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HUMAN CAPITAL RESOURCES EMERGENCE THEORY: THE ROLE OF SOCIAL CAPITAL

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The value of human capital resources (HCR) is widely recognized, but relatively little is known about their creation. Research conceptualizes HCR emergence as enabled through shared states that form in response to environmental conditions. Although this view implies that social interactions play a role in creating HCR, theory currently fails to clarify how social interactions act as key facilitators of the emergence process. This limitation persists partly because the structure and content of the social interactions are unaccounted for, making it impossible to fully understand and predict when HCR will be generated through the HCR emergence process. To address this deficiency, we draw from social capital literature to develop HCR emergence theory. This theory brings needed precision to theoretical perspectives on HCR emergence by proposing how unique features of social interactions influence the creation of HCR through the emergence process.

Human capital resources (HCR) provide unique organizational value, affecting outcomes such as unit performance, productivity, and growth (e.g., Call, Nyberg, Ployhart, & Weekley, 2015; Oh, Kim, & Van Iddekinge, 2015; Ray, Essman, Nyberg, Ployhart, & Hale, 2023). Defined as "individual- or unit-level capacities based on individual KSAOs [knowledge, skills, abilities, and other characteristics] that are accessible for unit-relevant purposes" (Ployhart, Nyberg, Reilly, & Maltarich, 2014: 374), collective HCR is distinct from its underlying individual human capital (Ployhart & Moliterno, 2011; Ployhart et al., 2014) because it contains synergies generated through processes that combine human capital across levels (Moliterno & Nyberg, 2019). Hence, HCR is also distinct from related constructs (e.g., organizational capabilities, knowledge-based resources) because it is dependent on the human capital from which it emerges (Coff, 1997), rather than being a property of the organization itself (Ray et al., 2023). However, despite evidence that HCR uniquely contributes to unit outcomes (Nyberg, Moliterno, Hale, & Lepak, 2014), and that value-creating synergies can exist when individual-level human capital is combined across levels (e.g., Eckardt, Crocker, & Tsai, 2021), theory has yet to explain the mechanisms driving the synergies that make HCR distinct from the underlying human capital. Thus, while it is widely agreed that HCR emerges from human capital and meaningfully influences unit outcomes, research has not yet explained how, why, or when HCR forms through the emergence process.

Understanding how, why, and when HCR forms from human capital requires a multilevel approach involving emergence (Ployhart & Moliterno, 2011). HCR emergence is a process that can create value from synergies generated through human capital's social interactions because emergence is "the result of bottom-up processes whereby phenomenon and constructs that originate at a lower level of analysis, through social interaction and exchange, combine, coalesce, and manifest at a higher collective level of analysis" (Kozlowski, 2012: 267). While emergence is often used as an explanation for multilevel creation, the HCR emergence process has not been explained, meaning that, despite wide acceptance that emergence is the critical process transforming human capital into HCR, and calls to better integrate dynamic properties of such processes in HCR research (Kryscynski & Morris, 2020), we know little about HCR emergence processes (Nyberg, Ployhart, & Moliterno, 2019).

This lack of specificity regarding HCR emergence reflects the abstraction generally used to describe the concept of emergence (Eckardt & Jiang, 2019), making it challenging to understand multilevel processes of value creation more broadly (Lepak, Smith, & Taylor, 2007). Although HCR literature recognizes human capital as the origin of HCR (Ployhart & Moliterno,

2011), attention to understanding the attendant social interactions that facilitate the HCR emergence process, and the associated mechanisms, is needed to describe the links across different levels of analysis (House, Rousseau, & Thomas-Hunt, 1995). Thus, our knowledge about value creation across levels, including through HCR emergence, is poorly understood because most research glosses over the emergence process and offers little multilevel theory about the process of multilevel value creation (Kozlowski, 2019; Lang, Bliese, & Runge, 2021).

Lack of precision leads researchers to make assumptions about how social interactions change lower-level constructs during the emergence processes, leading to overgeneralized claims that the emergence process "alters", "transforms", "amplifies", or "changes" individual-level attributes. Each of these claims implies a crucial change to individual-level attributes but fails to explain how change occurs. Put simply, "in all, the notion of 'emergence' remains vague and thus opportunities remain for both micro and macro disciplines to carefully specify the underlying actors, social mechanisms, forms of aggregation, and interaction that lead to emergent outcomes" (Felin, Foss, & Ployhart, 2015: 606). Consequently, without explaining how social interactions drive emergence, we cannot predict how, why, or when HCR is created.

Drawing on research in areas such as multilevel theory and social capital, we develop *HCR emergence theory* to explain how social mechanisms facilitate HCR emergence. While human capital emphasizes value originating in individuals (i.e., KSAOs), social capital is value contained in the structural aspects of networks and the relational and cognitive content of network relationships (Adler & Kwon, 2002; Leana & van Buren, 1999; Nahapiet & Ghoshal, 1998). Social capital research views social interactions as multidimensional: this view can enrich HCR literature, which has not yet incorporated the distinctions between structural, relational, and cognitive forms of social capital. Without distinguishing between these dimensions, current literature on HCR cannot explain the foundation of emergence, because current views are too simplistic to account for the complex, multifaceted relationships that distinctly influence how human capital combines across levels. By exploring how dimensions of social interactions independently and jointly influence the HCR emergence process, HCR emergence theory establishes a deeper and more complete understanding of how HCR is created.

In introducing HCR emergence theory, we make three primary contributions. First, by examining the three distinct dimensions of social capital (i.e., structural, relational, and cognitive) in the HCR emergence process, we develop theory for how, why, and when social interactions facilitate HCR emergence. Attending to social interaction dimensions and their distinct mechanisms illuminates the social origins of HCR emergence and lays a foundation for future research about the HCR emergence process. Second, we detail how dimensions of social interactions jointly influence HCR emergence. Integrating effects of multiple dimensions of social capital further specifies the emergence process and illuminates opportunities to better understand and test HCR emergence. Third, we outline how inputs to the HCR emergence process (human capital) can influence the effectiveness of social interactions and how outputs of the HCR emergence process affect future human capital and future HCR emergence processes over time. Temporal precision in our understanding of the nature of social interactions and their influence on the HCR emergence process helps explain how, why, and when HCR is created.

THEORETICAL BACKGROUND

Human Capital Resources

HCR emanates from human capital (Becker, 1964), but, like many collective constructs, has a different meaning and function to its individual-level analog (Chan, 1998; Kozlowski & Klein, 2000; Moliterno & Nyberg, 2019). Specifically, HCR starts with unit member human capital, but arises from other sources as well (e.g., through emergence processes). Therefore, HCR is distinct in content and function from aggregate human capital (Chadwick, 2017; Ployhart, Van Iddekinge, & MacKenzie, 2011), and is conceptualized broadly as originating from all of the members' relevant KSAOs (e.g., Georgiadis & Pitelis, 2012). HCR can also be distinguished from other constructs, such as organizational capabilities. HCR and organizational capabilities are similar in that they both can affect collective outcomes (e.g., Linden & Teece, 2014; Raineri, 2017), they draw upon similar theoretical perspectives (e.g., resource-based view), and they share an interest in explaining how value (e.g., knowledge) can be created and used (Barreto, 2010). However, a key difference between them is that organizational capabilities are based on characteristics of the firm as a whole, whereas HCR is separable from the firm and based on the KSAOs of the individuals.

Precise measurement of the HCR construct is in its infancy (Eckardt & Jiang, 2019; Fulmer & Ployhart, 2014); therefore, researchers often infer HCR by measuring proxies such as collective experience, tenure,

or education (e.g., Jin, Hopkins, & Wittmer, 2010; Smith, Collins, & Clark, 2005); mean levels of KSAOs (Crocker & Eckardt, 2014; Oh et al., 2015); the number of unit members (e.g., Reilly, Nyberg, Maltarich, & Weller, 2014); or the similarity or complementarity of an individual's knowledge within the unit (e.g., Raffiee & Byun, 2020). Definitions and measurement of HCR reflect a layer of abstraction that is partially caused by the inability to fully explain the process of HCR creation—namely, the HCR emergence process. In multilevel theorization, including HCR emergence, it is crucial to understand the social interactions that are captured in collective constructs (Morgeson & Hofmann, 1999). Thus, without an explicit consideration of these social interactions, which facilitate the underlying processes that alter the value contained in HCR, it is unclear how much synergy can be generated through emergence; as a result, we are limited in our ability to fully understand the value contained in HCR (Cannella & Sy, 2019; Kozlowski, 2019; Park, Mathieu, & Grosser, 2020).

Emergence

Emergence is predicated on the idea that a whole can be more than the sum of its parts (Ablowitz, 1939) and is essential to understanding multilevel constructs (Bliese, 2000; Chan, 2019; Eckardt & Jiang, 2019; Rousseau, 1985) because differences in the meaning and function of lower- and higher-level constructs make generalizing across levels inappropriate. For instance, knowledge-management research has demonstrated that, while collective knowledge often originates from individual's knowledge (de Graaf, 1957), collective-level knowledge encompasses additional features that do not exist at individual levels, including social structures, shared attributions, team trust, and shared mental models (Fulmer & Ostroff, 2016). Although emergence can result in higher-level constructs that are less valuable than the aggregation of lower-level inputs (Brymer & Hitt, 2019), most research focuses on positive synergies (e.g., Adegbesan, 2009). Despite empirical advancements demonstrating the effects of emergence (Eckardt et al., 2021; Lang, Bliese, & de Voogt, 2018), we lack a theoretical framework to identify how it operates (Bliese, Adler, & Flynn, 2017), as in the case of HCR emergence (Cannella & Sy, 2019; Fulmer & Ostroff, 2016; Kozlowski, 2019).

Emergence-Enabling States

Currently, literature relies on explaining HCR emergence through connections between "task environments" (the extent that tasks require coordination between unit members) and "emergence-enabling states" (the collective states mobilized in response to environmental demands). This research stipulates that, when unit task environments are complex and interrelated, higher levels of affective, behavioral, and cognitive emergence-enabling states must develop for HCR to emerge (Ployhart & Moliterno, 2011). These states, which broadly refer to how individuals in a unit think, act, and feel (Marks, Mathieu, & Zaccaro, 2001), are presumed to transform human capital into collective-level HCR. However, emergence-enabling states do not necessarily refer to the process of emergence. Instead, they refer more broadly to the collective-level affect, behavior, or cognition that may lead to or result from emergence processes. Thus, to understand the *process* of emergence, instead of the broader context in which emergence processes operate, we focus on social interactions and their associated mechanisms in order to understand what drives the process of HCR emergence.

Social Processes in HCR Emergence

Social interactions are a critical definitional hallmark of emergence processes (Kozlowski & Klein, 2000; Rousseau, 1985); in other words, social interactions are necessarily integral to the HCR emergence process. However, social interactions have been largely ignored by much of the HCR emergence literature that jumps to the end state rather than investigating the processes. Key terms and definitions are in Table 1.

The literature on social capital is robust and well developed (Fang, Duffy, & Shaw, 2011; Mouw, 2006); therefore, we restrict our treatment to a brief overview of the relevant aspects that directly inform the HCR emergence process. The three central dimensions of social capital are *structural*, *relational*, and *cognitive* (Nahapiet & Ghoshal, 1998), each with a rich body of research (Adler & Kwon, 2002; Bourdieu, 1986; Burt, 1992; Coleman, 1990; Nahapiet & Ghoshal, 1998; Uzzi, 1996). Although conceptualizations vary, in general, the "structural" component represents a configuration of relationships between people, the "relational" component describes the content of the relationships that people have developed, and the "cognitive" component refers to the shared systems of meaning among people (Nahapiet & Ghoshal, 1998).

Distinction between emergence-enabling states and social capital. Although emergence-enabling states and social capital are similarly concerned with the interpersonal relational space in units (Nahapiet & Ghoshal, 1998; Ployhart & Moliterno, 2011),

TABLE 1
HCR, Emergence, and Social Capital Terms

Term	Definition	Source
HCR	Individual- or unit-level capacities based on individual KSAOs that are accessible for unit-relevant purposes	Ployhart et al. (2014)
Emergence	The result of bottom-up processes whereby phenomena and constructs that originate at a lower level of analysis, through social interaction and exchange, combine, coalesce, and manifest at a higher collective level of analysis	Kozlowski (2012): 267
Emergence-enabling states	How the unit members think, act, and feel	Marks et al. (2001); Ployhart and Moliterno (2011)
Social capital	The value contained in both the structural aspects of a social network and the content of the network relationships	Adler and Kwon (2002); Leana and van Buren (1999); Nahapiet and Ghoshal (1998)
Structural social capital	The configuration of relationships that determine the overall patterns of connections between individuals	Nahapiet and Ghoshal (1998)
Social capital density	The number of relationships in a unit relative to the number of possible relationships	Scott (2000)
Relational social capital	The value created and leveraged through relationships or bonds	Nahapiet and Ghoshal (1998)
Cognitive social capital	The shared representations, interpretations, and systems of meaning among unit members	Nahapiet and Ghoshal (1998)
Task environments	The extent to which a task requires coordination	Ployhart and Moliterno (2011)

Note: HCR = human capital resources; KSAO = knowledge, skills, abilities, and other characteristics.

"emergent states are not processes in and of themselves because they do not describe the nature of member interaction" (Marks et al., 2001: 358). Instead, they paint a broad picture of the context and outcomes of social interactions, rendering them too imprecise to explain the HCR emergence process. In contrast, social capital research, which specifies how social interactions can be used to facilitate action and provide unit value (e.g., Adler & Kwon, 2002), compliments the role of emergence-enabling states to explain the emergence process.

First, social capital recognizes social interactions as multidimensional. Nahapiet and Ghoshal (1998) identified three key dimensions of social interactions: structural properties (e.g., Burt, 1997), relational content (e.g., Putnam, 1995), and cognitive content (e.g., Grant, 1996). While social capital literature recognizes the distinction between these dimensions, emergence-enabling states overlook these dimensions in favor of a more abstract view of the social component of HCR emergence that is simpler but fails to account for these distinct properties. Second, while emergence-enabling states focus solely on the quantity of social interactions, social capital literature recognizes both the quantity and quality of social interactions. Frequent interactions do not guarantee high levels of social capital if those interactions are marked by distrust and conflict (Adler & Kwon, 2002); yet, conceptualizations of emergence-enabling states assume that more social interactions will always increase the shared states that develop. Third, social capital literature focuses directly on social interactions instead of assuming their role as a result of tasks. Social interactions can exist independently of task environments (Cummings, 1978), meaning that HCR emergence requires a disparate theory.

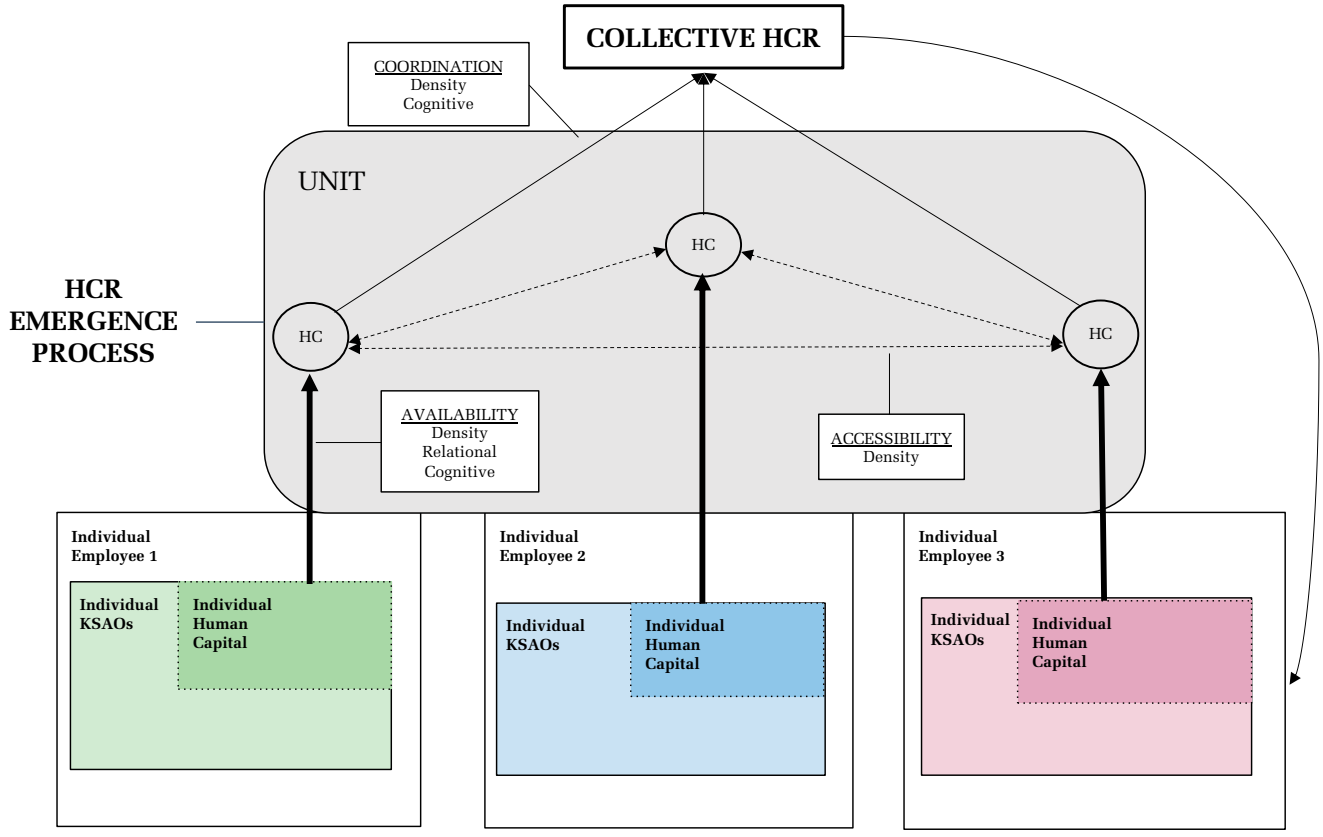
HCR EMERGENCE THEORY

Our aim is to explain precisely how the structure and content of social interactions shape a unit's level of HCR through the emergence process. To that end, we list assumptions of our theory, catalog central mechanisms through which social processes shape the HCR emergence processes, and then draw on social capital theory to build theory and generate propositions. Figure 1 depicts a model of the propositions encompassed in HCR emergence theory.

Central Assumptions

We build HCR emergence theory using three simplifying assumptions. First, we hold task environments constant. Task environments can increase or

FIGURE 1
Overview of HCR Emergence Theory



Notes: The boxes labeled Individual Employee 1–3 represent three potential employees within a unit. The box labeled Individual KSAOs represents the entire collection of KSAOs an individual possesses. The smaller dotted box represents the individual's human capital, or the subset of the collection of KSAOs that are relevant for unit purposes. The arrows within the figure represent the three mechanisms outlined in HCR emergence theory: *availability*, *accessibility*, and *coordination*. The black bolded lines connecting individual's human capital to the circles of human capital within the unit (labeled as "HC") represent the availability of human capital to the unit. The dotted lines connecting the human capital within the unit represent the accessibility of human capital to the unit. The solid gray arrows that come together at the top of the figure represent the coordination of human capital within the unit. In addition to these mechanisms, the type of social capital (social capital density, relational social capital, cognitive social capital) through which the mechanism facilitates HCR emergence is listed along with the relevant mechanism(s).

decrease the likelihood of HCR emergence (Ployhart & Moliterno, 2011) and shape the situational importance of HCR (Wolfson & Mathieu, 2021). However, task characteristics are antecedents to the social interactions that encompass emergence rather than part of the emergence process. Although task environments influence emergence, we reduce the complexity associated with considering different tasks. Second, we focus on HCR emergence in constant-sized units, defined as collections of employees assembled for a common purpose (Ployhart et al., 2011). Although HCR can emerge at the firm level (e.g., Liu, 2014), we assume a single social unit—small enough that all unit members can interact—as a simplifying condition for thinking about the HCR emergence process. Third, social capital can exist within a unit (internal social capital) or extend to others outside the unit (external social capital), and external social capital can provide knowledge and resources through relationships to outside parties (e.g., Galunic, Ertug, & Gargiulo, 2012; Koka & Prescott, 2002; Lingo & O'Mahony, 2010). We focus on internal social interactions to explain influential mechanisms enabling HCR emergence.

Additionally, while HCR emergence theory explains how HCR is formed, it is not sufficient to explain unit performance. Unit performance depends on factors such as alignment between HCR and other performance drivers. For instance, high HCR could be used to follow an ill-conceived strategy, and thereby ultimately hinder performance.

Emergence Mechanisms

Social interactions are a central feature of all emergence processes. However, precisely how social interactions affect the HCR emergence process has heretofore not been addressed. We draw on three HCR emergence mechanisms through which social interactions change relevant human capital into HCR: (1) availability, (2) accessibility, and (3) coordination. We propose that these three mechanisms explain how social interactions drive HCR emergence; they alter how social interactions determine how much human capital is provided, who it is provided to, and when the provided human capital can be channeled toward shared purposes.

Availability. HCR depends on the *availability* of human capital for unit purposes (Ployhart et al., 2014). Every individual has multiple KSAOs that form individual human capital, but its usefulness to the unit hinges on whether it is shared (Zhao & Chadwick, 2014). Employees have discretion over whether to share KSAOs with others. For instance, employees can choose whether to engage in helping behaviors outside of their contracted duties (Kim & Mauborgne, 1996; Organ, 1988). They can also benefit themselves by withholding beneficial information (Evans, Hendron, & Oldroyd, 2015; Haas & Park, 2010) or use social contacts for private benefit instead of for unit purposes (Adler & Kwon, 2002). Thus, we use availability to indicate the quantity and quality of human capital that employees share with the unit.

Accessibility. "Accessibility" refers to how widespread and easily human capital can be reached and used. Using knowledge as an example, accessibility could refer to the general capacity to share knowledge throughout the unit. Only human capital that is accessible can be integrated into a collective HCR (Ployhart et al., 2014), and higher amounts of HCR will emerge when social interactions make the unit's human capital more accessible. For instance, an employee may have expert knowledge about distinct aspects of a unit process, but access of other members to that knowledge would help the unit work more efficiently because indirect communication through third parties takes more time and resources and information can be lost in the process (Coleman, 1988, 1990; Hansen, 1999).

Coordination. "Coordination" refers to a harmonious combination of human capital inputs that enable employees to function effectively (Rico, Sanchez-Manzanares, Gil, & Gibson, 2008). The availability and accessibility of human capital do not guarantee that it will be put to its best use; coordination helps organize human capital to make it effective. For instance, while unit members may make their human capital available to all other unit members, if employees are uncertain or disagree on how that human capital should be used, they may be unable to coordinate it effectively toward a collective purpose.

Together, these mechanisms—availability, accessibility, and coordination—help explain how human capital can be changed in the emergence process to affect the amount of HCR that results. Next, we theorize about connections between dimensions of social capital (structural, relational, cognitive) and the amount of HCR that results through changes to the availability, accessibility, or coordination of human capital in the unit.

Structural Social Capital

"Structural social capital" is the configuration of relationships determining the overall patterns of connections between individuals (Nahapiet & Ghoshal, 1998). Structural social capital is often conceptualized as "social capital density," measured as the number of relationships in a unit relative to the number of possible relationships (Scott, 2000; Shaw, Duffy, Johnson, & Lockhart, 2005). Thus, density is lowest when no relationships exist and highest when all members have direct relationships with all others (Haray, 1969; Reagans & Zuckerman, 2001).

Social capital density and accessibility. Social capital density primarily facilitates HCR emergence through accessibility in two distinct ways. First, social capital density increases accessibility by allowing quicker and easier information sharing. Dense units spread information quickly through multiple paths (Bakshy, Rosenn, Marlow, & Adamic, 2012; Lerman & Ghosh, 2010). For instance, if one person is a single point of contact (this cannot occur in dense units), their absence will adversely affect information flow (Baker, 1984; Baker & Iyer, 1992; Hansen, 1999). However, in dense units, overlapping relationships allow for multiple paths, which make it easier for unit members to gain access to others' human capital (Anderson & Jack, 2002; Vancouver & Morrison, 1995) and share knowledge with others in the unit (Adler & Kwon, 2002; Borgatti, Jones, & Everett, 1998; Kang, Kim, & Chang, 2008).

Second, social capital density enhances accessibility by increasing the number of individuals connected to one another. In units with lower density, some individuals may be disconnected to others (Burt, 1998), which may be detrimental when valuable human capital (e.g., stars) is inaccessible

(Rossman, Esparza, & Bonacich, 2010). Alternatively, in dense units, a higher proportion of unit members and their human capital are accessible to others because redundant social interactions, characteristic of high-density units, facilitate the formation and maintenance of relationships (Coleman, 1988), and the high visibility makes it less likely that unit members will be excluded (Misztal, 1996). More frequent communication between unit members also promotes inclusion, ensuring that more individuals are integrated (Janssens & Zanoni, 2007). Therefore, social capital density makes more human capital accessible because a greater proportion of individuals' human capital is connected.

The role of social capital density in increasing the accessibility of human capital could be demonstrated in the context of a law firm. When all lawyers, paralegals, and support staff are connected (high density), the ability to access every member of the unit can be advantageous for gaining quick access to shared knowledge (e.g., in the case of multiple staff members who maintain a master schedule of all lawyers' appointments) or make it easier to access unique sources of knowledge that may only be contained in one individual (e.g., a lawyer with specialized knowledge of one case). The inability to overlook unit members because of redundant connections (e.g., when every lawyer is connected to every paralegal) also ensures that the maximum number of individuals will be connected, making it more likely that human capital within the unit will be accessible to others in the unit.

Social capital density and availability. Social capital density can also increase human capital availability. Dense social capital promotes the enforcement of desired norms, including encouraging individuals to make their knowledge or skills available to the unit. In higher-density units, shared ideas about desirable behaviors are clearer and easier to enforce because behaviors are more frequently observed, discussed, and corrected by unit members, and deviance from norms is harder to hide and more likely to be punished (Granovetter, 2005). For instance, denser units have more ability to punish and reward individual's contributions to an online knowledge database, resulting in better-quality information shared by individual contributors (Piskorski & Gorbatâi, 2017). These features of shared norms increase human capital availability by establishing expectations for sharing human capital, rewarding those who share their human capital, and punishing those who do not (Chatman, Caldwell, O'Reilly, & Doerr, 2014; De Long & Fahey, 2000), all of which increases the sharing of human capital with others (Widén-Wulff & Ginman, 2004), and hence enhances the HCR emergence process. In our law firm example, lawyers and staff will be motivated to share their knowledge or skill if high social capital density creates a norm of knowledge sharing.

Social capital density and coordination. Finally, social capital density can improve human capital coordination through greater proximity between unit members, fostering easier formal and informal communication. When efficient communication develops, individuals can better synchronize their behaviors for unit purposes. Coordination allows units to manage interdependence and channel individual expertise (Faraj & Sproull, 2000; Malone & Crowston, 1994). For instance, Weick and Roberts (1993) found that aircraft carrier teams with higher cooperation built through persistent purposeful interactions with others in close proximity accomplished tasks that were beyond the capabilities of the individual team member. Denser units can coordinate human capital better than less dense units because it is easier to communicate and adjust to others in the unit. Returning to the law firm example, close and frequent contact, associated with social capital density, can promote informal communication about the progress of various cases. Knowing the status of more cases can help lawyers time their work to maximize efficient use of staff and resources

Proposition 1. Social capital density is positively related to HCR generated through the HCR emergence process.

Relational Social Capital

"Relational social capital," the value of the particular content contained in relationships (Nahapiet & Ghoshal, 1998), can also influence HCR emergence. Relational social capital includes a range of affective and attitudinal characteristics embedded in social relationships. Characteristics such as trust, obligation, respect, friendship, and identity are collectively referred to as "goodwill," from which information, influence, and solidarity flow (Adler & Kwon, 2002; Granovetter, 1992; Leana & van Buren, 1999; Nahapiet & Ghoshal, 1998). Unlike social capital density, we posit that the effect of relational social capital can be either positive or negative.

Positive effect of relational social capital. Relational social capital facilitates HCR emergence through availability in two ways. First, relational social capital increases availability by making individuals more willing to share with one another.

At lower levels of relational social capital, unit members may be more reluctant to share information based on lower levels of trust, liking, or reciprocity aspects of goodwill. For example, Rutten, Blaas-Franken, and Martin (2016) found that coworkers with low trust were less willing to engage in implicit or explicit knowledge sharing. However, when relational social capital is higher, higher goodwill increases the amount and quality of relevant information that unit members are willing to exchange (Ellis & Shockley-Zalabak, 2001; Usoro, Sharratt, Tsui, & Shekhar, 2007). Increases in goodwill among coworkers also result in increased transfer of the unit's tacit knowledge and skills (Holste & Fields, 2010), which form a crucial subset of human capital encompassing context-specific know-how that is difficult to convey (Ambrosini & Bowman, 2001; Polanyi, 1966). Members of units with higher trust are also more willing to disclose personal or sensitive information (Cazier, Shao, & Louis, 2007) and are less likely to hoard information (Lee & Choi, 2003).

Second, relational social capital promotes availability by increasing feelings of closeness between unit members. As relational social capital increases, more members are considered part of the in-group (Brewer & Gardner, 1996) and members who are part of the in-group are more willing to make their human capital available to one another (Ashmore, Deaux, & McLaughlin-Volpe, 2004). For instance, affective trust often increases one's willingness to help others (Swift & Hwang, 2013). Feelings of closeness can also buffer potential conflict and increase unit members' willingness to help coworkers when needed (Rispens, Greer, Jehn, & Thatcher, 2011), promoting higher human capital availability. Indeed, workers with goodwill toward one another work longer hours (Ng & Feldman, 2008), voice more novel ideas (Hirst, van Dick, & van Knippenberg, 2009; Madjar, Greenberg, & Chen, 2011), and spend more time helping others (Blader & Tyler, 2009). Overall, feelings of closeness that develop in units increase the availability of human capital to the unit.

The benefits of relational social capital for increasing human capital availability could be observed within a government office. These employees might develop goodwill through social interactions and repeated opportunities to interact both formally (e.g., on assigned projects) and informally (e.g., during lunch breaks). Trust and positive feelings between these employees will make them willing to share more (e.g., give more attention to helping a colleague with a presentation) and better-quality human capital (e.g., voice novel or creative ideas in meetings), resulting in a higher quantity and quality of human capital contributions available to the unit.

Negative effect of relational social capital. Although greater relational social capital generally leads to higher amounts of HCR emergence, extremely high relational social capital can reduce the amount of HCR in three ways. First, extremely high relational social capital can inhibit the voicing of dissenting opinions, thus reducing the availability of relevant human capital. For example, where unit members exhibit high levels of trust in leaders, individuals may be less likely to speak up, even when there is potential for improvement (Gao, Janssen, & Shi, 2011). The negative effects of high relational social capital and unwillingness to share contradictory knowledge or opinions occur even between unit members at the same job level (Pillemer & Rothbard, 2018). Thus, individuals in units with very high relational social capital may not share valuable human capital if it conflicts with the ideas of others with whom they share high levels of goodwill, thus decreasing the amount of HCR through a reduction in human capital availability.

Second, high levels of relational social capital can reduce accessibility if some workers see their views as unwelcome. As relational social capital increases, a stronger in-group–out-group distinction becomes ingrained, potentially leading to increased out-group hostility (Putnam, 2000; Svendsen & Svendsen, 2004). Units with very high relational social capital may be less willing to welcome outsiders, particularly if an outsider's ideas are distinct from those of current unit members (Rink, Kane, Ellemers, & van der Vegt, 2013). Because newcomers cannot be quickly and effectively accessed by others, these exclusionary behaviors may result in a reduction in the amount of human capital that units can access to form the HCR (Reilly et al., 2014).

Third, extremely high levels of relational social capital may also reduce coordination because of friendship bonds. Friendships between unit members can be beneficial (Levesque, Steciuk, & Ledley, 2002), but can also cause individuals to spend time on unproductive purposes (Jett & George, 2003; Morrison & Nolan, 2007). Close friendships can also drive members to use human capital to the benefit of friends instead of the entire unit, creating role conflict between informal friendships and formal job roles (Pillemer & Rothbard, 2018).

The negative effects of relational social capital can be illustrated by returning to the example of a government office. If employees have overly strong bonds of trust and closeness with each other, they may be

reluctant to share new ideas about changing established policies for fear of contradicting other unit members. Very high relational capital could also limit accessibility if it results in cliques who refuse to integrate new employees into the established social order. As relational social capital reaches extreme levels, personal friendships may also become more important to employees than their job roles, meaning that some employees may choose to prioritize their friendships by taking additional breaks together or withholding information about operational problems, which may divert human capital away from serving shared unit goals.

The potential negative behaviors associated with low and very high relational social capital imply that neither extreme will maximize HCR. Instead, moderate levels of relational social capital allow units to maximize human capital by compelling individuals to share and use more of their human capital without the drawbacks associated with extreme homogeneity, which can occur at higher levels of relational social capital.[1]

Proposition 2. Relational social capital has a curvilinear relationship with HCR emergence such that low and very high levels of relational social capital generate less HCR through the emergence process than moderate levels of relational social capital.

Cognitive Social Capital

"Cognitive social capital" refers to shared representations, interpretations, and systems of meaning among unit members (Nahapiet & Ghoshal, 1998), and can be measured as shared goals, narratives, or codes (Adler & Kwon, 2002; Tsai & Ghoshal, 1998). Cognitive social capital establishes a mutual understanding, enabling units to work toward a shared purpose. Cognitive social capital is similar to organizational culture in that they both emphasize shared cognitive frameworks and artifacts such as language. However, cognitive social capital views the value in such shared systems of meaning as existing in the space between individuals (Nahapiet & Ghoshal, 1998), while organizational culture exists as a collectively shared property of the unit (Schein, 1990). These constructs exist at different levels and cognitive social capital more directly characterizes the social interactions that are the heart of emergence, whereas culture focuses on how the outcome of such interactions results in a higher-order shared property.

Cognitive social capital and coordination. Cognitive social capital primarily facilitates HCR emergence through coordination in two ways. First, high levels of cognitive social capital make communication more efficient. Shared languages and codes simplify knowledge sharing (Inkpen & Tsang, 2005). The shared goals implied by higher cognitive social capital can also improve coordination. When goals are shared broadly and uniformly throughout the unit, human capital can be more effectively channeled toward shared purposes (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004). When goals are commonly understood, there is less conflict and less time spent trying to understand the perspective of others (Cosier & Rose, 1977; Locke, Smith, Erez, Chah, & Schaffer, 1994).

Second, cognitive social capital facilitates the development of shared interpretations of tasks, priorities, and information, facilitating higher levels of coordination. Individuals are also more attracted to and more inclined to develop similar attitudes and behaviors to those they believe think similarly (Byrne, 1961). Shared cognition leads to common ways of sense-making (De Carolis & Saparito, 2006; Grant, 1996; Nonaka, 1994). For instance, when units share understandings, coordination can manifest through mechanisms such as routines and schedules that reinforce shared interpretations and common understandings (Okhuysen & Bechky, 2009). When individuals interpret situations similarly, it reaffirms their commitment to others (Mohammed, Ferzandi, & Hamilton, 2010), motivating workers to coordinate with one another.

The role of cognitive social capital in increasing the coordination of human capital could be demonstrated in the example of a new tech startup. Even if the company hires talented engineers and managers, they may be unable to fully leverage those skills until they develop shared language (e.g., acronyms) and align unit goals. As cognitive social capital develops, shared language and goals can be reinforced, causing unit members to develop more similar patterns of behaviors (e.g., routines for storyboarding) that enable more efficient coordination.

Cognitive social capital and availability. Cognitive social capital can also increase human capital availability. High levels of cognitive social capital imply shared history, language, goals, and ideas, all of which increase being understood by others (Maynes & Podsakoff, 2014). For instance, computer

[1] We predict that the shape of the curvilinear effect will be asymmetrical such that the negative effect may occur only at exceptionally high levels of relational social capital.

programmers who use unit-specific jargon (e.g., abbreviations for unit databases) will be better understood by those familiar with the jargon, increasing both the willingness and ability to share relevant human capital. Additionally, high levels of cognitive social capital can increase closeness if an exclusive system of language and codes promotes pride in those who share the language (Joseph, 2004), which could increase their willingness to share their human capital with the group.

Proposition 3. Cognitive social capital is positively related to HCR generated through the HCR emergence process.

Establishing the direct relationships between structural, relational, and cognitive dimensions of social capital and the level of HCR emergence (Propositions 1–3) explains their distinct roles in the HCR emergence process. While these three dimensions of social capital operate independently (Nahapiet & Ghoshal, 1998), they also coexist (e.g., Bolino, Turnley, & Bloodgood, 2002; Tsai & Ghoshal, 1998) and can jointly influence the level of HCR emergence.

Structural and Relational Social Capital

As described, relational social capital partially facilitates emergence by promoting feelings of closeness that increase the availability of the human capital individuals share and contribute to the HCR, until relational social capital becomes too high. Then, social interactions may become distracting or make individuals reluctant to contribute unique ideas, ultimately inhibiting HCR emergence. The curvilinear effect may be shaped by structural social capital.

Low social capital density. When social capital density is low, members are not broadly connected. Although this negatively affects HCR emergence, it can also mitigate negative effects of low relational social capital. Low relational social capital can manifest as hindering others, including withholding human capital and hoarding valuable information, which is particularly damaging when it causes others to retaliate, escalating tension and animosity (Neuman & Baron, 2005). Even perceived knowledge hoarding can be damaging to unit outcomes (Evans et al., 2015). However, when social capital density is low, it reduces the spread of these behaviors, and fewer members will engage in and be affected by such negative behaviors.

As relational social capital increases, its benefits (e.g., feelings of closeness that increase the quantity and quality of available human capital) are less accessible if social capital density is low, because units with low social capital density are less efficient at sharing relational social capital benefits (Reagans & McEvily, 2003). For instance, if a member shares knowledge with a person who is unconnected to other members, the benefits will not spread throughout the unit. Units with lower density are also less adept at socializing and integrating new members and their human capital. New employees rely on subtly monitoring and actively seeking information from others to determine whether they are meeting expectations and group norms (Ashford, 1986; Ashford, Blatt, & VandeWalle, 2003; Morrison, 2002). In low-density units, limited visibility and restricted access inhibits individuals from learning norms, asking for help, or identifying who has valuable human capital (Coleman, 1988). Hence, low-density units hinder knowing what human capital to share and who to share it with, even in conditions of increasing relational social capital. In low-density environments, even as relational social capital increases, limited accessibility to goodwill and trust remains, resulting in lower potential for synergies in the emergent HCR.

When relational social capital reaches very high levels, over-cohesiveness can lead to unit members becoming reluctant to disagree. However, low social capital density means that negative over-cohesiveness remains concentrated rather than spreading throughout the unit. For instance, groupthink is more reinforced in units with frequent interactions because ideas are spread with minimal dissent (Park, 1990). Additionally, when groupthink is driven by a single dominant voice who influences other members, low-density networks can help mitigate the negative effects by separating problematic individuals from the rest of the unit (Lechner, Frankenberger, & Floyd, 2010). In such cases, low density can mitigate over-cohesiveness and increase the likelihood that individuals will provide more human capital to the unit.

Accordingly, we expect that the curvilinear relationship between relational social capital and HCR emergence will have a less pronounced curvature when social capital density is low. An example of low social capital density might be found in a unit of software developers who mostly work independently. Even if relational social capital develops between dyads or small groups, it may not spread to other unit members. Without widespread goodwill, developers may be less willing to share creative ideas or previously unrevealed programming skills. Still, the isolation of relational capital may become beneficial if the extreme level of goodwill breeds an unwillingness to challenge others due to fear of conflict.

High social capital density. We have made arguments for how the effects of low relationship social capital will be mitigated when social capital density is low, and the logic also implies that these effects will be accentuated when density is high. For instance, if an employee is mistreated or ignored, the denser the unit, the more likely that others will notice, leading to lower unit identification and comfort (Dhanani & LaPalme, 2019), or to counterproductive behaviors such as knowledge hoarding (Yao, Zhang, Luo, & Huang, 2020), thus reducing human capital availability. Mistreatment can also become normalized behavior (Mitchell & Ambrose, 2007), and will become normalized faster in dense units (Bernhard, Fehr, & Fischbacher, 2006). Extending our software development example, poor relationships between software developers could make them more likely to withhold innovative ideas if ill will is more pervasive, salient, and visible because of very high social capital density.

Thus, low social capital density dampens the negative effects of high and low relational social capital, and high social capital density accentuates the differences between low, moderate, and high social capital. As social capital density increases, we therefore expect the curvilinear aspect of the effect of relational social capital to become more pronounced.

Proposition 4a. Social capital density moderates the curvilinear effect of relational social capital on HCR such that the relationship becomes more distinctly curvilinear as social capital density increases.

Cognitive and Relational Social Capital

Low cognitive social capital. The interaction of relational and cognitive social capital will also affect HCR emergence. As described, low cognitive social capital inhibits human capital coordination and may limit the benefits gained from the availability and accessibility of human capital offered in units with moderate levels of relational social capital. For instance, higher levels of trust motivate individuals to work on behalf of others but cannot guarantee the pursuit of unit goals—human capital may be used for individual outcomes instead (Adler & Kwon, 2002; Walter, Lechner, & Kellermanns, 2007). Misaligned goals can be problematic (Vancouver & Schmitt, 1991), and cognitive social capital promotes goal alignment and uniform interpretations of events and conditions. Alignment may be even more important when relational social capital is low or very high—that is, when human capital is less available or accessible. Under very low or very high social capital conditions, low cognitive social capital means that the poor quality or quantities of available human capital will also be used poorly, exacerbating the negative effects. For instance, if an individual is distrustful of others and thus only shares a subset of their relevant skills, the lack of a clear vision may result in disagreements regarding how their skills should be utilized by the group and increases the likelihood they will be put to suboptimal use, further reducing the effectiveness of the limited human capital they were willing to share.

High cognitive social capital. Coordination benefits of high levels of cognitive social capital can substitute for low and high levels of relational social capital. When relational social capital is low, a unit lacks bonds that facilitate availability and accessibility (Li, Ye, & Sheu, 2014). However, high cognitive social capital encourages individuals to work toward shared purposes, even at low trust levels. Hence, members serve a common vision, even if they have low trust or goodwill, meaning that the negative effects of low and high relational social capital can be attenuated when cognitive social capital is plentiful.

When relational social capital is very high, such that members are overly cohesive, they may let personal relationships interfere with achieving unit goals. Cognitive social capital, however, promotes understanding and acceptance of unit goals. For instance, unit members become socialized by watching behaviors of role models (Robinson & O'Leary-Kelly, 1998), even if those role models are deviant (Robinson, Wang, & Kiewitz, 2014). When employees share collective goals, the likelihood of using their human capital toward nonrelevant purposes decreases because personal and unit goals are aligned. This might be observed in a surgical team where employees all share the same goal (i.e., to conduct a successful surgery). Even if unit members have high levels of relational social capital, because individual and collective goals are better aligned, it is less likely that the relational social capital will distract individuals from unit objectives or cause them to use their human capital for irrelevant purposes.

High levels of cognitive social capital are common in organizational cultures that foster inclusive environments where individuals feel free to share ideas and contribute to the unit (Shore, Randel, Chung, Dean, Holcombe Ehrhart, & Singh, 2011). Thus, because high cognitive social capital helps coordinate individual human capital toward its most beneficial purpose, it decreases the negative effects of both

extremely low and extremely high levels of relational social capital.

Proposition 4b. Cognitive social capital moderates the effect of relational social capital on HCR emergence such that the relationship becomes less distinctly curvilinear when cognitive social capital is high.

Cognitive and Structural Social Capital

High social capital density can increase the positive impact of cognitive social capital on the amount of emergent HCR created, for two reasons. As cognitive social capital increases, it builds strong shared systems of meaning and culture that lead employees to agree on what needs to be done and to share a common language to accomplish their goals. Cognitive social capital becomes more effective as more people use it (Uzzi, 1996); therefore, as density increases, a wider range of unit members will be coordinated within the unit, making more human capital accessible to be put toward its best purpose for the unit. In units with lower density, shared language or ideas are slower to spread. For instance, during a unit reorganization, when managers communicate new policies or values, information will be disseminated quicker in denser units, resulting in more positive unit outcomes (Kernan & Hanges, 2002; Schweiger & Denisi, 1991). Once that information is broadly accessible, its value depends on the extent it is understood, committed to, and acted on. Without high cognitive social capital, even accessible human capital can be poorly coordinated and therefore is less likely to be put toward achieving shared purposes.

Additionally, high social capital density reinforces high levels of cognitive social capital by reducing uncertainty about what aspects of the shared culture are rewarded. When employees react to reward and punishment systems in dense units, the positive effects of high levels of shared cognitive social capital are more strongly reinforced. For instance, units with high density may be better equipped to reinforce artifacts of cognitive social capital, such as shared routines and language, that help coordinate unit members' behaviors toward shared goals because individuals more frequently encounter feedback from a higher proportion of unit members (Ashforth, Rogers, & Corley, 2011). For example, in a restaurant where routines are particularly crucial to performance outcomes, unit members in dense units are better able to observe and enforce effective patterns of behaviors (e.g., how to take orders, jargon used to communicate with cooks), which better reinforces and coordinates the cognitive social capital needed to work together effectively. Thus, social capital density makes high levels of cognitive social capital more widespread, efficient, and consistent in the unit.

Proposition 4c. Social capital density moderates the effect of cognitive social capital on HCR such that, when social capital density is high, the positive effect of cognitive social capital on HCR is stronger.

Inputs and Outputs of the HCR Emergence Process

To fully capture the dynamic aspects of HCR emergence, we next consider the heterogeneity of the human capital available as inputs to the HCR emergence process. Then, we examine the ways through which the output of the HCR emergence process—HCR—can be a contextual influence on future human capital and social interactions in the unit (see Figure 1).

Human capital as an input. Human capital is the raw material necessary for the HCR emergence process, and the human capital available to the unit can be understood in terms of its heterogeneity—that is, the extent to which a variety of KSAOs are present in the unit (Ployhart et al., 2014). Human capital heterogeneity is higher in units where individuals possess distinct, nonredundant KSAOs and lower in units where individual possesses similar types of KSAOs. Although social interactions are required for emergence to occur (Kozlowski, 2012), we expect the mechanisms required for HCR emergence to be more sensitive to levels of all three dimensions of social capital (density, relational, cognitive) when human capital is heterogeneous.

Units with heterogeneous human capital can be more sensitive to social capital density because human capital is less redundant. When members possess similar human capital, each individual contributes less unique value (Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001), making it less critical that every person can be accessed. Alternatively, when members offer unique human capital, access to that human capital is more burdensome, due to differences that may make it difficult to both effectively share and interpret others, and thus density becomes increasingly critical for members to be aware of and build commonalities required to both understand and access human capital. Therefore, HCR derived from emergence processes will be more sensitive to social capital density if the unit's human capital is heterogeneous.

Units with heterogeneous human capital will also be more sensitive to the level of relational social capital, because more trust and goodwill are required to obtain and consider information from people who have more divergent perspectives. Intragroup differences can breed conflict (Jehn, Northcraft, & Neale, 1999), which can disrupt the HCR emergence process. However, task-related conflicts can be productive when accompanied by high levels of trust and respect (Barczak, Lassk, & Mulki, 2010; Cheung, Gong, Wang, Zhou, & Shi, 2016; Peterson & Behfar, 2003; Simons & Peterson, 2000). Thus, when individuals possess heterogeneous human capital, the goodwill that accompanies higher levels of relational social capital will be crucial to facilitating the HCR emergence process. Homogeneous groups are less prone to conflict (Jehn et al., 1999) and are more likely to share goals and perspectives, even in the absence of strong goodwill, making relational social capital less pivotal to HCR emergence in homogeneous units.

Units with heterogeneous human capital will also be more sensitive to cognitive social capital because members with diverse knowledge structures require a stronger shared purpose to build common ground. For instance, two project team members may need more shared understanding, a stronger sense of purpose, and a common language to work collaboratively if one has expertise in finance and the other in marketing, compared with that needed by two finance specialists who have more similar perspectives.

Proposition 5. The effect of (a) social capital density, (b) relational social capital, and (c) cognitive social capital on HCR generated through the HCR emergence process will be stronger when units are more heterogeneous.

Human capital as an outcome of HCR. Once HCR emerges, it influences subsequent human capital and social capital. HCR, like other collective constructs, can "exert influence that is independent of the interaction that initially caused the construct to emerge" (Morgeson & Hofmann, 1999: 251). Thus, HCR will affect future human capital inputs (Schneider, 1987) and future patterns of social interactions. Higher HCR levels will produce results that reward the conditions that produced it. For instance, HCR is linked to unit performance (e.g., Call, Nyberg, Ployhart, & Weekley, 2015), and unit performance, in turn, can bring rewards to both unit-level and individual-level outcomes (Seibert, Silver, & Randolph, 2004; Whitman, Van Rooy, & Viswesvaran, 2010). These rewarding outcomes serve as reinforcements for creating specific configurations of human capital. For instance, if high emotional intelligence contributes to a sales unit's success, the members may strive to increase their own emotional intelligence.

Additionally, emergent HCR can influence subsequent HCR emergence cycles by shaping social capital development. As newcomers enter units, they are likely to be socialized based on pre-existing social systems because HCR is both a product of and a constraint on individuals' behaviors (Barley, 1986). Thus, the HCR acts as a top-down influence, encouraging individuals to match their social interactions to those that currently exist within units (Weller, Hymer, Nyberg, & Ebert, 2019). Units with higher cognitive social capital have higher levels of shared goals and perspectives, which will be more visible and send a more consistent message to newcomers about what is appropriate or expected. A clear understanding of norms allows them to more quickly adopt behaviors and cognitions that are consistent with those of peers. For example, an emotionally intelligent sales unit might also strengthen norms for sharing sales tactics if the practice leads to success. Based on this logic, HCR can influence the type of human capital and social interactions that feed into future HCR emergence processes. The specific effects will be contingent on existing configurations of individual KSAOs and specific modes of interaction, reinforcing existing patterns. Nevertheless, the logic supports the prediction of general effects.

Proposition 6. HCR affects future (a) human capital and (b) social capital that develop within the unit.

DISCUSSION

Although the importance of HCR is well established (Nyberg & Moliterno, 2019), theory about how, why, or when HCR is created remains scant. Conceptualizing the creation of HCR as an emergent process assumes that social interactions are central to their creation, but inattention to structural, relational, and cognitive dimensions of social interactions has led to a model that implicitly assumes that social interactions result from task environments and that only the amount of social interaction affects the HCR emergence process. *HCR emergence theory* challenges these views, providing richness and nuance to the understanding of the distinct social mechanisms that drive HCR emergence.

Theoretical Implications

HCR emergence theory makes three central theoretical contributions. First, it specifies the social

interaction mechanisms that drive HCR emergence. For instance, social capital density compels unit members to make human capital accessible by promoting systems for sharing information, and also influences the types of human capital shared. Without understanding these mechanisms, it is impossible to explain how social interactions affect human capital to become collective HCR. Understanding these mechanisms also helps to predict when and how HCR emergence occurs. For instance, high cognitive social capital promotes HCR emergence by providing unit members with shared representations that help coordinate individual human capital toward achieving collective outcomes. Further, because HCR emergence theory recognizes nuanced differences among social capital dimensions, it is evident that each dimension can interact to jointly influence HCR emergence. Thus, we develop theory on HCR emergence by revealing that social interactions do not have a uniform impact on HCR emergence, and provide specifications for the direct roles of structural, relational, and cognitive social capital, as well as their interactive influences, to better understand when HCR emergence will occur.

Second, HCR emergence theory elevates social interactions from a vague antecedent to a central feature of HCR emergence. Prior research explains social interactions as a contextual condition with limited influence on the HCR emergence process. This is problematic because, even in similar tasks, job roles, or industries, the amount of social capital can differ. For example, two units in a manufacturing plant with similar levels of human capital and similar tasks can still develop varying levels of social capital, because relationships between unit members form and function independently of other unit attributes. Without directly considering social interactions, current perspectives neglect a more complete and necessary consideration of social interactions as a distinct component of the HCR emergence process.

Third, HCR emergence theory incorporates feedback loops to specify how the social component of HCR emergence changes over time. As social capital develops, its influence on HCR emergence shifts, implying that the HCR emergence process may not be linear and that the social mechanisms in the unit may shift over time and adjust as HCR develops. Additionally, each dimension of social capital may influence the effectiveness of other dimensions. For instance, higher levels of cognitive social capital may increase the amount of HCR that emerges by reducing the negative effects of over-cohesiveness associated with very high levels of relational social capital. Alternatively, high levels of density may reduce the amount of HCR that emerges at high levels of relational social capital by exacerbating the negative effects of over-cohesiveness. Thus, HCR emergence theory explains how dynamic properties of social interactions change over time, providing guidance on the temporal aspects of HCR emergence.

Although our central contribution is to HCR theory, our work also contributes to growing efforts to integrate theories of human and social capital. For example, Wolfson and Mathieu (2021) demonstrated how social capital can be leveraged to deploy HCR, clarifying synergies between HCR and unit performance. Similarly, recent research has explored how the match between levels of human capital and social capital affect unit learning capability and unit performance (Sun, Li, & Liu, 2020; Weller et al., 2019). This work builds on earlier perspectives, such as Coleman's (1988) work, which showed that social structures can shape the development of individual's human capital, and research that delineates the distinct roles human and social capital plays in individual performance (Dokko, 2004). Human and social capital have also been integrated in human resource management literature, which has found certain policies or practices to be better suited for developing human or social capitals (e.g., Kang, Snell, & Swart, 2012; Trevor & Nyberg, 2008).

Despite these advances, to our knowledge, we are the first to apply social capital theory to understanding the antecedents of HCR by examining the role that social capital plays in the HCR emergence process. In doing so, we use social capital theory to better understand when and why human capital is more available, accessible, and coordinated to predict when higher levels of HCR will emerge, thus bringing clarity to the underlying social interactions that shape HCR emergence. Our theory suggests that social interactions are multidimensional and contain distinct structure and content that facilitates the change from individual human capital into HCR. Thus, unlike prior perspectives that view social capital as an external influence on human capital or HCR, we suggest that it is central and necessary to the process of creating HCR.

Limitations and Future Research

One barrier to testing our theory is that measuring HCR is complicated. The construct clarity we provide opens several specific ways researchers may choose to test our propositions. First, to test contributions of social capital density toward HCR

creation, researchers may use manager ratings of human capital contribution, sharing, or coordination based on the experience of partners (see Ouerdian, Mansour, Al-Zahrani, & Chaari, 2019, for a similar approach). Second, to test how relational social capital leads to HCR, researchers could infer the incremental increases in performance through HCR proxies, controlling for simple aggregations of human capital (see Ployhart, Weekley, & Ramsey, 2009, for a similar approach). Third, contributions of cognitive social capital to HCR creation might be assessed by expert third-party observers, who could observe or interview individual workers (see Gaugler, Rosenthal, Thornton, & Bentson, 1987, regarding the validity of expert raters). Fourth, the interaction between forms of social capital (e.g., social capital density, relational social capital) could be measured by examining a three-way interaction between social capital density, relational social capital, and mean levels of human capital (see Crocker & Eckardt, 2014, for a related interactive approach). While we believe these suggestions are an important starting point for understanding and testing HCR emergence, we recognize that properly measuring and testing HCR and the HCR emergence process continue to remain a substantive challenge. Therefore, we encourage scholars to continue working to develop more accurate and complete measures of HCR and associated processes such as HCR emergence.

HCR emergence theory illuminates five broad directions for future research. First, although we focused on positive synergistic effects (the emergence of more HCR than the simple aggregation of individual-level human capital), our theory implies a dark side, too, in which HCR emergence leads to negative synergies (see Steiner, 1972, on "process loss"). While our theory specifies how social interactions create positive synergies, research should identify negative synergies to explain when HCR will be lower than the individual contributions.

Second, we focused on the internal social capital mechanisms most likely to influence HCR emergence. Research should also consider the role of external social capital—that is, social capital that exists between individuals in the unit and those outside the unit. External social capital may change individual human capital. This could influence the HCR emergence process by indirectly changing the amount or type of human capital available during the emergence process. Like human capital, external social capital might not be made accessible for unit-level purposes. Therefore, considering the impact of external social capital on an individual's human capital could provide valuable insights.

Third, further consideration of the properties of the unit and the level of analysis should be incorporated into research. Our theory generally considers the emergence process of a unit. However, units may vary in size, and it is unclear how unit size would impact the social component. HCR may emerge in large groups, but the nature of social interactions underlying the emergence process may be complex and incorporate intergroup as well as intra-group interactions. For instance, smaller units might promote relational social capital simply by virtue of their structure and the opportunity to interact with members regardless of the formal structures of the hierarchy or task. Similarly, the level of slack resources may also facilitate strategic change (Bentley & Kehoe, 2020) that could then facilitate HCR emergence (Gerhart & Feng, 2021).

Fourth, although we have simplified our theory by assuming a constant task, the task and team environment can be expected to shape the HCR emergence processes (Nyberg & Reilly, 2019). For instance, a unit's task may demand a more homogenous or heterogeneous human capital, or constrain the formal structure of a unit, and thereby determine the pattern of social interactions and process. For instance, a marketing team may need workers with more heterogeneous human capital to complete tasks such as designing advertisements, leveraging social media, and managing clients. Although we expect the central elements of HCR emergence theory to hold under a broad range of conditions, future research into the moderating influence of the environment will be valuable for understanding its limits and nuances.

Fifth, HCR emergence theory raises questions about special cases wherein human capital is housed in star employees. "Stars" are "employees with disproportionately high and prolonged (a) performance, (b) visibility, and (c) relevant social capital" (Call, Nyberg, & Thatcher, 2015: 623), implying an impact on the emergence process through social capital. While engaging stars in practices that promote HCR emergence could burden stars' productivity (Oldroyd & Morris, 2012), their extraordinary social capital also means that stars may disproportionately influence the emergence process. Further, a potential source of value creation, recognized in Kehoe, Lepak, and Bentley's (2018) typology of stars, is their influence on colleagues. For example, to the extent that stars share knowledge, they may help establish a culture of knowledge sharing that will foster HCR emergence processes, helping create higher amounts of HCR. In contrast, if a star works secretively or hoards information, this too would shape the norms and practices of

the star's colleagues (Kehoe et al., 2018), and the resulting climate of secrecy would likely diminish the HCR emergence process, leading to lower amounts of HCR. Likewise, the extent to which stars auction their services or help create value for their current firm will also help establish the firm's culture (Kang, Oldroyd, Morris, & Kim, 2018), thereby also affecting the HCR emergence process. Future research should also examine the influence of human resource practices that can affect the relationship between stars and the HCR emergence process (Morris, Alvarez, & Barney, 2021).

CONCLUSION

We incorporate social capital research into the HCR literature to provide insights into HCR emergence by introducing the *HCR emergence theory*. In doing so, we highlight social capital's influential role in HCR emergence, and develop theory about how social interactions lead to HCR emergence. We develop specific, testable propositions that further inform these relationships, including when and how social capital may make human capital more available, accessible, and better coordinated. HCR emergence theory challenges current conceptualization of the HCR emergence process by showing how, why, and when social capital structure, relational content, and cognitive content influence HCR emergence.

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