn translate, interpret the information, and take action (Ruben & Gigliotti, 2016). When leaders want to achieve specific goals or disseminate particular information, communication is the most commonly used method. Based on this, Hackman and Johnson (2013) argue that leadership is a communication process that changes others' attitudes and behaviors to meet group common goals and needs, and communication failure leads to leadership failure itself. Second, the interaction perspective focuses on more complex bidirectional exchanges between senders and receivers, viewing communication as a multidirectional phenomenon (Ruben, 2003) where communication meaning emerges from two-way exchanges between leaders and subordinates rather than being controlled by leaders. Finally, the systems perspective further addresses the complexity of social influence in leadership communication processes, emphasizing how indi-

vidual differences such as needs, values, goals, styles, and current environments affect information creation, understanding, and reaction during communication, and noting that leadership communication research must examine both the immediate states of leaders and subordinates and the stable characteristics of both parties (Ruben & Gigliotti, 2016).

In specific research, scholars have primarily examined how various aspects of supervisor-subordinate communication—including quantity, quality, timing, and style—affect subsequent performance. Regarding communication quantity, research finds that increased communication frequency and interaction opportunities among organizational members provide opportunities for performance growth (Bui et al., 2019). However, from the perspective of communication overload, communication frequency's impact on performance has a threshold; when frequency exceeds this threshold, its positive effect on performance weakens or even disappears (Stephens et al., 2017). Regarding communication quality, previous research indicates that communication quality plays a more critical and direct role than communication quantity (Marlow et al., 2018). The core of communication quality is sufficient information exchange, manifested in various forms such as accuracy, openness, clarity, effectiveness, and timeliness. Regarding communication timing, some scholars argue that after-hours communication causes work boundaries to spill over into the family domain, breaking work-family balance and negatively affecting employee family-related outcomes (Derks et al., 2016). Meanwhile, research has also found that after-hours electronic communication has a double-edged sword effect on leadership effectiveness evaluation and employees' overall work attitudes (Zhang et al., 2020). Regarding communication style, existing research has conducted multidimensional classifications of interpersonal communication styles and explored leadership communication styles by connecting them with leadership behaviors; for example, Gerpott et al. (2019) proposed three types of leadership communication styles: task-oriented, change-oriented, and relationship-oriented communication.

Additionally, power-based communication in leadership represents a hot topic in supervisor-subordinate communication research. Current research on leadership power-based communication follows two main approaches: first, investigating how power affects communication processes and outcomes between leaders and subordinates, teams, and external parties; second, examining how individuals enhance their sense of power through communication or revealing the communicative manifestations of power. In the first approach, scholars distinguish between power and leadership and further explore how leadership power affects individual and team performance through communication processes. For example, research shows that a sense of power causes power holders to objectify others (Gruenfeld et al., 2008), making them poor at listening to others' opinions and understanding others' perspectives (Morrison et al., 2011). In the second approach, scholars emphasize that communication is the primary pathway through which leadership creates influence and reveal mechanisms by which leaders gain power through specific linguistic structures and styles. For

instance, regarding linguistic structure, Danescu-Niculescu-Mizil et al. (2012) found that the degree of linguistic coordination can reflect power differences between interacting parties, with leaders as high-power individuals being less likely to respond to the other party's linguistic style in interactions. Regarding linguistic effects, scholars argue that leadership communication language activates linguistic functions in specific ways to achieve leadership functions. For example, Joullié et al. (2021) contend that leadership power comes from the use of noble language, which supports critical thinking and clear communication, uses words and phrases to clarify ambiguous situations, and replaces destructive beliefs with constructive and self-promoting ones, thereby gaining power by presenting a better self to the audience.

### 2.1.3 Research Progress on Virtual Supervisor-Subordinate Communication

Research on virtual supervisor-subordinate communication has primarily followed three approaches. The first approach treats virtual teams as a context to examine how traditional supervisor-subordinate communication quantity and quality affect leadership emergence and effectiveness. Specifically, researchers apply traditional communication models such as the “sender→message→receiver” model (Shannon & Weaver, 1949), treating communication as a dimension of the leadership process to investigate its impact on leadership effectiveness in virtual contexts. Meanwhile, existing research focuses on differences between traditional leadership styles in online and offline communication and actively explores the effects of leadership virtual communication on subordinates and teams (Huffaker, 2010). Additionally, the relationship between virtual communication style and leadership emergence has attracted scholarly attention. For example, Charlier et al. (2016) found that text communication ability and communication apprehension significantly affect leadership emergence in virtual teams.

The second approach treats information and communication technology as the research object, investigating how supervisors' ICT use affects subordinates' attitudes and behaviors. ICT refers to “any electronic device or technology capable of collecting, storing, or sending information” (Day et al., 2012). Previous research finds that leadership ICT use significantly affects employee ICT use, work efficiency, and well-being. For example, Tautz et al. (2022) note that leadership ICT use affects the reconstruction of leader-subordinate relationships in scenarios such as remote work, where leaders face issues including blurred work boundaries, difficulty contacting subordinates, increased management challenges, and reduced sense of control. When and how leaders use ICT devices to communicate with subordinates affects employees' identification with leadership identity, which further determines leadership effectiveness. Li et al. (2022) explored the impact of leaders' after-hours ICT use on subordinate work performance based on conservation of resources theory. Solberg et al. (2024) point out that when leaders have fixed mindsets about ICT use, they find it difficult to change or

improve their proficiency with new technologies, consequently investing less effort in providing developmental support for employees, which affects employee ICT use.

The third approach treats virtual communication as a dimension of leadership, investigating how e-leadership affects subordinates and teams. E-leadership is a social influence process mediated by advanced information technology that produces changes in attitudes, emotions, thinking, behaviors, or performance among individuals, groups, or organizations (Avolio et al., 2001). Many scholars have explored the effects of e-leadership. For example, Tang et al. (2017) proposed that e-leadership has a significant positive effect on employee job satisfaction. Liu et al. (2018) argued that e-leadership positively affects perceived organizational support and employee engagement, and has a positive impact on team job crafting. However, Kulshreshtha and Sharma (2021) found that excessive use of information communication technology or social applications hinders leadership effectiveness and organizational culture operations, arguing that e-leadership cannot replace face-to-face interactive leadership and that e-leadership also needs to comply with necessary norms.

### 2.2.1 Research Progress on Power

Power develops from social relationships and constitutes a fundamental driver of human behavior (Scholl & Sassenberg, 2015). The narrow concept of power emphasizes leadership authority formed by organizational hierarchical structure, while the broad concept includes various dependency relationships in social systems (Martin, 1971). The connections and dependencies formed when members access social and material resources constitute the foundation of leader-subordinate structures (Magee & Galinsky, 2008). Power is not only a structural variable based on ability and resources (i.e., structural power) but also an activatable cognitive experience, namely “psychological sense of power” (Anderson et al., 2012). Power cues affect the activation process of power perception and produce different power effects accordingly (Anderson & Galinsky, 2006). Meanwhile, the sense of power is a dynamic process influenced by individual traits and social psychological factors (Anderson & Brion, 2014). For example, research finds that supervisors’ sense of power fluctuates within days and between individuals, producing different effects on emotions and team performance (Sabey et al., 2021).

In supervisor-subordinate relationships, supervisors’ power expression can be summarized as indirect power cues and direct power behaviors. First, leadership power expression cues mainly include objective environmental cues and subjective performance cues. Objective environments refer to both abstract organizational structural positions and concrete work environments. For example, Giessner and Schubert’s (2007) research found that vertical spatial distance of individuals in organizational structures can affect perceptions of power magnitude, with greater vertical distance leading subordinates to evaluate leadership power as greater. Caza et al. (2011) elaborated on different physical environmental

cues that express leadership power in organizations, with some organizations displaying power differences among individuals by providing luxurious offices separate from groups, high-end technical equipment, special parking spaces, etc. Regarding subjective power performance, verbal and nonverbal behaviors are important cues for leadership power expression. For instance, Hall et al.'s (2005) meta-analysis found that speaking volume, pitch, and vocal frequency affect perceived leadership power. Shariff et al. (2012) noted that high-power leaders display their power through less smiling, more gazing, frequent gestures, and conversational interruption. Additionally, exaggerated body postures and calm, relaxed interaction attitudes have been proven to increase others' power perception (Anderson et al., 2012).

Supervisors' power expression behaviors are mainly reflected in communication styles and management approaches. Communication styles are often linked to language styles. For example, Caza et al. (2011) summarized that leaders more frequently use commanding language styles while subordinates more frequently use submissive language. Tost et al. (2013) found that leaders often use dominant language in communication to express and enhance power. Management style is another important aspect of leadership power expression. For example, Lawrence et al. (2012) used case studies to summarize that leaders adopt "episodic" and "systemic" power approaches to advance organizational change development. Research by Chen et al. (2014) and Sweeney et al. (2019) noted that leaders' power-sharing behavior, as a prominent feature of shared leadership, expands the subject of power expression from individuals to collectives and has many positive implications for enhancing leadership authority.

The effects of leadership power expression are mainly reflected in proximal expression effectiveness evaluation and distal subordinate behavior and organizational performance. Regarding leadership power expression effectiveness, high-power leaders control both positive (e.g., rewards, promotion opportunities) and negative (e.g., difficult tasks) resources in organizations and have significant advantages in implementing control and making decisions; therefore, subordinate evaluation and organizational performance are the main criteria for measuring effectiveness (Mcclanahan, 2020). Regarding the impact of leadership power expression on subordinates, current scholars mainly explore the relationship between power and subordinate performance, as well as positive and negative behaviors (Rong et al., 2022). For example, Qu et al.'s (2019) research found that when subordinates have low power values, authentic leaders with strong power values can promote subordinate performance. Urbach and Fay (2021) pointed out that when voice is attributed to self-serving intentions and threatens leaders' power, employees' voice behavior is suppressed, while high-quality leader-member exchange relationships can buffer this effect.

### 2.2.2 Research Progress on Supervisor-Subordinate Power Configuration and Reconfiguration

In organizational vertical relationships, supervisors are endowed with certain position-based powers, enabling them to exercise reward, coercive, and legitimate powers over their subordinates. Correspondingly, role norms and legitimacy concepts regarding organizational hierarchy make subordinates power recipients (Xu & Cao, 2015). However, in management practice, subordinates do not always completely accept leadership power. Related research has confirmed that subordinate feedback regarding leadership power involves both active and passive acceptance scenarios. In the first scenario, subordinates actively follow leaders due to factors such as leadership charisma and their own lack of ability, becoming active power acceptors (Bastardo & Van Vugt, 2019). After accepting supervisory power, subordinates exhibit compliance, voice, and other behaviors (Li et al., 2020), with compliance being a typical manifestation of power acceptance (Ling et al., 2019).

In the second scenario, even when employees do not recognize their leaders, they may become passive power acceptors due to constraints from leaders' titles and power. In this case, subordinates typically exhibit negative and resistant behaviors. Tepper et al. (2001) noted that subordinate resistance mainly includes constructive resistance behaviors (expressing opinions on leadership power distribution, challenging authority) and dysfunctional resistance behaviors (passive neglect of work assigned by leaders, such as refusing to accept leadership assignments through lying, claiming busyness, or feigning forgetfulness). Scholars point out that the reasons for subordinate power non-acceptance or passive/follower ineffectiveness/failure include leader-follower fit dilemmas (Uhl-Bien et al., 2014), encompassing psychological dilemmas such as expectation perception bias and emotional exhaustion, resource dilemmas such as lack of material and work resources, and behavioral dilemmas such as making more commitments and assuming more responsibilities (Peng & Wang, 2018).

In mature organizational structures, hierarchical power structures are determined by position power and thus generally have relatively stable power configurations. When power relationships are stable, organizational policies, hierarchical systems, and interdependent relationships help balance internal competition and cooperation (Anderson & Brion, 2014). However, in certain situations, power becomes ambiguous and imbalanced. For example, in novel, complex, or uncertain situations, power may become ambiguous and trigger power struggles due to individuals' focus on their own interests (Aime et al., 2014). Previous research indicates that power struggles can be resolved through various means, including facilitative strategies such as negotiation and oppositional strategies such as dismissal (Zuzul, 2019).

Power reconfiguration refers to the structural and psychological redistribution and rearrangement of power within organizations. First, power reconfiguration is relatively obvious in teams. For example, team power reconfiguration mani-

ests as power struggles or status conflicts among members, referring to processes where multiple members compete for resources, win status, and gain dominance (Greer et al., 2017). Existing team research has revealed various influencing factors of power struggles, such as demographic diversity, functional diversity, high demand for power, organizational hierarchy, team levels, and external threats (Greer & Van Kleef, 2010). Research shows that team power struggles reduce team performance by decreasing cooperation and increasing conflict (Greer et al., 2017). Second, organizational power reconfiguration also occurs in organizational change contexts. In change management, previous scholars have revealed the dynamics and reconfiguration of power in changing organizations by exploring power transitions, power negotiations, and power reconstructions. Research indicates that power reconfiguration possibilities increase when ambiguity or uncertainty exists (Gross & Zilber, 2020). For example, new technologies may reduce the importance of individual expertise or even cause complete loss of expert power. Finally, recent research also shows that individual communication styles affect power reconfiguration. For instance, group communication activities such as seminars and coordination meetings are important for resolving power ambiguity (Gross & Zilber, 2020). Meanwhile, when individuals adopt affiliative communication practices such as inviting others to express opinions or affirming others, cooperation increases and breakthrough solutions are promoted. Conversely, when individuals exhibit authoritative and aggressive dominant communication styles, power conflicts and opposition arise, leading to communication failure (Zuzul, 2019).

### **2.3 Literature Review on Virtual Communication and Supervisor-Subordinate Power Configuration**

Based on the systematic review and summary of relevant research on virtual communication and supervisor-subordinate power configuration above, this study further identifies limitations and shortcomings in existing research.

First, existing organizational virtual communication research primarily adopts a contextual research paradigm, lacking content-based research that explores the direct impact of virtual communication on traditional work patterns and power relationships. With the popularization of ICT in organizations, scholars have begun to focus on how informatization and digital intelligence impact traditional intra-organizational work and interpersonal interaction patterns. However, existing research mostly treats ICT as an external environment to examine the effectiveness of original organizational models in this new context (e.g., Ben Sedrine et al., 2021; Castellano et al., 2021). Yet information and digital technologies not only affect the effectiveness of original work patterns but also create new patterns. Therefore, research needs to shift from a contextual perspective to a content perspective, deeply exploring the direct impact of new technologies on organizational work and interaction patterns to construct new intra-organizational ecosystems.

Second, existing research on supervisor-subordinate ICT usage is primarily

based on an organizational behavior psychological perspective while neglecting the technical perspective of information systems. Current research mainly focuses on ICT usage characteristics such as ICT climate (Day et al., 2010) and after-hours ICT use (Li et al., 2022) and their impact effects on oneself and others, paying less attention to how ICT's own technical characteristics, media characteristics, and information interaction characteristics affect users' attitudes and communication outcomes (Sun & Xu, 2023). ICT is a concept and technology originating from the information systems field. Neglecting its technical characteristics while focusing only on its functions in organizations may cause researchers to miss critical information and result in ICT functions lacking underlying logic. Therefore, future research needs to examine how ICT technical features such as interface layout and icons, media differences such as instant messaging versus video calls, and interactive behaviors such as information sending and receiving affect communication effectiveness among organizational members.

Third, existing organizational communication research concentrates on exploring how leadership communication characteristics affect subordinate and team performance, lacking investigation from linguistic and communication perspectives into how communication content such as language structure and nonverbal cues affects leadership and leadership power. Current research focuses more on individual communication characteristics such as communication style, frequency, and quality, lacking detailed analysis of each communication event. The Communicative Constitution of Organization (CCO) perspective posits that communication constitutes the most basic unit through which leadership produces effects, as most leadership influence is conveyed and exerted through communication processes (Schoeneborn et al., 2016). Therefore, future research needs to examine from the event-episode level how verbal and nonverbal interactions between supervisors and subordinates during communication processes affect communication outcomes and ultimately influence the effective exertion of leadership and leadership power.

Finally, existing research based on traditional organizational hierarchy perspectives considers supervisor-subordinate power configuration relationships relatively stable, paying little attention to dynamic changes and reconfiguration of hierarchical power. Currently, research on power reconfiguration mainly focuses on team and organizational change contexts, with scholars focusing on revealing how internal conflicts, power struggles, and power ambiguity trigger new power configuration relationships (Van Bunderen et al., 2018; Zuzul, 2019). For supervisors and subordinates, the traditional hierarchy perspective considers their power configuration relationships relatively stable. However, with the widespread use of information and digital technologies in organizations, traditional supervisor-subordinate relationships have experienced many disruptive changes. Tautz et al. (2022) also point out that ICT reconfigures supervisor-subordinate power relationships, with supervisors experiencing difficulties in contact, increased management challenges, and reduced sense of control when remotely managing subordinates through ICT tools. Therefore, in new digital

intelligence contexts, the possibility of power relationship reconfiguration exists between supervisors and subordinates, and future research needs to focus on hierarchical power changes and fluctuations.

### 3 Research Framework

To explore the impact and shock of information and communication technology in organizations from multidisciplinary and multi-perspective approaches, this study investigates from an organizational communication perspective how virtual communication affects supervisor-subordinate power configuration mechanisms and effects. Virtual communication is examined from three aspects: static cues, information interaction behaviors, and virtual communication patterns. Supervisor-subordinate power configuration focuses on the distribution and arrangement of power in organizations (DiTomaso & Hooijberg, 1996; Anderson & Brion, 2014), encompassing both structural power arrangements (e.g., the continuation and reconstruction of hierarchical power relationships) and psychological power fluctuations (e.g., changes in supervisor power perception and subordinate compliance). By integrating perspectives from information systems, leadership, and communication disciplines, this study expands the content and scope of organizational communication research, providing foundations for organizations to establish and improve internal virtual communication norms.

To achieve research objectives, this study introduces identity theory perspectives to explore how virtual communication affects how supervisors and subordinates construct self-identity and other-identity, ultimately changing hierarchical power configuration. Previous self-concept and power theories indicate that identity changes trigger power changes (DeRue & Ashford, 2010). For example, when an individual becomes or perceives themselves as a leader, their sense of power increases. Identity is a key component in how individuals define themselves, and together with self-concept constitutes the “self” (Epitropaki et al., 2017). Leader identity is a component of individuals’ work self-concept, referring to self-cognition regarding leadership patterns, leadership experiences, and future performance as a leader, describing whether and how individuals perceive themselves as leaders (Haslam et al., 2022). Similarly, follower identity is also a component of individuals’ work self-concept, referring to self-cognition regarding follower schemas, follower experiences, and future performance as a follower (Epitropaki et al., 2017). Leadership and followership identity theory (DeRue & Ashford, 2010; Epitropaki et al., 2017) posits that the degree of construction and identification with self and other identities determines “who leads” and “who follows,” i.e., the psychological configuration of hierarchical power.

Supervisor-subordinate identity self-construction and mutual construction are measured through identity identification levels, specifically including: first, supervisor-subordinate identity self-identification, where supervisors identify and claim “I am a leader” (Study 1a) and subordinates identify and claim “I am a follower” (Study 1b); second, supervisor-subordinate identity mutual identification, where subordinates identify and acknowledge “the supervisor is my

leader” (Study 2a) and supervisors identify and acknowledge “the subordinate is my follower” (Study 2b); and finally, supervisor-subordinate identity relationship identification, where both parties identify and acknowledge they belong to a leader-follower relationship (Study 3). The overall research framework of this study is shown in Figure 1 [Figure 1: see original paper].

### **3.1 Study 1: Static Power Cues and Psychological Power Configuration from Identity Self-Construction Perspective**

Study 1 primarily examines whether static power cues brought by ICT can affect supervisor-subordinate power configuration by influencing supervisors’ and subordinates’ identity self-construction. Power cues are explicit or implicit external manifestations of power (Giessner & Schubert, 2007), typically divided into external environmental cues and technical cues endowed by objective conditions, and verbal and nonverbal cues used subjectively by individuals (Shariff et al., 2012). Leaders have internal power representations, and their sense of power is consciously or unconsciously activated when power cues appear, producing power effects (Anderson & Galinsky, 2006). Simultaneously, subordinates also have personal power cues directly related to power perception, which importantly affect their own identity cognition and behavior. Therefore, power cues are important sources of identity and power cognition for both leaders and followers. Since physical environmental cues are invisible in text-based, voice-based, and other media-based virtual communications and difficult to affect hierarchical power cognition, this study focuses on technical, verbal, and nonverbal power cues. The theoretical model of Study 1 is shown in Figure 2 [Figure 2: see original paper].

#### **3.1.1 Technical Cues, Identity Self-Identification, and Psychological Power Configuration**

With the popularization of virtual communication in organizations, technical features carried by communication media endow leadership power cues with new manifestations. First, software such as Enterprise WeChat sets corresponding communication permissions based on organizational hierarchy. The concept of permission originates from informatics, referring to the scope and degree of access to users’ private information and key resources (Qi et al., 2018). By setting differential access and control permissions for different users, communication software can effectively assign system levels to communication media (Rashid et al., 2021). Second, platforms such as Feishu can clearly present the architecture of organizational hierarchies. Previous research indicates that spatial position (e.g., height, portrait height of leaders) is an important cue for judging individual hierarchical status and power magnitude (Schubert, 2020). The intelligence of office applications enables organizational structures to be presented graphically or hierarchically in virtual platforms, giving individuals more intuitive and concrete perception of their positional information in organizations. Communication permission and organizational structure display

settings will affect power perception by strengthening hierarchical identity cognition. First, communication permissions make organizational members aware of their advantageous or disadvantageous positions in asymmetric control (Magee & Galinsky, 2008), activating members' self-schemas regarding leadership or follower concepts, strengthening members' self-identification with original role concepts, and thereby activating power cognitive processing and affecting power perception evaluation (Anderson et al., 2012). Second, software display of organizational structure increases members' contact frequency with organizational structure information, triggering members' psychological schemas about self-ranking and making them experience more prominent and intense role identity feelings (Day & Sin, 2011), thereby strengthening members' concrete perception of self and others' power spatial positions and triggering associations about their power magnitude. Thus, the following hypothesis is proposed:

**Hypothesis 1-1:** Technical cues in ICT software affect supervisor-subordinate psychological power configuration through identity self-identification. Specifically, communication permissions and organizational structure display enhance supervisor power perception through supervisors' leader identity identification and enhance subordinate compliance through subordinates' follower identity identification.

### 3.1.2 Language Cues, Identity Self-Identification, and Psychological Power Configuration

Language is a relatively direct power expression method for leaders, with power-related language cues including language quantity and language style (Tost et al., 2013). Regarding language quantity, less language quantity implies that the expresser has a unique and advantageous communication position and can reflect communication dominance and influence, which strengthens supervisors' internal leader cognitive schemas (Derue & Ashford, 2010). Conversely, more language quantity implies more explanation and clarification, with higher perceived dominatedness and instrumental role, making members more likely to match this experience with follower identity schemas. Regarding language style, language empowerment behavior refers to language behaviors related to implementing power and influence, such as appointment, election, command, and urging. Language empowerment behavior carries dominance and control implications, reflecting members' self-control and influence (Austin, 1962), which aligns with the leadership dominance cognition in leader identity schemas and enhances leader identity self-identification. Conversely, emoticon usage is generally a language compensation behavior implemented to avoid communication ambiguity, reflecting individuals' emphasis on accurate communication of information (Riordan & Glikson, 2020). In interpersonal interactions, emoticon usage, type, position, and content significantly affect communication efficiency and evaluation between interacting parties (Kaye et al., 2016; Butterworth et al., 2019). For example, when members use more emoticons, excessive emphasis on information transmission reflects lower control over resources, thus reducing

perceived power. Thus, the following hypothesis is proposed:

**Hypothesis 1-2:** Language cues affect supervisor-subordinate psychological power configuration through identity self-identification. Specifically, less language quantity and language empowerment behavior use enhance supervisor power perception through supervisors' leader identity identification, while more language quantity and emoticon use enhance subordinate compliance through subordinates' follower identity identification.

### 3.1.3 Nonverbal Cues, Identity Self-Identification, and Psychological Power Configuration

Compared to face-to-face communication, virtual communication often lacks visible visual cues, reducing social presence and individual identity salience (Reicher et al., 1995). In virtual environments, individuals construct and maintain personal images through webpage expressivity (e.g., avatars, titles) and webpage self-disclosure (e.g., posting personal viewpoints) (Weisbuch et al., 2009). In organizational virtual communication processes, due to ICT interface settings, interacting parties can only display role or personal information through limited interface expressions (avatars and titles), so individuals' self-disclosure decisions first involve choosing information types—i.e., selecting whether to display work role-related or personal information—and second involve choosing specific disclosure content. Employees' choices regarding role and personal information type disclosure affect the degree of recognition of personal and organizational identity.

Role labels are unique identifiers formed by individuals' roles and responsibilities in organizations, usually combined with position levels. For example, DingTalk can set role labels based on professional positions such as "Product Manager" or based on management functions such as "Regional Manager." Role labels are closely related to identity and organizational status hierarchy and constitute a basic way to classify oneself and the collective (Gonibeed & Saqib, 2023). Role labels displaying hierarchical information enable individuals to identify their own and others' positions in organizational structures, thereby judging their hierarchical status in organizations (Schubert, 2020) and affecting power cognition. Different from role labels, personal labels are text and image descriptions that individuals can freely set, partially displaying personal characteristics, hobbies, and habits, such as using anime avatars or non-mainstream nicknames. In organizational virtual communication, reduced physical presence increases interaction anonymity and reduces inter-individual differences, presenting de-individualized characteristics of communicating individuals (Reicher et al., 1995). Therefore, personal labels become important identity cues for organizational members to highlight individuality in virtual communication, with members often adopting positive self-presentation strategies to manage their identities and establish good personal images (Brown et al., 2016). Sluss and Ashforth (2007) argue that personal-based identity characteristics affect role-based identity characteristics. When subordinates autonomously set content

displayed in personal labels, they perceive high control and freedom over disclosing identity cues without needing others' permission or other resources (Blader & Chen, 2012). This high control and freedom can activate their identity cognitive schema processing, which contradicts the more restricted, lower-freedom state in the follower ideal schema, hindering subordinate follower identity construction and reducing identification with their follower identity. Further, this lower identity identification increases subordinates' own sense of power and results in fewer objective compliance behaviors (Epitropaki et al., 2017).

Image display refers to individuals actively or passively disclosing self-image-related information on communication platforms, including using real-person avatars or turning on cameras in video conferences (Bazarova & Choi, 2014). Proactive image display is a form of identity declaration and exhibition (Derue & Ashford, 2010), which can be gradually internalized and strengthened as power representation through this identity salience and higher freedom, thereby strengthening individuals' power perception. Conversely, passive image display due to obedience to commands or group norm pressure makes members recognize they are in a dominated lower position, activating identity cognition consistent with followers' high compliance and low freedom (Derue & Ashford, 2010) and reducing members' sense of power. Thus, the following hypothesis is proposed:

**Hypothesis 1-3:** Nonverbal cues affect supervisor-subordinate psychological power configuration through identity self-identification. Specifically, in organizational virtual communication contexts, role labels and proactive image display enhance supervisor power perception through supervisors' leader identity identification, passive image display increases subordinate compliance through subordinates' follower identity identification, and personal labels reduce subordinate compliance through subordinates' follower identity identification.

Furthermore, when discussing factors affecting supervisor-subordinate identity self-identification, Derue and Ashford (2010) note that employees compare their own characteristics with implicit theories about prototypical attributes of leaders and followers. If the match is stronger, employees are more likely to claim leader or follower identities in social interactions because individuals tend to act authentically according to self-views and aim to make others' views of them consistent with self-views (Foote, 1951; Swann et al., 2002). Based on this, we argue that supervisor leadership prototypes and subordinate power distance, as implicit theories of leaders and followers respectively, will moderate the effects of power cues. Specifically, for supervisors with high leadership prototype matching, the effect of power cues on enhancing their leader identity identification will be strengthened. For example, when supervisors have dominant leadership prototypes, the match with the asymmetric control and influence implied by power cues is higher, making supervisors more affirmative and identified with their leader identity, thereby promoting positive cognition of their own power perception. When subordinates have low power distance, they expect more equal power distribution in organizations. Higher power cues and restrictions contradict their original cognitive schemas and value expectations,

and this contrast amplifies individuals' sense of unfairness, thereby weakening their identification with their follower identity and reducing their perception of and compliance with supervisory power.

### **3.2 Study 2: Information Interaction and Psychological Power Configuration from Identity Mutual Construction Perspective**

Study 2 examines how information interaction behaviors affect supervisor-subordinate power configuration by influencing mutual identity construction between supervisors and subordinates. As organizations increasingly rely on digital platforms such as DingTalk and Enterprise WeChat for communication and information transmission, online information interaction has become an important interaction mode for organizational members. In online interactions, information sending and replying are the most commonly used communication behaviors, whose content and form not only display individuals' identities externally but also importantly affect identifying and constructing others' identities. Mutual identity construction determines how interacting parties define themselves and each other and significantly affects both parties' attitudes and behaviors (Ishaq et al., 2022). The theoretical model is shown in Figure 3 [Figure 3: see original paper].

#### **3.2.1 Information Sending, Identity Mutual Identification, and Psychological Power Configuration**

Information sending and replying behaviors belong to electronic communication behaviors, i.e., behaviors that rely on ICT for communication. Although every receiver becomes a sender when replying or sending messages, this study mainly considers the initial initiator of communication behavior as the information sender and the responder or feedback provider as the information replier. First, regarding information sending timing, supervisors' task-related information sending during non-work hours increases subordinates' work pressure and emotional exhaustion (Becker et al., 2021), reflecting to some extent supervisors' lack of empathy or tendency toward abusive management, making subordinates subjectively unwilling to grant them leader identity, with compliance behaviors correspondingly decreasing. Similarly, subordinates' information sending at inconvenient times (e.g., late night) interferes with supervisors' normal rest and may be viewed as disrespectful behavior, making supervisors question the behavioral normativeness of these subordinates and reducing recognition of their follower identity. When supervisors' identification with subordinates' follower identity is low, the perceived status difference between supervisors and subordinates weakens, reducing supervisors' sense of power. Additionally, both subordinate challenges to authority and low follower identity identification trigger supervisors' power maintenance behaviors, such as abusive management or electronic monitoring (Bernstein, 2017).

Second, regarding information sending content and media matching, the study focuses on single communication events and explores the impact of media information transmission capacity in supervisor-subordinate interactions based on media richness theory. Media richness theory posits that when task demands match media richness, task performance improves (Daft & Lengel, 1984). For example, deterministic tasks (e.g., procedural tasks) achieve highest performance when using lean media communication, while ambiguous tasks (e.g., creative tasks) achieve highest performance when using rich media communication. Since organizational members' choice of one medium over another to transmit certain information is itself a decision based on their relationship, constituting part of constructing self and others' social identities (Gershon, 2010), supervisor-subordinate choices of which medium to use for task information transmission affect each other's identity identification. This study argues that using matched media for information sending reflects both the sender's work ability and their preference for order/rules. Therefore, high media-task matching in supervisor-subordinate information sending enhances mutual identity identification, thereby affecting both parties' psychological power configuration. Thus, the following hypotheses are proposed:

**Hypothesis 2-1:** Information sending timing affects supervisor-subordinate psychological power configuration through identity mutual identification. Specifically, when supervisors send task information during non-work hours, subordinates' identification with supervisors' leader identity decreases, thereby reducing compliance; when subordinates send information at inconvenient times, supervisors' identification with subordinates' follower identity decreases, thereby reducing supervisors' sense of power.

**Hypothesis 2-2:** Information sending content and media matching affect supervisor-subordinate psychological power configuration through identity mutual identification. Specifically, higher matching enhances mutual identity identification between supervisors and subordinates, increasing both supervisor power perception and subordinate compliance.

### 3.2.2 Information Replying, Identity Mutual Identification, and Psychological Power Configuration

Information sending initiates communication events, largely setting communication time, targets, and media, displaying senders' media preferences for information transmission and reply expectations, and laying the foundation for information replying. Like information sending, information replying characteristics also affect interacting parties' mutual identity identification (Byron, 2008). First, information reply delay reflects the waiting time for information receivers and significantly affects mutual identity identification. For example, supervisor reply delays trigger subordinates' dissatisfaction or anxiety (Kato et al, 2020), reducing subordinates' evaluation of supervisors' problem-solving ability and professionalism, thereby decreasing identification with their leader identity. Similarly, subordinates' immediate information replies demonstrate

a “standing by” state, satisfying leaders’ power needs to control others as superiors, and are viewed by leaders as manifestations of subordination, thus enhancing identification with these subordinates’ follower identity. Additionally, immediate replying is a harsh power tactic that restricts freedom; subordinates’ accommodation to this requirement may not stem from approving these tactics but from having to comply with them (Tesi et al., 2019). This compliance powerfully maintains hierarchical systems within organizations, reflecting identity requirements as subordinates, and thus enhances supervisors’ identification with subordinates’ follower identity.

Second, media changes and switches in information replies violate senders’ media expectations and affect senders’ cognition and attitudes toward repliers. As polymedia gradually becomes popularized in organizations, repliers may use different media from senders for information replying, resulting in different communication media within the same communication event. Communication media changes and switches are influenced not only by communication content but also reflect cognitive differences between communicating parties regarding the importance and urgency of the same event (Caughlin & Sharabi, 2013). Media enrichment refers to upgrading from lean media communication to rich media communication, such as changing from text messages to video communication. Compared to media degradation (from rich to lean media), media enrichment requires additional effort from information repliers and is deliberately implemented by individuals, thus better reflecting the cognitive and attitudinal logic behind behavioral changes. When replying to information, supervisors’ media enrichment enhances subordinates’ task importance perception (Caughlin & Sharabi, 2013) and can further transmit relational information, helping subordinates more accurately identify supervisors’ leader identity, thereby enhancing subordinate compliance and task performance. Conversely, when subordinates reply to supervisors through media enrichment, supervisors may believe subordinates have broken established media expectations, thereby questioning subordinates’ follower identity. Thus, the following hypotheses are proposed:

**Hypothesis 2-3:** Information reply delay affects supervisor-subordinate psychological power configuration through identity mutual identification. Specifically, higher delay weakens mutual identity identification between supervisors and subordinates, reducing both supervisor power perception and subordinate compliance.

**Hypothesis 2-4:** Information reply media enrichment affects supervisor-subordinate psychological power configuration through identity mutual identification. Specifically, supervisors’ media enrichment replies enhance subordinates’ identification with supervisors’ leader identity, increasing subordinate compliance; subordinates’ media enrichment replies reduce supervisors’ identification with subordinates’ follower identity, decreasing supervisors’ sense of power.

Identity construction theory posits that when individuals are recognized as a certain identity by a broader collective, the construction of that identity (including

both individuals' self-identity claims and others' identity grants to individuals) becomes more solid and stable (DeRue & Ashford, 2010). In workplaces, communication effectiveness among organizational members is constrained by team and organizational norms (Barry & Fulmer, 2004). When supervisor-subordinate information sending and replying behaviors conform to team virtual communication norms, it indicates that members are constraining personal behavior according to role function norms assigned by the team, enhancing the credibility and visibility of members' identity information and increasing mutual identity identification between supervisors and subordinates. Therefore, team virtual communication norms moderate the impact of supervisor-subordinate information interaction on power configuration.

### **3.3 Study 3: Virtual Communication Patterns and Structural Power Configuration from Relationship Identification Perspective**

Study 3 examines how virtual communication patterns affect supervisor-subordinate relationship identification and power relationship continuation. Supervisor-subordinate relationships describe social exchange and interpersonal connections between leaders and subordinates in organizations. Among these, exchanges and connections regarding work performance and resource returns formed based on work scope and requirements are typically called task-based supervisor-subordinate relationships, while emotional connections built on the basis of work relationships that emphasize private emotions and special connections are called affective-based supervisor-subordinate relationships (Chen et al., 2009; Miao et al., 2020). Relationship identification theory posits that relationship identification exists within leader-subordinate relationships, based on the degree of recognition of role relationship identities by both parties (Sluss & Ashforth, 2007). High "supervisor-subordinate" identity identification means the relationship between supervisors and subordinates is clear, with both parties having consistent cognition of each other's identities. Meanwhile, relationship identification theory emphasizes that subordinates evaluate supervisor-subordinate relationships, including both role identity evaluation of whether leaders can fulfill prescribed responsibilities and personal identity evaluation related to personal charisma. When subordinates have positive evaluations of leaders' identities and find this role relationship attractive, it promotes subordinates' supervisor-subordinate relationship identification (Sluss & Ashforth, 2007; Hong & Mao, 2021). The theoretical model is shown in Figure 4 [Figure 4: see original paper].

In the current polymedia environment, individuals' rational choices about which medium and communication style to use to transmit information to others determine their expectations and construction of the relationship (Madianou & Miller., 2013). For example, when individuals choose more types or richer communication media when communicating with others, it means they have more needs for this relationship. On the other hand, individuals' communication me-

dia choices also transmit relational signals to others, implying relationship type and importance (Baym, 2015). Thus, communication pattern choices between interacting parties affect each other's relationship cognition and ultimately influence relationship development and continuation.

Regarding employees' media usage in work interactions, previous research has often used the concept of electronic communication degree (Hill et al., 2014), measuring the relative degree of online and offline communication through the proportion of online communication. To further theoretically distinguish differences among different online communication methods and explore how combinations of different communication styles affect supervisor-subordinate relationship identification and structural power configuration, this study measures virtual communication patterns as categorical variables, drawing on electronic communication degree measurement methods to effectively distinguish communication types both theoretically and empirically. Compared to the electronic communication degree concept, virtual communication patterns can further reveal differential impact effects of different online communication methods theoretically and effectively respond to practical needs for exploring the effectiveness of organizational communication style combinations in polymedia environments. Specifically, based on usage frequency and combination patterns of different communication methods, this study categorizes supervisor-subordinate communication patterns into four types: traditional type dominated by offline face-to-face communication, hybrid type with similar online and offline communication frequencies, diverse type dominated by combined use of multiple online media including instant messaging, telephone, and video conferencing, and concise type dominated by online text-based communication such as instant messages and email.

In diverse and concise types dominated by online communication, geographic separation between communicating parties eliminates physical nonverbal cues relied upon for emotional exchange, reducing information cue richness in communication and creating difficulties for emotional expression and accurate transmission (Wang, 2022). Meanwhile, emotional misinterpretation frequently occurs and is difficult to clarify promptly, which is not conducive to supervisor-subordinate emotional exchange. Compared to diverse type communication, hybrid type communication has similar online and offline communication frequencies, with regular offline contact partially compensating for the lack of emotional exchange in online communication. The degree of emotional connection between supervisors and subordinates is higher than in diverse type but lower than in traditional type, thus hybrid type communication has higher affective relationship identification than diverse type but lower than traditional type. Concise type communication uses text as the output carrier, with information cue richness far lower than hybrid type communication that uses multiple methods including telephone, video, and text (Daft & Lengel, 1986). This communication pattern makes emotional connection establishment more difficult than in diverse type communication, resulting in the lowest supervisor-subordinate affective relationship identification. Thus, the following hypothesis

is proposed:

**Hypothesis 3-1:** Virtual communication patterns affect supervisor-subordinate power relationship continuation and regeneration through affective relationship identification. Specifically, traditional type communication has the highest affective relationship identification, followed by hybrid type, diverse type, and concise type.

In individuals' rational choice of communication patterns to construct relationships with others, communication difficulty is an important cost consideration (King & Xia, 1997). When the method to achieve a goal is costly but individuals are still willing to implement it, it demonstrates that the goal is important to them. In the process of constructing affective-based relationships between supervisors and subordinates, geographic distance refers to the physical proximity between leaders and subordinates (Lauring et al., 2022), representing the difficulty of supervisor-subordinate affective communication. Greater geographic distance makes face-to-face communication more difficult, with both parties mainly conducting work-related communication online and having fewer opportunities for emotional exchange (Van Zoonen et al., 2021). Hybrid communication adopts online and offline communication patterns with similar frequencies; greater geographic distance makes both parties perceive offline communication opportunities as more precious, value and seize each offline communication opportunity more, and engage more proactively in personalized interactions to enhance interpersonal relationships and emotional connections (Lauring et al., 2022). High-quality interactions beyond expectations make subordinates' evaluations of leaders' role identities increasingly positive, thereby forming stronger affective relationship identification. Therefore, greater geographic distance can enhance the positive effect of hybrid communication on affective relationship identification. When geographic distance is smaller, face-to-face communication difficulty decreases, and both parties perceive more offline communication opportunities and have higher expectations for building intimate interpersonal relationships (Knop et al., 2016). In this situation, supervisor-subordinate pairs using concise communication patterns have daily communication limited more to work-related instrumental communication, with text-based information carriers also restricting personalized expression and emotional transmission. This contradicts high-expectation motivations for building interpersonal relationships, making subordinates more likely to form cognitions that supervisors cannot provide interpersonal support and personalized care, and evaluate leaders' personal identities more negatively, resulting in lower affective relationship identification. Therefore, smaller geographic distance strengthens the negative effect of concise communication on affective relationship identification.

**Hypothesis 3-2:** Supervisor-subordinate geographic distance moderates the effect of virtual communication patterns on supervisor-subordinate relationship identification. Specifically, greater supervisor-subordinate geographic distance strengthens the positive effect of hybrid communication on affective relationship identification; smaller supervisor-subordinate geographic distance strengthens

the negative effect of concise communication on affective relationship identification.

Based on rational choice perspective, supervisor-subordinate task-based relationship construction is also affected by the interaction between virtual communication patterns and task communication difficulty. When task complexity is high and causes communication difficulty, hybrid communication patterns can effectively balance communication quality and cost (Cernikovaite & Karazijiene, 2023), benefiting communication efficiency and effectiveness, and thus are more conducive to promoting supervisor-subordinate task-based relationships. Conversely, diverse type reduces communication quality, concise type has even lower communication quality, and traditional type has high communication quality but simultaneously increases communication costs. When task communication difficulty is low, diverse type can balance communication quality and cost, thus achieving the highest task-based relationship construction. In the process of constructing supervisor-subordinate task-based relationships, diverse communication has higher information transmission speed and parallelism, can rapidly deliver massive information materials to multiple targets without geographic and time constraints, and greatly improves office flexibility and task processing efficiency (Petani & Mengis, 2021). Additionally, although diverse communication reduces emotional exchange frequency, it enables both parties to allocate more attention to work and task requirement-related communication, significantly improving communication efficiency and work performance (Shockley et al., 2021). Therefore, in diverse communication, subordinates can better perceive leaders' effective fulfillment of position responsibilities, form positive identity evaluations, and consequently develop higher task relationship identification than in traditional communication. Although concise communication focuses on task information, single text-based information transmission has lower efficiency, easily causing information miscommunication and untimely information interaction, delaying task processing progress (Brodsky, 2021). Additionally, hybrid communication with parallel online and offline communication has both some task-focused characteristics of diverse communication and retains some emotional interaction of traditional communication, thus its task relationship identification is lower than more efficient diverse communication but higher than traditional communication.

**Hypothesis 3-3:** Virtual communication patterns and task complexity have interactive effects on task relationship identification and supervisor-subordinate power relationship continuation and regeneration. Specifically, when task complexity is high, hybrid communication patterns have the highest task relationship identification, followed by traditional and diverse types, with concise type lowest; when task complexity is low, diverse communication patterns have the highest task relationship identification, followed by concise and hybrid types, with traditional type lowest.

## 4 Theoretical Construction and Innovation

Based on identity self-construction and mutual construction perspectives, this study systematically examines how static technical cues, information interaction behaviors, and virtual communication patterns affect supervisor power perception, subordinate compliance, and power relationship continuation, revealing the impact of virtual communication on supervisor-subordinate power configuration from individual (Study 1), episode (Study 2), and interpersonal (Study 3) levels. This research promotes the integration of ICT, leadership, and communication research fields and provides new practical guidance for organizational virtual communication practices and virtual team management (as shown in Figure 5 [Figure 5: see original paper]).

First, this study examines supervisor-subordinate interaction processes from a micro perspective, revealing the essential logic through which power and leadership produce effects. In existing power and leadership research, scholars mostly explore how leadership traits, behaviors, and styles affect subordinate psychology and behavior. This research paradigm implicitly assumes basic consistency between what leaders express and what subordinates receive. However, due to inherent role differences and information attenuation in communication processes, leadership behavioral expression and subordinates' received leadership signals may deviate or even conflict (Wang et al., 2021). For example, when humble leaders demonstrate humility through language, subordinates may misinterpret the meaning conveyed by supervisors (Chen et al., 2022). Since ICT filters supervisors' emotional and social cues during language expression, this situation becomes more pronounced in virtual communication (Brodsky, 2021). For instance, when supervisors send subordinates text messages saying "I want to learn from you," subordinates find it difficult to accurately infer whether supervisors are expressing social etiquette or demonstrating humility.

Yukl (2008) points out that interaction is the most direct way for leaders to influence subordinates. In virtual work contexts, supervisor-subordinate interaction is limited to text, voice, and image transmission. This raises the question of whether power and leadership can still produce expected effects through virtual interaction. This study focuses on the most direct mechanism through which leadership produces effects in virtual work contexts, examining from the event-episode level whether and how static cues and dynamic information behaviors in virtual communication affect existing hierarchical power configurations, revealing patterns, processes, and effects of supervisor-subordinate virtual interaction, verifying the effectiveness of power and leadership in virtual work contexts, and laying theoretical foundations for leadership to produce expected effects in contexts such as remote management, virtual teams, and electronic monitoring (Abbink et al., 2022).

Second, by revealing the effects of supervisor-subordinate virtual communication through communication processes, this study expands the Communicative Constitution of Organization (CCO) perspective and promotes interdisciplinary

integration between organizational behavior and communication. The CCO perspective views communication as the primary force creating, producing, and maintaining organizations and organizational practices (Brummans et al., 2014). This perspective holds that communication is not only information transmission but also a process of meaning generation and negotiation, i.e., language not only serves representational purposes but also creates, constitutes, and shapes social reality (Schoeneborn et al., 2016). This perspective focuses on both the essence of communication within organizations—explaining and predicting organizational activities by examining information exchange and communication among organizational members, internal institutions, and between organizations and social environments—and more broadly investigates how group communication becomes more organizational. Supervisor-subordinate work and interpersonal communication constitute important forms of organizational communication. However, from the current research status of supervisor-subordinate relationships, few scholars have systematically revealed the essence of supervisor-subordinate communication (Dai et al., 2022). This study follows the basic ideas and research paradigms of the CCO perspective, combining specific communication contexts of supervisor-subordinate communication to explore whether and how different communication methods and media affect both parties' identity identification and subsequent behaviors. By introducing communication theories and methods into the organizational behavior field, this study provides interdisciplinary ideas and perspectives for subsequent research on leadership, organizational communication, and other organizational activities.

Third, by treating static and dynamic characteristics of information technology as research content rather than context, this study examines how ICT affects supervisor power perception and subordinate compliance, promoting interdisciplinary integration between organizational behavior and information systems. In the wave of organizational digital intelligence transformation, research has begun to focus on how digital intelligence affects supervisor-subordinate work and interaction patterns. However, current research mostly remains at the first stage: contextual digital intelligence leadership research, focusing on examining the applicability of traditional leadership theories in digital intelligence contexts. To further promote digital intelligence leadership development, many scholars call for future second-stage research: content-based digital intelligence leadership research that treats digital intelligence technology as research content to explore leadership theory innovation (Xie et al., 2021; Zhang et al., 2021). Recent research on e-leadership and algorithmic leadership (Kellogg et al., 2020) belongs to this category. This study aims to explore how ICT changes supervisor-subordinate communication patterns and effects, treating ICT as actual content within organizations for research, deeply integrating information systems and organizational behavior fields to generate more interdisciplinary theoretical contributions.

Fourth, this study responds to the debate between technological determinism (i.e., ICT weakens leadership power) and social shaping (i.e., leaders use technology to maintain power) from an identity construction perspective, exploring the

underlying logic of human-computer interaction. The technological determinism perspective views technology as an external cause that affects and changes society (Smith & Marx, 1994). Based on this perspective, scholars argue that ICT will erase social status, power, hierarchy, and other cues between interacting parties, thereby weakening power gaps (Baym, 2015). For example, Walther's (1992) research found that team members become more equal when interacting through ICT. Conversely, the social shaping perspective argues that technology's effects come from a mixed "affordances," i.e., the performance structures provided by technology and how people use these structures ultimately determine its effects (MacKenzie & Wajcman, 1999). Technological determinism and social shaping are two mainstream perspectives for explaining human-computer interaction effects, but their validity remains contested. This study follows the social shaping perspective, arguing that in human-computer interaction, technology does not determine human behavior; rather, people use technology to achieve original purposes. By revealing how the interaction between organizational members and ICT in virtual communication affects mutual identity construction and ultimately power configuration, this study provides new ideas for future human-computer interaction research.

Practically, this study provides systematic guidance for organizational internal communication software design, organizational members' rational and efficient ICT use, and managers' remote communication effectiveness, offering important implications for organizational virtual communication practices. First, by revealing how information systems affect supervisor-subordinate power configuration, this study provides theoretical framework guidance for organizational internal communication software design (especially nested hierarchical communication modules). Through reviewing existing organizational internal virtual communication and remote collaboration software, although various communication software functions are differentiated, most designs neglect hierarchical differences between interacting parties. Currently, existing communication software has begun to design hierarchy-related modules, such as DingTalk work teams, Feishu teams, and Dalian Fanwei's superior-subordinate e-office collaborative OA systems, but still lack mechanism designs for power cues and power interactions. This study's findings will provide theoretical and practical guidance for hierarchy-based communication module or software design, thereby improving supervisor-subordinate virtual communication and remote collaboration efficiency in organizations. Second, by revealing the unique effects triggered by supervisors and subordinates using ICT for virtual communication, this study provides operational guidelines and practical norms for organizational members' rational and efficient ICT use. Although ICT is widely used in internal and external communication across organizations, few organizations have introduced normative institutional documents for ICT use. Managers and employees mostly use ICT devices according to their own styles and preferences, which easily leads to inefficiency and conflicts in remote communication. This study specifically explores whether and how different static cues, dynamic information behaviors, and patterns affect interacting parties' achievement of consistent power

relationship understanding when supervisors and subordinates use ICT for virtual communication. This will help managers scientifically and rationally use communication media to achieve expected communication purposes. Simultaneously, this study's findings will assist managers in establishing organizational internal virtual communication systems and norms, improving organizational internal communication and collaboration efficiency, and helping organizations better conduct digital intelligence construction.

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Mao Jianghua: Proposed research ideas, designed research plan, drafted and revised the paper

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