

## HOW MATCHING CREATES VALUE: COGS AND WHEELS FOR HUMAN CAPITAL RESOURCES RESEARCH

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Using selection- and adaptation-based logic, we develop a dynamic matching model to describe how employees are matched with positions to enhance human capital-based value creation. Matching, defined as the process by which individuals are dynamically aligned with organizations and the situations (roles, jobs, tasks, etc.) within them, has historically been examined in silos across a broad range of literatures. Consequently, we know little about how seemingly diverse HR activities, such as recruitment, job design, training, promotions, and terminations, might inform each other through the common lens of matching. Emanating from our review, we integrate relevant literatures to develop a comprehensive matching model (termed the “dynamic matching lifecycle model”). Our model extends prior, more static conceptualizations of matching (like attraction, selection, attrition, or ASA) to include four stages: creation, development, reconfiguration, and termination—based on two broad mechanisms—selection and adaptation. Furthermore, we describe how matching contributes to individual and organizational value creation. By evoking human capital theories, we explain how people and organizations engage in matching across the four stages of the model to create human capital-based value. Our model shows that information and information distribution, organization design, and complementarities play important roles in ensuring successful matching. Promising future research directions are discussed.

Matching is the process by which individuals are dynamically aligned with roles, jobs, situations, and tasks within organizations. Match quality informs employee and organizational outcomes such as job satisfaction and newcomer commitment (Allen & Meyer, 1990; Ashforth & Saks, 1996; Cooper-Thomas, van Vianen, & Anderson, 2004), individual and organizational productivity, improved organizational financial results, and market performance (Dyer & Reeves, 1995; Lazear & Oyer, 2013; Paauwe, 2009). Despite its prominence, there is no comprehensive matching literature. Instead, matching research focuses on specific HR activities such as staffing (e.g., Ployhart, 2006), turnover (e.g., Hom, Lee, Shaw, & Hausknecht, 2017), training (e.g., Aguinis & Kraiger, 2009), job design (e.g., Parker, van den Broeck, & Holman, 2017), and promotions (e.g., Bidwell, 2011). To overcome the lack of integration, we review

relevant psychology, organizational behavior, HR, strategy, labor economics, and organizational sociology literatures. Working iteratively between our review and working typology, we develop a comprehensive matching model, which we call the “dynamic matching lifecycle model.”

Our work makes four primary contributions. First, our comprehensive matching model extends traditional conceptualizations of matching such as attraction-selection-attrition (ASA) that assume that individuals must select or adapt to fixed situations (Lazear, 2009). Instead, we posit that individuals are sometimes fixed and situations can or should be developed (Beer, Finnström, & Schrader, 2016; Follmer, Talbot, Kristof-Brown, Astrove, & Billsberry, 2018; Roberts, 2006). Our review will enable matching researchers across disciplines to view matching holistically rather than myopically.

Second, we stress that exogenous or endogenous forces often challenge complex, unstable matches at

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each stage of matching. We argue that match quality requires dynamic, adaptive matching activities. Our dynamic model shows how matching can support organizational flexibility (Wright & Snell, 1998) and enhance human capital resources<sup>2</sup> (HCRs) (Sirmon, Hitt, & Ireland, 2007; Sirmon, Hitt, Ireland, & Gilbert, 2011). Furthermore, by recognizing the role of time, we show that match quality is a function of people, situations, and time (George & Jones, 2000; Mitchell & James, 2001).

Third, our model suggests a middle-range theory (Hedström & Ylikoski, 2010; Merton, 1968) of strategic organizational behavior (Ployhart, 2015) and a theoretical foundation for the emerging HCR field (Nyberg & Moliterno, in press) by bridging micro-based theories of person–environment fit and macro-based theories of competitive advantage. Thus, we explicate a human capital-based mechanism through which matching and match quality produce individual and organizational outcomes.

Finally, we highlight a systems conceptualization, in line with strategic HR research acknowledging the impact of HR systems rather than single HR practices (Chadwick, 2010; Delery & Doty, 1996; Gerhart, 2007a; Jiang, Lepak, Han, Hong, Kim, & Winkler, 2012; Kepes & Delery, 2010). Our model shows that we must consider that matching occurs in external and internal labor markets, thus highlighting the importance of information, information asymmetries, organization design, and complementarities when establishing matching activities.

In summary, we view matching as a complex and delicate challenge. If done well, it creates “economic value of a magnitude that few other economic processes can” (Lazear & Oyer, 2013: p. 492); if done poorly, it destroys economic value. We now briefly describe the dynamic matching lifecycle model that guides our review.

## DYNAMIC MATCHING LIFECYCLE MODEL

### Definitions

We define *matching* as the process by which individuals are dynamically aligned with organizations and the situations (roles, jobs, tasks, etc.) within them. Matching is enacted within the context of the employer–employee relationship. Psychology

adopts the person–situation perspective explaining that behavior is a function of persons and situations. Based on this logic, a *match* can be defined as an employment relationship between a person and an organization, where employment is the person’s relevant situation. Matches are assessed by *match quality*, defined as the degree of compatibility (Kristof-Brown, Zimmerman, & Johnson, 2005), congruence, or “similarity between the person and environment” (Edwards, 2008: p. 168). The person–environment fit literature (P-E fit) explains that strong P-E fit indicates high-quality matches (Edwards, 2008; Kristof, 1996; Kristof-Brown et al., 2005). For this study, however, we do not review the narrower P-E fit literature because we view matching more broadly as a comprehensive value creation mechanism in organizations.

### Assumptions

We base our study on four assumptions. First, individuals and organizations are heterogeneous: “Matching firms with workers would be an easy process if labor were a commodity like some other inputs. However, labor is probably the most heterogeneous of all inputs in production functions” (Lazear & Oyer, 2013: p. 492). If individuals were homogeneous, organizations could randomly select employees. Likewise, if organizations were homogeneous, job seekers could randomly select employers without harming their outcomes.

Second, we assume “nested heterogeneity” (Felin & Hesterly, 2007). That is, matching is multilevel and multidimensional. Employees have varying knowledge, skills, abilities, and other attributes (KSAOs), whereas organizations have varying jobs, tasks, inducements, and other attributes. Thus, individual and situational attributes are micro-foundational building blocks of matches and matches are meso-level building blocks of organizations (Felin & Hesterly, 2007; Felin, Foss, & Ployhart, 2015). Without individual and organizational heterogeneity, organizations could randomly place employees without affecting organizational performance, and individuals could randomly change positions without affecting their careers.

Third, matches are unstable. Individuals and situations are complex, so we must avoid simplistic and unrealistic assumptions that matches remain static. Instead, situations may change frequently, suddenly, and dramatically as employees develop new skills or new technologies are introduced.

Fourth, we assume that matches are created and revised based on available information, but low-quality

<sup>2</sup> HCRs indicate the capacity of human capital accessible for organizationally relevant purposes (Ployhart, Nyberg, Reilly, & Maltarich, 2014) and are distinct from simple human capital that consists of economically relevant knowledge, skills, abilities, and other individually owned characteristics (Nyberg & Moliterno, in press).

matches are possible or even likely, because of information asymmetries and strategic, opportunistic behaviors (Bangerter, Roulin, & König, 2012). Institutional designs may shape the distribution and use of information for matching. For example, legislation governing external labor markets may prohibit employers from discriminating during selection. Similarly, performance appraisals, which may vary in fairness and transparency, govern information used in internal labor markets. In this study, we analyze strategic organization design parameters that affect matching.

### Dynamic Matching Lifecycle Model

Our dynamic matching lifecycle model (Figure 1) identifies four stages emanating from the two mechanisms of selection and adaptation: creation, development, reconfiguration, and termination. Most models of matching and organizational evolution, such as the ASA model, focus on the selection mechanism (Schneider, 1987). The ASA model asserts that organizations evolve as employees select the organization (the creation stage). In addition, because individuals are attracted to organizations with similar coworkers, and low-quality matches will encourage departures (the termination stage), organizations become increasingly homogenous over time (Schneider, 1987; Schneider, Goldstein, & Smith, 1995; Schneider, Smith, Taylor, & Fleenor, 1998).

However, ASA fails to consider that both employees and organizations can actively improve initial low-quality matches (Roberts, 2006). For example, information deficiencies are particularly salient when matches are created. Both employers and job seekers make assessments according to available information that may be asymmetrically distributed (Oyer & Schaefer, 2011) and allow opportunistic behaviors (Bangerter et al., 2012) such that suboptimal matches result. In response, employees may use job crafting to change their circumstances (Pieper, Trevor, Weller, & Duchon, in press; Wrzesniewski & Dutton, 2001) or organizations may adjust job designs to improve match quality before choosing termination. Therefore, we extend the ASA model (and similar traditional models) to argue that both *selection* and *adaptation*<sup>3</sup>

lead to organizational evolution (Hannan & Freeman, 1977; March, 1991; Simon, 1991).

The matching literature often overlooks the strong, dynamic element of adaptation. Our dynamic matching lifecycle model suggests that adaptive matching occurs first at the development stage when employees adapt to situations or situations change to better fit employees and secondly at the reconfiguration stage via internal mobility. Although we treat the development and reconfiguration stages as independent, they are potentially interdependent. For instance, internal mobility (e.g., an expatriate assignment) can change employee aspirations (Woods, Lievens, De Fruyt, & Wille, 2013) or cause jobs to be redesigned (Roberts, 2006). Thus, adaptive matching may develop or reconfigure low-quality matches.

## MATCHING PROCESSES—LITERATURE REVIEW

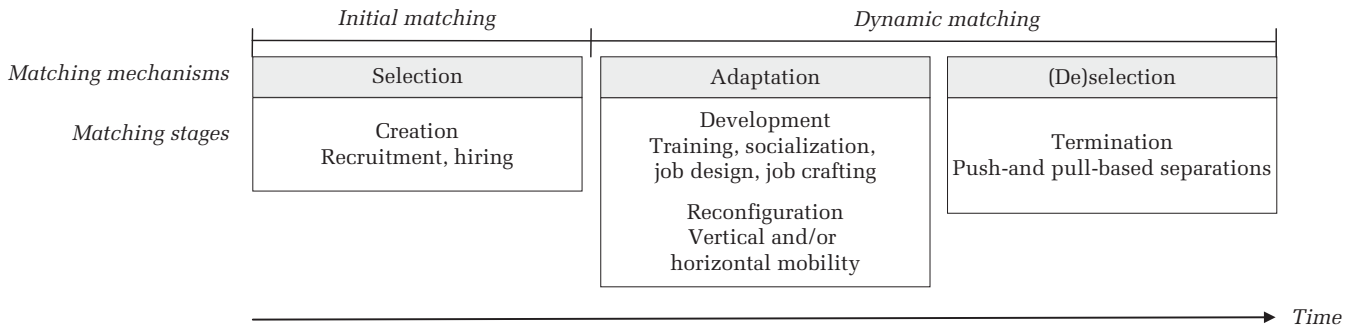
### Creation Stage of the Dynamic Matching Lifecycle Model

The creation stage of the dynamic matching lifecycle model (Figure 1) relates primarily to recruitment and hiring processes. We do not provide an in-depth analysis of this literature because comprehensive reviews exist in economics by Mortensen and Pissarides (1999), Lazear and Oyer (2013), and Oyer and Schaefer (2011) and psychology by Breaugh (2013), Breaugh and Starke (2000), Chapman, Uggerslev, Carroll, Piasentin, and Jones (2005), Ployhart (2006), Ryan and Ployhart (2014), Rynes (1991), Rynes and Cable (2003), Sackett and Lievens (2008), Schmidt and Hunter (1998), and Tippins (2015), among others. Instead, we combine these literatures and focus on the aspects relevant to matching.

**Recruitment.** Economics-based recruitment theories assume that in perfect labor markets, wage levels determine whether workers are willing to work (Ehrenberg & Smith, 2016). Economics further assumes that both labor supply and demand are homogenous and perfectly informed. However, labor markets are neither homogenous nor perfectly informed, so more realistic assumptions are needed to explain how heterogeneous individuals and organizations and various informational problems affect outcomes. In reality, organizations must generate sufficiently large pools of high-quality applicants (Barber, 1998; Boudreau & Rynes, 1985; Collins & Han, 2004; Rynes, 1991). However, large pools, that may still inhibit significant heterogeneity, make it difficult to create initial high-quality matches. More specifically, recruitment decisions are often

<sup>3</sup> Organization theory identifies *selection* and *adaptation* as the primary mechanisms of organizational evolution (e.g., Astley & Van de Ven, 1983; Levinthal & Posen, 2007; Scott, 1987). Adaptation mechanisms are seldom considered in matching models (Follmer et al., 2018; Roberts, 2006) because selection and ASA-based logic dominate the relevant psychological literatures (Beer et al., 2016).

**FIGURE 1**  
**Dynamic Matching Lifecycle Model**



imperfect because individuals and organizations are unaware of available alternatives, cannot accurately process all relevant information, and may draw the wrong conclusions from the information available.

Organizations and job seekers initially have minimal knowledge about each other. When they behave opportunistically by providing misleading information, initial matching efforts are inhibited. If both parties involved were perfectly informed, opportunistic behaviors would be uncovered and affected parties could counteract, but instead opportunistic behaviors may go undetected, resulting in the prisoner’s dilemma: At first, both parties behave opportunistically to close the match, but their opportunism inhibits their ability to achieve high-quality matches (Bangerter et al., 2012). For example, job seekers may purposely enhance their resumes, or organizations may mislead job seekers about the organizational culture (Bergh, Connelly, Ketchen, & Shannon, 2014). We argue that credible signals, realistic job previews (RJP), referral networks, and labor market intermediaries can overcome imperfect information and initial match uncertainty for the sake of better quality matches.

Signals can potentially overcome initial match uncertainty (Bangerter et al., 2012; Connelly, Certo, Ireland, & Reutzel, 2011; Spence, 1973, 2002). The signaling model (Spence, 1973) assumes that desirable attributes may be hard to verify during recruitment processes because job seekers may make false claims, but some observable attributes may signal hard-to-verify attributes. For example, education can credibly signal ability. Under the assumption that more able individuals have lower costs for obtaining education, a separating equilibrium results where more able individuals have educational degrees and less able individuals cannot afford to attain them. Employers may then use education as a signal indicating an able applicant and search for that signal (education) within the labor market (Farber & Gibbons, 1996). Similar examples of costly and credible ability signals include job assignments and promotions (DeVaro & Waldman, 2012; Ricart i Costa, 1988; Trevor, Gerhart, & Boudreau, 1997; Waldman, 1984), job retention (Waldman, 1990), and the organizational status of previous employers (Bidwell, Won, Barbulescu, & Mollick, 2015).

Firms can also use signals to attract job seekers. For example, corporate social responsibility initiatives may signal important, hard-to-verify, positive employee

**FIGURE 2**  
**Matching Systems and External Alignment**

	Strong formalization	Weak formalization
Centralization	Quadrant 1: Traditional internal labor markets	Quadrant 2: Talent networks
Decentralization	Quadrant 3: Local optimizers	Quadrant 4: Talent adhocarcy

orientations (Fulmer, Gerhart, & Scott, 2003; Jones, Willness, & Madey, 2014). In addition, apprenticeship programs indicate support of long-term, trustworthy employment relationships (Backes-Gellner & Tuor, 2010). Thus, signaling may lead to more informed self-selection decisions and higher quality initial matches, attracting job seekers hoping to be well matched (Chapman et al., 2005; Rynes, Bretz Jr., & Gerhart, 1991; Uggerslev, Fassina, & Kraichy, 2012).

Realistic job previews (RJP; Weller, Michalik, & Mühlbauer, 2013, for an overview) are a second mechanism for overcoming initial match uncertainty and have generated much attention in studies of recruitment issues (Phillips, 1998; Rynes, 1991). That is, RJP might screen out individuals who are likely to quit because they are poorly matched with the organization (Wanous, 1973; Weitz, 1956). Whereas signaling assumes that labor market agents are opportunistic, the RJP literature argues that self-selection decisions are improved when organizations deliver accurate pictures rather than yield to opportunistic temptations to sell their organizations to applicants (Wanous, 1992).

Referral networks are another mechanism for overcoming initial match uncertainty (Granovetter, 1995; Montgomery, 1991; Pieper, 2015; Rees, 1966; Reid, 1972; Topa, 2011; Ullman, 1966). Indeed, firms fill 30 percent to 50 percent of their vacancies through referral networks (Bewley, 1999; Fernandez, Castilla, & Moore, 2000; Granovetter, 1995), likely because referrers are particularly well positioned to screen the labor market (Rees, 1966) and suggest suitable applicants (Pallais & Glassberg Sands, 2016) for initial high-quality matches (Burks, Cowgill, Hoffman, & Housman, 2015; Fernandez et al., 2000; Pieper et al., in press). Whereas signaling and RJP assume that uncovering or avoiding opportunistic behaviors will overcome information problems, referral networks provide informational, reputational, and cost advantages (Fernandez et al., 2000; Marsden & Gorman, 2001; Pieper, 2015). When friends serve as referrals, they are likely to go beyond simple job descriptions to reveal whether prospective workmates will be congenial, whether bosses are difficult, and whether the company is moving in a desirable direction (Granovetter, 1995). Newcomers who have been referred by friends and acquaintances are most likely to have accurate and realistic job information (e.g., Blau, 1990; Breugh & Mann, 1984; Moser, 1995; Quagliari, 1982; Saks, 1994; Werbel & Landau, 1996; Williams, Labig, & Stone, 1993) and are less likely to quit early (Weller, Holtom, Matiaske, & Mellewig, 2009). Sociologists and economists also

indicate that both referrers and referred have ties and reputations at stake that could be damaged by a low-quality match (Kugler, 2003; Marin, 2012; Rees, 1966; Smith, 2005). As a third benefit, referral networks may also help hiring firms deal with job seekers' sequential search and decision processes (Sterling, 2014) and may even be an effective motivational force (Beaman & Magruder, 2012; Pieper et al., in press).

Labor market intermediaries, a fourth mechanism for overcoming initial match uncertainty (Autor, 2001a, 2001b, 2009; Bonet, Cappelli, & Hamori, 2013), include information brokers, headhunters, and executive search firms who use specialized industry and/or occupational knowledge to create initial high-quality matches (Bidwell & Fernandez-Mateo, 2010). Sometimes considered the new paradigm for HR and talent management (Bonet et al., 2013), labor market intermediaries enable firms to acquire human capital on demand, just in time (Cappelli, 2008, 2009; Cappelli & Keller, 2013, 2014). Despite scholarly attention to labor market intermediaries (Cappelli & Hamori, 2014; Finlay & Coverdill, 2007), we lack evidence concerning poaching and unsolicited job offers that may reach both active and passive job seekers (Lee, Gerhart, Weller, & Trevor, 2008).

**Hiring.** Once job seekers are in the applicant pool, employers shift their focus from missing potential applicants to identifying the best quality matches (Kristof-Brown, 2000) using personnel selection tools, screening, and reputation. The psychology and OB literatures (Ryan & Ployhart, 2014; Sackett & Lievens, 2008; Sackett, Shewach, & Keiser, 2017; Schmidt & Hunter, 1998) identify personnel selection tools as a way to acquire predictive validity regarding match quality (Schmidt & Hunter, 1998). Because the selection literature is well documented and well known in the management field, we refer readers to the reviews we have mentioned.

Economics literatures emphasize screening as another mechanism for identifying initial high-quality matches. Screening, in this literature, means that employers provide employees with contract choices. Based on the employees' decisions, otherwise unobservable job seeker attributes are revealed (Bartling, Fehr, & Schmidt, 2012; Huang & Cappelli, 2010). For example, a piece-rate, pay-for-performance scheme rather than a fixed-pay scheme signals that the company values individual performance. A seminal study of Safelite Glass Corporation showed that when the company changed its fixed-pay scheme to pay-for-performance, productivity increased by 44 percent, partially because higher performers were attracted who

expected a superior match quality given a pay-for-performance plan (Lazear, 2000). Management scholars have come to similar conclusions regarding self-selection, sorting, and signaling effects of variations in pay schemes (Gerhart & Fang, 2014; Shaw, 2014, 2015).

The personnel selection and screening literatures tend to focus on how companies choose high-quality entry-level workers or newcomers to the workforce from large applicant pools (e.g., college recruitment; Rynes, Orlitzky, & Bretz, 1997), but pay less attention to long-term workers (Ployhart, 2006) and small applicant pools (Scullen & Meyer, 2014). Thus, we know relatively little about how firms assess matches for roles such as CEOs hired from the external labor market (Cragun, Nyberg, & Wright, 2016). When CEOs or managers are hired internally through promotions or transfers, firms usually base their assessments on performance evaluations (DeNisi & Smith, 2014; Levy, Tseng, Rosen, & Lueke, 2017; Rynes, Gerhart, & Parks, 2005). In addition, few researchers have explored how high potential individuals are hired for the long term. For example, companies may intentionally place university graduates or applicants with high potential in short-term rotational programs with initially suboptimal match quality, believing that the experience will lead to superior performance later.

Another hiring tool is to assume the quality of job seekers based on the reputation of their social contacts. An underlying assumption is that individuals tend to have homophily with similar others, an idea that also guides the attraction phase within the ASA model. For example, individuals who are referred by strong performers tend to receive more job offers than those who are referred by poor performers (Pieper et al., in press; Yakubovich & Lup, 2006). As a result, organizations may hire job seekers associated with high performers.

### **Development Stage of the Dynamic Matching Lifecycle Model**

In the development stage, match quality is improved when employees acquire KSAOs that the organizations requests, or when the job is redesigned to better fit the employee. In this section, we focus on training, socialization, job design, and job crafting as four ways to improve match quality through development.

**Training.** Training teaches employees about organizational norms and procedures (Goldstein & Ford, 2002) and provides the knowledge, skills, and experiences necessary for current and/or future roles within the organization (Aguinis & Kraiger, 2009; Barber, 2004; Davis & Yi, 2004; Lambooi, Flache,

Sanders, & Siegers, 2007). First, organizations often assess training needs to choose the most appropriate training for the employee (Arthur, Bennett Jr., Edens, & Bell, 2003; Goldstein, 1993; Salas & Cannon-Bowers, 2001) and then select the most appropriate training styles (e.g., formal) and delivery methods (e.g., online) (Aguinis & Kraiger, 2009). Training success depends on how well employees apply the knowledge and skills to actual behaviors (Blume, Ford, Baldwin, & Huang, 2010). More simply, success depends on the degree to which match quality is improved.

Economists argue that employee or employer-driven training is an investment in human capital (Becker, 1962, 1964; Lazear, 2009; Mincer, 1974) that increases productivity and wages. General human capital is valuable in all firms and can be transferred across employments to improve match quality. By contrast, firm-specific human capital enhances match quality within the current firm only because there is no efficient labor market for it (Becker, 1964; Campbell, Coff, & Kruscynski, 2012; Weller, in press). Firm-specific training correlates with tenure; as tenure progresses, match quality improves and wages increase (Mincer & Jovanovic, 1981; Polachek & Siebert, 1993; Topel, 1986, 1991). Some uncertainty remains regarding whether training or sorting lead to higher match quality and wages (Abraham & Farber, 1987; Altonji & Shakotko, 1987; Altonji & Williams, 2005; Kletzer, 1989; Topel, 1991), but generally speaking, firm-specific human capital improves worker standing through high-quality matches in the current firm.

**Socialization.** Newcomers often experience some shock and surprise when they begin working for new organizations (Miller & Jablin, 1991; Van Maanen & Schein, 1979). Consequently, insiders often give newcomers the information they need to become accustomed to new rules and cultures (Bauer, Morrison, & Callister, 1998; Ellis, Bauer, & Erdogan, 2016; Jones, 1986; Miller & Jablin, 1991), to gain role clarity and self-efficacy, and to perceive social acceptance (Bauer, Bodner, Erdogan, Truxillo, & Tucker, 2007; Cooper-Thomas et al., 2004; Louis, 1980) and match quality (Berger & Calabrese, 1975; Jones, 1986; Saks & Ashforth, 1997; Van Maanen & Schein, 1979).

Early support from managers and coworkers increases the likelihood of socialization (Kammeyer-Mueller, Wanberg, Rubenstein, & Song, 2013) and indicates that the organization values newcomers (Aguinis & Kraiger, 2009; Bartlett, 2001; Bartlett & Kang, 2004). Socialization processes can be institutionalized, employer-driven, and designed to encourage

newcomers to conform to the status quo (Jones, 1986), such as through job rotations that provide comprehensive understanding of operations and exposes newcomers to key stakeholders (Campion, Cheraskin, & Stevens, 1994). In addition, socialization processes can be individualized, employee-driven proactive efforts to learn organizational norms, rules, and processes, and possibly question the status quo (Jones, 1986).

**Job design.** The training and socialization literatures assume that individuals are trained and developed to fit fixed jobs and roles, whereas the job design literature recognizes that situations can be changed to develop high-quality matches. Traditional work design literature (Hackman & Lawler, 1971; Hackman & Oldham, 1974, 1975, 1976) assumes that managers or leaders design jobs to improve motivation, satisfaction, and performance, and reduce absenteeism and turnover (Hackman & Lawler, 1971; Hackman & Oldham, 1975), adhering to a traditional leader–follower understanding of leadership but neglecting critical aspects of modern work (Oldham & Hackman, 2010). For example, traditional work design research largely assumed face-to-face work interactions (Gibson, Gibbs, Stanko, Tesluk, & Cohen, 2011), which occur less often in modern telecommuting roles (Grant, Fried, & Juillerat, 2011; Grant & Parker, 2009) or in project-based and globally distributed virtual teams (Gajendran & Joshi, 2012; Maynard, Mathieu, Rapp, & Gilson, 2012; Wageman, Gardner, & Mortensen, 2012).

In response, many scholars now focus on proactive job design activities (Bakker, Tims, & Derks, 2012; Grant, 2007; Grant & Ashford, 2008; Grant & Parker, 2009; Parker et al., 2017; Spreitzer, Cameron, & Garrett, 2017) through individual agency (Demerouti, Nachreiner, Bakker, & Schaufeli, 2001; Follmer et al., 2018; Ilgen & Hollenbeck, 1991; Parker et al., 2017; Wrzesniewski & Dutton, 2001). Most work situations have some degree of misfit, so that individuals are often “active, motivated creators of their own fit experience” (Follmer et al., 2018: p. 440), who try “to shape their work to better suit their needs” (Roberts, 2006: pp. 21–22) either consciously or unconsciously. Thus, we suggest that matching processes such as job crafting are essential for a more comprehensive view.

**Job crafting.** Employees may proactively improve match quality by altering job dimensions through individual or collaborative job crafting (Leana, Appelbaum, & Shevchuk, 2009; Wrzesniewski & Dutton, 2001). By improving match quality, job crafting produces positive outcomes such as work engagement, motivation, and in-role performance

(Bakker et al., 2012; Parker & Ohly, 2009; Tims, Derks, & Bakker, 2016).<sup>4</sup> For example, a study of call center agents (Pieper et al., in press) showed that agents used a referral recruitment program to socially enrich their work environment such that they had higher job performance and lower turnover likelihood when their referrals were hired and present. Job crafting can occur at any time in the employment relationship (Tims, Bakker, & Derks, 2014), and even extend to leisure activities (Berg, Grant, & Johnson, 2010; Vogel, Rodell, & Lynch, 2016). For instance, when job seekers join firms, they may negotiate “I-deals” such as childcare arrangements that diverge from arrangements with other employees performing the same tasks (Rousseau, Ho, & Greenberg, 2006).

Researchers have paid surprisingly little attention to the interplay of training/socialization and job design/job crafting. To reiterate, in the development stage, persons are usually expected to adapt. But persons and situations might adapt. For example, training often fails because newly trained employees often return to their jobs without applying their new knowledge and skills (Beer et al., 2016). Instead, training and job design might adapt simultaneously.

### Reconfiguration Stage of the Dynamic Matching Lifecycle Model

Match quality can also be improved by reconfiguring current HCR and situations, typically via internal mobility. In this section, we focus on vertical promotions and horizontal mobility through transfers. Promotions and transfers are key elements of so-called internal labor markets, a system of market-based or relational HR practices (Keller, 2018) that govern individual mobility along the hierarchy (Bidwell, 2011; Bidwell & Keller, 2014; Cappelli & Cascio, 1991; Waldman, 2013). The internal labor market concept originated in sociology (Doeringer & Piore, 1971). In the traditional model, workers join at entry levels (ports of entry), higher level vacancies are filled from within, wages are attached to jobs rather than individuals, and mobility occurs along defined job ladders (Althauser & Kalleberg, 1981; Kalleberg & Sørensen, 1979). Internal labor markets

<sup>4</sup> Job crafting is also linked to the organizational citizenship behavior (OCB) literature (Organ, 1988; Podsakoff, MacKenzie, Paine, & Bachrach, 2000). However, because OCB describes discretionary behaviors serving organizational purposes, we do not discuss the OCB literature in detail.

signal that organizations and employees have a mutual interest in long-term employment relationships, and help overcome informational and incentive problems that arise in such long-term relationships (Pfeffer & Cohen, 1984; Rosen, 1988).

Early research on internal labor markets was mostly descriptive (Alexander, 1974; Baker, Gibbs, & Holmström, 1994; DiPrete, 1987; Konda & Stewman, 1980; Pfeffer & Cohen, 1984) but evolved as lifetime employment became rarer and external hires were used more frequently to fill vacancies at all levels (Bidwell, 2011; Lazear & Oyer, 2004; Royal & Althausen, 2003). Consequently, research has shifted to examining hiring, promotions, and transfers as alternative processes for filling vacancies and affecting match quality (Bidwell, 2011; Brett & Stroh, 1997; Chan, 1996, 2006; DeVaro & Morita, 2013). We follow the evolution and refer to internal labor markets more broadly to embrace all organizational vertical and horizontal moves. We further stress the employer-learning perspective regarding within-organization moves.

**Vertical mobility.** Promotions, a key mechanism for improving match quality, are vertical moves to jobs of “higher administrative rank and usually associated with higher pay, status, responsibilities, and skill requirements” (Bidwell, 2011: p. 372), enabling highly able employees to find high-quality matches in higher positions (Gibbons & Waldman, 1999).

Economists use a tournament lens to argue that promotions motivate employees to acquire firm-specific human capital (Cappelli & Cascio, 1991; DeVaro & Waldman, 2012; Gibbons & Waldman, 1999, 2006; Lazear & Rosen, 1981; Rosenbaum, 1979; Waldman, 1990, 2013). The most promising employees are selected for promotion, similar to tournaments in which prizes are awarded to winners. Promotion opportunities decline at higher ranks, so the organizational hierarchy often has convex wage curves to compensate for the lack of promotion opportunities at the top of the pyramid (Eriksson, 1999; Gibbons & Waldman, 1999; Lambert, Larcker, & Weigelt, 1993; Rosen, 1986; Waldman, 2013). A special form of promotion tournaments is up-or-out contracts (Kahn & Huberman, 1988; Waldman, 1990) in which organizations terminate low-quality matches and retain only highly eligible employees. The out condition is necessary because initial selections are imperfect in every round of draws. When only some part of entry hires are promoted, the lower levels are soon overpopulated with low-quality matches, whereas further promotions and new intakes are prohibited.

Because promotions enable highly able employees to move into positions with a larger scale of operations (Gibbons & Waldman, 1999), they help improving match

quality and organizational performance alike. Along the same line, the gravitational hypothesis in OB (Wilk, Desmarais, & Sackett, 1995; Wilk & Sackett, 1996) suggests that employees sort into jobs that match their abilities and that initial low-quality matches lead to gravitation into more complex jobs with higher job requirements and organizational relevance over time (Wilk et al., 1995).

However, promotion tournaments also have downsides. For instance, they create bias toward insiders (Bidwell & Keller, 2014; Chan, 1996, 2006). Companies may choose a lower quality match and reject an attractive external candidate (Waldman, 2003) who might have increased the organization’s innovative potential and broken the rigidities that may occur from internal promotions (March, 1991). Hence, firms may incur opportunity costs when they retain and promote insiders rather than seek external candidates.

**Horizontal mobility.** Another mechanism to improve match quality is horizontal mobility through transfers “when individuals remain within the same vertical rank but move to a different organizational unit or a different kind of job” (Bidwell, 2011: p. 372). Rather than quit, employees who find themselves in low-quality matches can initiate within-firm transfers (Dalton, 1997; Dalton & Todor, 1987; Mobley, Griffeth, Hand, & Meglino, 1979), such as by accepting expatriate assignments (Vaiman, Haslberger, & Vance, 2015), joining new teams and projects, or transferring across units to bridge short-term labor demands (Dohmen, Kriechel, & Pfann, 2004; Reilly, Nyberg, Maltarich, & Weller, 2014) and overcome market frictions (Belenson & Tsolmon, 2016). Economists also discuss the role of job rotations in accumulating firm-specific human capital (i.e., *employee learning*) and knowledge about an employee’s KSAOs (*employer learning*), which can be leveraged to create high-quality matches (Arya & Mittendorf, 2004; Campion et al., 1994; Eriksson & Ortega, 2006; Kampkötter, Harbring, & Sliwka, 2018; Meyer, 1994; Ortega, 2001; Prescott & Townsend, 2006).

**Employer learning.** Internal learning opportunities are often well suited for conveying matching advantages. Employees and organizations learn from each other (Jovanovic, 1979; Nelson, 1970) either symmetrically so that all labor market parties, whether external or internal, have equal learning chances (Altonji & Pierret, 2001; Farber, 1999; Farber & Gibbons, 1996; Gibbons & Waldman, 1999; Harris & Holmström, 1982), or asymmetrically in which learning results in private knowledge (Acemoglu & Pischke, 1998; Milgrom & Oster, 1987; Ricart i Costa, 1988; Waldman, 1984, 1990).

Models of symmetric learning explain that internal matching increases wages (Jovanovic, 1979; Oyer &



Schaefer, 2011) because employees can market observable KSAOs to the focal firm and competitors. Asymmetric learning models assume that organizations have informational advantages allowing them to improve matches (Oyer & Schaefer, 2011). For example, managers can use private knowledge to promote the most eligible employees into more demanding jobs that will optimally use their skills. In line with these assumptions, research finds that, initially, internally promoted employees tend to perform better than external hires (Bidwell, 2011; Bidwell & Keller, 2014; Kampkötter & Sliwka, 2014), and job rotations have decreasing returns with tenure because employers know more about tenured employees than they know about new recruits (Campion et al., 1994; Ortega, 2001).

Asymmetric information and employer learning also explain why organizations are sometimes willing to invest in general human capital (Acemoglu & Pischke, 1998; Cappelli, 2004; Katz & Ziderman, 1990). Information asymmetries generate monopsony power that firms can purposefully use for matching decisions (Chang & Wang, 1995, 1996; Katz & Ziderman, 1990). For example, firms can invest in apprenticeship programs that reveal abilities and allow better matching decisions for those who are retained (Acemoglu & Pischke, 1998). However, when organizations retain and promote only able employees, rivals can judge the quality of workers by observing the organization's retention decisions (Waldman, 1990), job assignments, and regular promotions (Milgrom & Oster, 1987; Ricart i Costa, 1988; Spence, 1973; Waldman, 1984), a view partly supported by empirical research (Nyberg, 2010; Trevor et al., 1997). That is, internal labor markets have information advantages but create opportunities for private knowledge to become public, motivating organizations to avoid promoting employees into the best fitting situations, to hoard their talent (Lublin, 2017), or to establish fast-track careers (Bernhardt, 1995; DeVaro & Waldman, 2012; Gibbons & Waldman, 1999). As a consequence, asymmetric learning may lead to adverse selection in the external labor market (Gibbons & Katz, 1991; Greenwald, 1986) because organizations use private knowledge to remove low-ability workers, what, in turn, is anticipated by alternative employers.

### Termination Stage of the Dynamic Matching Lifecycle Model

The termination stage is similar to the creation stage in its selection logic: imperfect matches that cannot be adapted through either development or reconfiguration can be terminated. Terminations can

end low-quality matches and open searches for better fits, depending on the availability of alternatives (March & Simon, 1958; Trevor, 2001) and needs for replacements (Reilly et al., 2014). In addition, terminations can change the composition and/or size of a firm's HCR. Furthermore, employees may also quit to find better matches. We note that terminations can be strictly regulated to protect both workers and firms (e.g., to prevent knowledge leakage; Marx, Strumsky, & Fleming, 2009).

Creating, developing, or reconfiguring matches tend to be cooperative, yielding mutual benefits to employees and organizations. However, separations often involve trade-offs. For instance, employees benefit if they find a higher quality match elsewhere, but organizations suffer if they cannot adequately replace the leaver. In contrast, employees suffer from losing their jobs when being terminated, but organizations benefit by finding better replacements (Nyberg & Ployhart, 2013). Thus, from the view of the organization, losses may be either dysfunctional or functional (Dalton, Todor, & Krackhardt, 1982): low-performing leavers are functional losses; high-performing leavers are dysfunctional losses.

**Push forces.** Push and pull forces are the two prominent forces in termination processes (March & Simon, 1958). Organizations may push some employees out while investing in the retention of others (Holtom, Mitchell, Lee, & Eberly, 2008). Job dissatisfaction, a prominent push force, guides voluntary turnover research (Holtom et al., 2008; Hom et al., 2017; Hom, Mitchell, Lee, & Griffeth, 2012; March & Simon, 1958; Mobley, 1977; Nyberg, 2010). The unfolding model of voluntary turnover (Lee & Mitchell, 1994; Lee, Mitchell, Holtom, McDaniel, & Hill, 1999) further stresses that shocks, sudden events that jar organizational attachment, may cause spontaneous, scripted, or impulsive reactions that impair match quality rapidly and significantly and push employees out.

Downsizing (Baumol, Blinder, & Wolff, 2005; Trevor & Nyberg, 2008) indicates organizational policies and practices that reduce a firm's workforce to improve firm performance (Datta, Guthrie, Basuil, & Pandey, 2010). That is, many terminations may occur simultaneously to shrink a firm's HCR, to achieve a new collective equilibrium for meeting market demands (Baumol et al., 2005), and to improve overall efficiency of the remaining HCR<sup>5</sup> rather

<sup>5</sup> Trade-offs may be involved. Firms remove low performers to reduce labor costs while increasing average workforce quality, but labor market regulations may impede such efforts, such as by enforcing worker and union rights.

than the quality of individual matches. However, downsizing can harm both terminated and remaining employees because remaining employees lose trust in the employer (Trevor & Nyberg, 2008). Moreover, although terminated employees have some protections (e.g., Burgess & Low, 1992, 1998; Nord & Ting, 1991; Ruhm, 1994), termination often conveys a stigma and threatens future matching opportunities of those being laid off.

**Pull forces.** Pull forces may substantially disrupt matches by pulling employees toward better alternatives (Lee et al., 2008). According to economists (Burdett, 1978; Mortensen & Pissarides, 1999), matches often dissolve because employees learn about alternative prospects (Jovanovic, 1979). Poachers use various ways to identify KSAOs, even for employees who are not searching for other jobs. Labor market intermediaries such as headhunters, executive search firms, and talent network platforms also contribute to rising pulls.

Push and pull forces sometimes operate conjointly. For example, an employee who is denied a promotion may experience a shock that pushes them to apply elsewhere (Nyberg, 2010). While searching for other opportunities, an attractive job may also pull them away. Thus, push and pull forces may operate independently or in conjunction with each other.

## IMPLICATIONS

### Matching—A Middle-Range Theory for HCRs

The dynamic matching lifecycle model suggests a middle-range theory (Merton, 1968) of strategic organizational behavior (Ployhart, 2015) and HCR research (Nyberg & Moliterno, in press). Middle-range theorizing focuses on mechanism-based explanations (Elster, 1989; Hedström & Swedberg, 1996; Hedström & Ylikoski, 2010) to achieve both comprehensive and parsimonious explanations. For instance, our matching model extends the ASA framework by adding adaptation for a more comprehensive ASAA model including attraction, selection, adaptation, and attrition. Our model systematically connects many seemingly distinct theories and HR activities, including recruitment, hiring, training, socialization, job design, internal labor markets, and terminations. Comprehensiveness eventually leads to a more complete theoretical toolbox containing the “nuts and bolts, cogs, and wheels—that can be used to explain quite complex social phenomena” (Elster, 1989: 3).

Mechanism-based explanations are also parsimonious. Elements such as recruitment, hiring, and training are broader than matching, but our model

highlights their commonalities. Among other benefits, a parsimonious, common lens opens new interdisciplinary research allowing researchers from distinct domains to more easily communicate, cooperate, and consolidate their findings. For example, HCR research benefits from considering OB constructs, such as person–situation fit or match quality, while considering factor markets and contexts, as in strategy research.

Finally, middle-range theories are inherently multilevel (Vromen, 2010). They virtually open “black boxes” and show “the cogs and wheels of the internal machinery” (Hedström & Ylikoski, 2010: p. 56). For instance, HCR researchers study employee mobility (Mawdsley & Somaya, 2016) and star worker mobility (Call, Nyberg, & Thatcher, 2015) to show that both origin and destination firms are affected when stars move (Groysberg, Lee, & Nanda, 2008). A matching lens identifies how investments such as training and job design facilitate stardom. Moreover, employers know that coworkers enable stars to consistently perform at high levels. Although employees sometimes move in clusters (called *co-mobility*; Marx & Timmermans, 2017) and firms sometimes hire clusters of individuals (*cluster hiring*; Eckardt, Skaggs, & Lepak, 2018), no overarching theory combines star development, cluster hiring, and co-mobility research (Nyberg, Reilly, Essman, & Rodrigues, 2018). A middle-range theory can embrace hiring, training, job design, external and internal mobility, and termination activities as elements of a common, broader mechanism, which is matching.

By applying the dynamic matching lifecycle model to HCR research, we specifically contribute OB thinking to strategy theorizing about equifinality (Felin & Hesterly, 2007), systems complexity (Chadwick, 2010; Delery & Doty, 1996; Gerhart, 2007a; Jiang et al., 2012; Kepes & Delery, 2010), and managerial matching capabilities (Adner & Helfat, 2003; Helfat & Peteraf, 2015; Sirmon, et al., 2007, 2011). Before further describing these opportunities, we discuss how matching relates to individual- and organization-level outcomes, according to general human capital logic.

### How Matching Contributes to Value Creation

Match quality correlates positively with job satisfaction and individual performance (Kristof-Brown et al., 2005) and negatively with stress (Kristof-Brown & Guay, 2011) and withdrawal behaviors (Arthur, Bell, Villado, & Doverspike, 2006). However, psychology and OB researchers often use imperfect subjective methodologies to assess match quality (Edwards, 1993,

1994), meaning that match quality may have biased relationships with individual outcomes. Given that “Match quality is difficult to quantify empirically” (Centeno & Novo, 2006: p. 906), economists admit that the empirical evidence regarding the match-specific components of productivity is limited (Jackson, 2013). Thus, they often infer match quality indirectly from observing differences in wages and productivity, notwithstanding that wages and productivity fail to capture all aspects of a match.

Rather than focusing on individual-level outcomes alone, we stress that matching also facilitates organizational outcomes. Drawing from economics, we contend that matching allows organizations to generate and sustain economic rents and create competitive advantage. To explain how matching creates organizational value, we refer to the skill-weights model of human capital (Lazear, 2009), which argues that skills are combined in skill sets or bundles.<sup>6</sup> All skills are general in the sense that they create the same utility across organizations. At the same time, organizations have different uses for skills, expressed through differences in weighting schemes. For the best matches, skill sets must be well aligned with firm needs.

The skill-weights model (Lazear, 2009) explains that individuals invest in skills or seek higher quality matches outside the firm, mirroring the development and termination stages of our dynamic matching lifecycle model.<sup>7</sup> When skill needs are well aligned with skill sets, high-quality matches and human capital specificity result (Weller, in press). In other words: Matching potentially creates (firm-)specific human

capital, and facilitates the individual and organization-level benefits associated with it. However, when there are plenty of opportunities with similar skill needs, “investments that would otherwise be viewed as firm specific become more general” (Lazear, 2009: p. 925). In other words, even perfect person–situation alignments are not firm-specific when many firms value the same skill sets: some skill sets will rather be useful in industries (Mayer, Somaya, & Williamson, 2012; Neffke & Henning, 2013) and others in occupations (Geel, Mure, & Backes-Gellner, 2011). Specific human capital constrains or prevents mobility (Peteraf, 1993; Rumelt, 1984), allowing industries, occupations, firms, or even units within firms to achieve competitive advantage (Chadwick, 2017; Chadwick & Dabu, 2009; Hatch & Dyer, 2004; Mayer et al., 2012; Raffiee & Coff, 2016).

### Equifinality, Systems Complexity, and Managerial Matching Capabilities

Our model stresses that matching occurs along the four stages of the dynamic matching lifecycle model. Value creation, as we have outlined, occurs when high-quality matches are created and may lead to a competitive advantage because matching results in specific or firm-specific human capital. However, our review reveals a fragmented matching literature, and no matching stages or activities are generally preferable. More important is that distinct matching activities may generate identical results (equifinality) or be complementary or substitutive in nontrivial ways (systems complexity).

Equifinality (Felin & Hesterly, 2007) and systems complexity (Delery & Doty, 1996; Huselid, 1995; Ichniowski, Shaw, & Prennushi, 1997; Rosen, 1988) are related but different concepts. Equifinality assumes that multiple paths have identical outcomes. Thus, some firms should invest in selection efforts and others should invest in training or internal labor markets; but, both may achieve similar results. The systems complexity view is based on the concepts of fit or complementarity (Chadwick, 2010; Milgrom & Roberts, 1995). Internal fit involves the coordinated alignment of the system’s practices and processes; external fit involves the system’s alignment with the external environment. Matching potentially creates value, but equifinality and systems complexity are both opportunities and critical boundary conditions for exploiting such opportunities.

Especially systems complexity is ambiguous in that it creates potential for differentiation and competitive advantage but also managerial dilemmas (Coff, 1997). Recent research using vast datasets and sophisticated estimation techniques supports the paradoxical complexity view. A useful metric in this

<sup>6</sup> Lazear (2009) presents a simple, abstract formal model that can be generalized to more complex situations though. For instance, HCRs often have more relevant attributes than skills, and more than only two skills. Also see Gathmann & Schönberg (2010) and Yamaguchi (2012).

<sup>7</sup> Human capital models thus embrace selection and adaptation logic, but are seldom counted as matching models. Most human capital models fail to capture the full range of matching activities but are important for building a comprehensive middle-range theory of matching. Moreover, human capital logic is relatively flexible and may cover more situations than typically modeled. For example, Lazear’s (2009) model considers firms to be homogeneous units as expressed by exogenously given, stable skill-weights. However, the weighting factor may also be firm, job, and, perhaps, industry specific. For modeling purposes, nothing is changed by expanding the view to include jobs. When the weighting factor is tied to jobs, Gibbons and Waldman’s (2004) approach becomes relevant in arguing that different jobs use different “task-specific” human capital. Promotions are intended to ensure that task-specific skills are used (Lazear, 2009: pp. 929–930).

regard is the total factor productivity (TFP) concept, which suggests that more productive organizations “produce greater amounts of output with the same set of observable inputs than lower-TFP businesses” (Syverson, 2011: p. 330).<sup>8</sup> Growing evidence shows that there are large and persistent TFP differentials between firms (Syverson, 2004, 2011). These differentials indicate that some firms are better at capitalizing on their resources, including HCR (Syverson, 2004, 2011)<sup>9</sup>, and that differences in management quality produce the TFP differentials, mirroring the managerial dilemmas arising from complexity (Bertrand & Schoar, 2003; Bloom, Genakos, Sadun, & van Reenen, 2012; Bloom, Kretschmer, & van Reenen, 2011; Bloom, Lemos, Sadun, Scur, & van Reenen, 2014; Bloom & van Reenen, 2007).

Generally, there is agreement that management is important for creating value and achieving competitive advantage (Adner & Helfat, 2003; Castanias & Helfat, 1991). Dynamic extensions of the resource-based view of the firm—such as asset orchestration (Helfat & Peteraf, 2015), resource management (Sirmon et al., 2007), and resource orchestration (Chadwick, Super, & Kwon, 2015; Sirmon et al., 2011)—indicate that how firms use their resources is at least as important as the nature of the resources (Hansen, Perry, & Reese, 2004; Mahoney, 1995). Thus, matching, or talent management, becomes

<sup>8</sup> Syverson (2011) illustrates the TFP concept as follows:  $Y_t = TFP_t \cdot (K_t^{\alpha_k} \cdot L_t^{\alpha_l} \cdot M_t^{\alpha_m})$ , with  $Y_t$  as the output of firm  $t$ ,  $TFP_t$  as a firm’s total factor productivity, and a Cobb–Douglas production function linking observable inputs capital  $K_t$ , labor  $L_t$ , and intermediate materials  $M_t$ . In this, TFP is a residual and a potentially large multiplier to the organization’s observable inputs, including the firm’s HCRs ( $L_t$ ). In empirical settings, one can take logs and estimate  $\ln Y_t = \alpha_0 + \alpha_k \ln K_t + \alpha_l \ln L_t + \alpha_m \ln M_t + \epsilon_t$ . An estimate of TFP is  $\hat{\alpha}_0 + \hat{\epsilon}_t$ , where the first part is a sample average and the second part is an organization’s idiosyncratic (firm-fixed) productivity effect.

<sup>9</sup> Several approaches can be used to estimate the firm performance effects of management. Based on U.S. census data, Syverson (2004, 2011) estimates that a plant at the 90th percentile of the productivity distribution is 1.92 times as productive as an otherwise identical plant (as measured by observable inputs, including labor expenses) at the 10th percentile of the distribution. Relatedly, the strategic HR literature debates the strength of the HR–firm performance relationship. Some argue that the strategic HR literature reports too large and noncredible effect sizes (Gerhart, 2007b). If we accept Syverson’s (2011) estimate of 1.92 as an upper limit of the management–firm productivity relationship, future research might use that approach to partial out more specific management effects, such as HR–firm performance effects.

a dynamic managerial capability, indicating whether a firm can dynamically create, develop, reconfigure, and terminate matches to address external and internal volatility (Chadwick & Dabu, 2009; Teece, Pisano, & Shuen, 1997).

## FUTURE RESEARCH OPPORTUNITIES

### Match Complexity and Match Instability

Matching assumes that people and situations are heterogeneous. Moreover, matches are more or less complex. For instance, some firms simply value skills. Others value skills and attitudes, but weight skills more strongly than attitudes; again others prioritize cultural experience over skills, attitudes, and specific knowledge. As complexity increases, matches are more likely to become unstable and volatile because any of the underlying match dimensions may be subject to change. Furthermore, overall match quality may be more or less sensitive to specific dimensions (Seong & Kristof-Brown, 2012). For example, an employee may match well with job requirements but not with the firm, supervisor, industry, or country. Hence, low match quality on any dimension may undermine overall match quality, hindering productivity, retention, and organizational outcomes. Our dynamic matching lifecycle model recognizes that multiple KSAOs play essential roles in matching and that volatility and instability challenge matches. Extant matching research has yet to completely embrace these ideas.

### Matching Systems and Internal Fit

Our model recognizes that matching stages and activities are interdependent, which resonates with the strategic HR view that systematic combinations of HR practices and processes are better than single HR practices (Chadwick, 2010; Delery & Doty, 1996). Our systems perspective of matching suggests that firms should balance investments across the four matching stages. For example, a law firm that views associates as potential future partners should establish initial high-quality matches during the creation stage. Alternatively, the firm might spend resources to ensure that employees acquire firm-specific knowledge during the development and reconfiguration stages. Complementarities and substitutions logic provides a way to frame these interdependencies.

Activities are complementary when they increase or at least not decrease marginal profitability of other activities (Milgrom & Roberts, 1992; 1995). For example, selection and training are complements when

organizations screen applicants intensively for positions that will require significant training investments (Barron, Black, & Loewenstein, 1989). Other examples of complementarities include training that prepares employees for promotions, or carefully designed socialization programs that build on extensive selection efforts. In these cases, joint investments in more than one matching activity are more effective than isolated investments in the single activities.

Matching activities may also substitute for other activities. For example, internal and external hiring can substitute for one another (Bidwell, 2011; Bidwell & Keller, 2014). A second example relates to selection, training, and terminations. Low-quality matches are likely when selection is uncertain. Organizations may terminate low-quality matches, but if they engage in frequent terminations, they will lack incentives to invest in early training (Acemoglu & Pischke, 1998; Chang & Wang, 1995). Thus, terminations may be complementary to selection efforts. However, they may also substitute for training when higher churn rates, rather than training, lead to improved average match quality. More research is needed to consider the systems perspective.

### Talent Agents and Matching Information

Our dynamic matching lifecycle model suggests that the process of creating and maintaining good matches creates value. All relevant agents need information if they are to optimize matching, but we lack research showing how and where such information is generated, stored, and processed. HR departments must collect and disperse such information, but they need others such as frontline managers, employees, and peers to do so (Chadwick et al., 2015; Sirmon et al., 2011). For example, performance management records track employee qualifications and achievements. Concurrently, firm requirements must also be tracked, so that the two perspectives can be combined into strategic workforce planning initiatives (Becker & Huselid, 2006; Cappelli, 2008). Centralized HR managers can use such information to identify firm opportunities and needs and to create more macro-level firm outlooks, whereas many frontline managers focus on their group rather than company strategy.

Nevertheless, frontline managers also gather and disseminate relevant matching information and are often better than central HR departments for recognizing where relevant human capital resides. They also help employees focus on desired tasks and changing situations, requiring constant tracking of

employee and firm requirements. Thus, proximal rather than distal observers will often have better matching information. However, frontline managers may want to hoard their talent or use information selectively for personal goals rather than for creating organizational value.

In addition, employees can also identify high-quality matches. Only they know their willingness to try different tasks, jobs, and locations. Employees who are unwilling to take risks by changing positions may make matching more difficult. Consequently, a combination of a central HR department, frontline managers, employees, peers, and a company's ability to coordinate all of these "talent agents" influences the matching process. More research is also needed to identify how multi-business firms engage in matching across units, and how diverse agents reflecting different units and functions affect matching outcomes. Such research should further consider the critical role of leadership for matching outcomes and strategy implementation (Weller, Süß, Evanschitzky, & von Wangenheim, *in press*), thus recognizing the need to reconsider the HR/leadership interface (Ulrich, 1997), and better integrate strategic HR, HCR, and leadership literatures (Waldman, de Luque, & Wang, 2012).

### External Fit and Structural Design

Along with recognizing the importance of internal alignment, matching systems must also be in sync with the broader organizational structure and environment. Our review and resulting model make it clear that matching stages and activities should be considered in combination. Furthermore, the quality of information also affects match quality, such that talent agents are critical. However, our review indicates that relevant matching literatures have mostly ignored how organization design shapes the distribution of information (Rosen, 1982).

Organizations are complex and highly interdependent systems of coordinated activities (Simon, 1945; Thompson, 1967; Tushman & Nadler, 1978; March & Simon, 1958; Van de Ven, Ganco, & Hinings, 2013) that must make complex design choices to coordinate management systems and resources. When matching outcomes rely on available information, one relevant design parameter is centralization (Burton & Obel, 1984; Mintzberg, 1979; Van de Ven, 1976). In centrally governed organizations, decisions are made at headquarters or at the top of the hierarchy (Menz, Kunisch, & Collis, 2015). In decentralized organizations, decisions are delegated to field units and lower level roles. A second

design parameter is formalization (Mintzberg, 1979; Van de Ven, 1976), which describes the degree to which behaviors are constrained by processes, formal rules, and routines that serve as organizational (depersonalized) knowledge repositories (Grant, 1996; Nelson & Winter, 1982). Formalization gains are often associated with economies of scale and scope, such that small- and medium-sized organizations are often less formalized than larger organizations (Chadwick, Way, Kerr, & Thacker, 2013; Kaufman, 2010).

A two-by-two matrix of these design parameters provides a starting point for theorizing about the role of external alignment in the matching process (Figure 2). Although we cannot lay out a complete theory of structural design and matching, we hope that the simplified presentation motivates future research on the relationship between design and matching.

Some matching systems are designed to operate in a centrally governed and strongly formalized organizational system, a quadrant we call “traditional internal labor markets” (Quadrant 1). One matching activity fitting this quadrant is talent pools (Nyberg, Weller, & Abdulsalam, 2016), which create flexibility (Berk & Kaše, 2010; Bhattacharya & Wright, 2005; Cappelli, 2008) and human capital stocks for uncertain future labor demands in specific job clusters (Becker & Huselid, 2006). These clusters emerge from a strategic planning activity at the top of the firm. In turn, a talent pool embraces multiple, formalized matching activities, such as selective recruitment, training, and internal labor markets, and is thus a complex matching practice.

An alternative design is a centrally governed and weakly formalized organizational system—a quadrant we term “talent network” (Quadrant 2). Here, centrally initiated but informally executed processes govern matching activities (Krackhardt & Hanson, 1993; McEvily, Soda, & Tortoriello, 2014). Organizations may, for example, use referrals to fill positions (Granovetter, 1995; Pieper, 2015). Talent networks may also encourage former employees to stay connected, for instance, via alumni practices (Carnahan & Somaya, 2015).

In decentralized and strongly formalized organizations, a quadrant we call “local optimizers” (Quadrant 3), decision authority is delegated to agents in the business unit or in the line. Such systems often have a profit center structure because local optimizers are responsible for their revenues and costs. In these situations, human capital needs are identified where they occur, so local challenges may easily arise, but each local unit may also be more flexible. However, the localized nature of these

matching situations may make it more difficult to compare and evaluate them across the larger organization.

Finally, in decentralized and weakly formalized organizations, a quadrant we call “talent adhocracy” (Quadrant 4), local operators such as frontline managers will have the greatest autonomy over matching decisions. Talent hoarding (Lublin, 2017) may occur when opportunistic talent agents use their power egoistically. However, when organizational stewards (Davis, Schoorman, & Donaldson, 1997) can make autonomous matching decisions, such systems may be disproportionately successful.

Although the four quadrants are a preliminary suggestion, we advance matching research by combining a strategic organization design view with a management system view (Puranam, Raveendran, & Knudsen, 2012; Raveendran, Puranam, & Warglien, 2016). We encourage researchers to investigate the relative effects of the configurations.

### From Individual Human Capital to HCRs

Our review also indicates that organizations optimize their entire HCR through matching (Nyberg & Wright, 2015; Snell, Shadur, & Wright, 2002; Wright & Snell, 1998). HCR approaches suggest additional matching concerns. For instance, organizations must consider costs that accompany matching. For example, filling vacancies from within creates other vacancies, or vacancy chains, that require time and effort to fill. Larger organizations may find coordinating across openings and departments more cumbersome and costly than simply searching in the external market. In addition, even if individuals benefit from internal mobility, reconfiguring an organization’s HCR creates social costs. For example, team members must train and socialize newcomers (Call, Nyberg, Ployhart, & Weekley, 2015; Mühlemann & Strupler-Leiser, 2018), and internal mobility disrupts work flows (Reilly et al., 2014). However, such changes may create better networking and communication opportunities throughout the firm.

Thus, organizations should continually examine trade-offs between the focus on acquiring the best overall matches for local, specific employees versus all employees. Although we highlight the value of high-quality individual matches, it is possible that a series of low-quality matches could yield higher total organizational performance if the firm has overqualified employees or human capital slack (Maltarich, Reilly, & Nyberg, 2011). In such

a situation, placing high-quality human capital in poor matches, but in more valuable jobs (e.g., jobs with a larger scale of operations) where their efforts might result in higher organizational performance, even if that means also placing other employees in suboptimal matches. Furthermore, depending on incremental performance improvements associated with match improvements, costs associated with transitioning an employee to a higher quality match may outweigh possible benefits, meaning that there may be times when keeping employees in low match quality jobs could be more beneficial for the organization than moving the employee to jobs where the match quality is higher. Future research should further explore these ideas.

### Matching and the Nature of Work

Most of the matching-related research cited in our review focuses on full-time employment situations. However, the full-time model may no longer be valid for much of the economy (Cappelli, 1999). Although “textbook accounts of important workplace management topics [...] are based on the full-time employment model and the unique relationship that employers have with employees” (Cappelli & Keller, 2013: p. 575), 20 percent of U.S. workers maintain nonstandard employment such as independent contracting and temporary help. New forms of work may seriously challenge matching assumptions.

At the extreme “uberization” of work (Fleming, 2017), spot contracts between firms and independent contractors replace employment relationships. As responsibilities and roles change in the new work economy, platforms such as Upwork and Amazon’s Mechanical Turk can digitalize search and selection, with the automatic support of deep learning algorithms. In the “gig economy” (Brawley, 2017; Kuhn, 2016), firms do not train and retain employees, and internal labor markets are virtually nonexistent. Rather, firms delegate much of their employer responsibilities to individuals acting as independent contractors who plan and shape their careers independently and autonomously. For instance, some individuals have boundaryless careers in which they frequently and actively change jobs (DeFillippi & Arthur, 1994; Sullivan, 1999; Sullivan & Arthur, 2006), or they may work for firms that provide early career training and then move to firms that compensate for those skills (Bidwell & Briscoe, 2010). More research is needed to understand how the dynamic matching lifecycle fits into such environments.

### CONCLUSION

Our cross disciplinary review and assessment of the current matching literature clarifies that matching is an essential human resource and talent management mechanism for transforming human capital into economic value. Our integrative approach provides a systematic foundation for researchers across disciplines to approach matching from many paths.

We develop a dynamic matching lifecycle model to provide a comprehensive perspective on matching. Our model recognizes that matching involves changes to both *persons* and *situations*. We extend the ASA model to include adaptive matching processes that change persons and/or situations in four stages: creation, development, reconfiguration, and termination. We conclude that matches are inherently volatile and can be challenged by exogenous and/or endogenous forces at each stage. Our middle-range theory of matching contributes to the emerging strategic HCR field and helps spur future research.

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