Retraction Notice

The following articles have been retracted by the Editor and publishers of *Journal of Management*:

DeGeest, D. S., Follmer, E. H., Walter, S. L., & O’Boyle, E. H. 2017. The benefits of benefits: A dynamic approach to motivation-enhancing human resource practices and entrepreneurial survival. *Journal of Management*, 43: 2303-2332.

DeGeest, D. S., Follmer, E. H., & Lanivich, S. E. In press. Timing matters: When high-performance work practices enable new venture growth and productivity. *Journal of Management*. [Epub ahead of print June 6, 2016.](https://doi.org/10.1177/0149206316652481)

After the initiation of an investigation into concerns about the reporting of results, the articles have been retracted as the result of information provided by corresponding author David S. DeGeest, who informed the journal that he incorrectly reported the results of the data analysis completed by him. Specifically, DeGeest notified the journal that many of the parameter estimates and significance tests he reported in the papers are false.

DeGeest emphasized to the journal that he acted alone without the knowledge of co-authors.
RETRACTED: Timing Matters: When High-Performance Work Practices Enable New Venture Growth and Productivity

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An urgent issue for new ventures is how firms can effectively use human resource policies to promote growth and employee productivity. In this study, we propose a model of how three motivation-enhancing human resource (MHR) practices relate to firms’ subsequent growth and productivity. In addition, we demonstrate how two temporal factors influence the relationship of MHR practices with subsequent growth and productivity. Specifically, we assess how the initial implementation of MHR practices creates short-term costs and long-term benefits, and we assess how firm developmental stage influences the relationship of MHR practices with subsequent growth and productivity. We test our model by using random coefficient growth modeling with a sample of 677 firms tracked for 6 years. We found that MHR practices are related to subsequent firm growth and productivity. In addition, we show that the initial use of MHR practices creates inefficiencies that, in the short-term, slow growth and productivity but have positive long-term effects of subsequent growth and productivity. Finally, we show that the relationships of MHR practices with growth and productivity are much stronger when firms are in a post-revenue, growth goal stage. We conclude with a research agenda and recommendations for how new ventures can make effective use of MHR practices to promote performance.

Keywords: entrepreneurship; strategic HRM; organizational life cycle; multilevel model

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Growth and productivity are priorities for most new ventures (Acs & Mueller, 2008; Criscuolo, Gal, & Menon, 2014), yet uncertainty exists regarding when and how these firms can best accomplish these goals. One way firms can facilitate growth and productivity is through resource investments in human resource (HR) practices designed to influence employee acquisition, retention, and motivation (Gardner, Wright, & Moynihan, 2011; Welbourne & Andrews, 1996). The deployment of such practices represents a strategic outlay of a venture’s resources toward goal achievement via human capital recruitment, retention, and activation (Lepak & Snell, 1998). Identifying factors that determine when and how these investments are successful remains a key goal of research on strategic HR management (HRM) and entrepreneurship (Jackson, Schuler, & Jiang, 2014; Marvel, Davis, & Sproull, 2016; Nyberg & Wright, 2015). Prior research has established two theoretical perspectives that speak to the relationships between time, HR investments, and firm performance: the resource-based view of the firm (RBV; Boxall, 1996; Wright, Dunford, & Snell, 2001) and general systems theory (e.g., Delany & Huselid, 1996; Sonnenfeld & Peiperl, 1988). These frameworks converge across several points, including that HR practices are most strongly related to operational performance measures, such as firm growth and employee productivity (Batt & Colvin, 2011; McClean & Collins, 2011), and that firms use bundles of HR practices aligned with their strategy, organizational structure, and values (Gerhart, 2007; Subramony, 2009; Toh, Morgeson, & Campion, 2008). In the context of new ventures, where resources are constrained, dynamism is rife, and growth is critical, HR practices must do two things: They must create alignment between the employees’ and organization’s goals as well as enhance employees’ capacity to pursue those goals (Messersmith & Guthrie, 2010; Rauch, Frese, & Utsch, 2005). In this study, we focus on motivation-enhancing HR practices (MHR), defined as HR practices that encourage positive motivation and perceptions of mutual investment between the firm and the employee (Gardner et al.).

Despite these agreements and significant advances in understanding the relationship between HR practices and firm outcomes (Jackson et al., 2014), strategic HR research has called for more in-depth analysis of how the relationship between HR investments and operational performance unfolds over time (Becker & Huselid, 2006; Gerhart, Wright, & McMahan, 2000; Guest, 2011; Jiang, Lepak, Hu, & Baer, 2012; Wright, Gardner, Moynihan, & Allen, 2005). Studies from both theoretical perspectives highlight several issues. One issue involves how the timing of HR investments determines whether firms are able to leverage their human capital resources effectively (Wright & Haggerty, 2005) and the delay between initial investments in HR and observable effects on unit outcomes (Wright et al., 2001; Wright et al., 2005). Another issue is that HR investments are part of an adaptive response managers use to facilitate growth and productivity as their organization develops more complex needs to manage employees (Allen & Wright, 2007; Pfeffer, 1995; Shin & Konrad, in press). However, the utility of these practices depends on contextual factors, such as the environment and the organization’s goals (Chadwick, Way, Kerr, & Thacker, 2013; Datta, Guthrie, & Wright, 2005; Gerhart, 2007).

The purpose of this study is to integrate these theoretical perspectives in order to develop a model of how temporal factors influence the degree to which MHR practices facilitate growth and productivity in new firms. In doing so, this study contributes to the literature in multiple ways. First, this study contributes to the strategic HRM literature by demonstrating that the relationship between HR practices and firm outcomes may emerge only after sufficient time has passed for the benefits of the investment to affect firm-level outcomes (Jackson
et al., 2014). Second, this study contributes to the burgeoning literature on strategic human capital by highlighting how the strategic trade-offs inherent in the initial investments of resources in HRM activities unfold over time (Wright, Coff, & Moliterno, 2014). These trade-offs require new ventures to invest in HR practices at the optimal stage of firm development so that they do not devote scarce resources to these investments before the venture will benefit from their use. By investigating the distinction between premature and optimally timed investment in MHR, we provide guidance for new ventures regarding when to invest in these practices. Third, this study contributes to the entrepreneurship literature by delineating how the management of human capital can affect growth and productivity in new ventures (Marvel et al., 2016). By identifying HR investments as facilitating mechanisms through which managers can spur growth and productivity in their new ventures, we clarify when such investments affect the operational outcomes of entrepreneurial firms. Because new ventures are chimeric, changing entities, elucidating how the relationship between HR practices and firm outcomes changes over time is critical to investigations of the strategic value of HRM (Chuang, Jackson, & Jiang, 2016).

We draw from the RBV to model how two temporal factors—initial adoption and firm developmental stage—influence the degree to which managerial decisions to invest in MHR facilitate or hinder firm growth and productivity (Colbert, 2004; Nyberg, Moliterno, Hale, & Lepak, 2014; Ployhart & Moliterno, 2011; Wright et al., 2001). In our model (see Figure 1), MHR practices have relationships with subsequent firm growth and productivity that depend on specific factors of the implementation of these practices related to the timing of the initial adoption of these practices as well as the developmental stage of the venture.

**Literature Review and Hypothesis Development**

**Defining MHR Practices**

In the logic of the RBV, HR practices can configure a firm toward the acquisition, retention, and mobilization of human capital resources (Lado & Wilson, 1994). MHR practices differ from more generic sets of HR practices (e.g., benefits, paid vacation) because scholars argue that they influence employees’ actions by aligning their goals with those of the organization and also by enhancing the employees’ capacity to pursue those goals (Appelbaum, Bailey, Berg, & Kalleberg, 2000; Gardner et al., 2011; Huselid, 1995; Subramony, 2009; Wright & Snell, 1998). MHR practices also conceptually differ from high-performance work systems (HPWSs) in that HPWSs focus on a broader and more heterogeneous set of HR practices that can also include skill-enhancing practices designed to increase the knowledge, skills, and abilities of a workforce via training or selection (Jiang et al., 2012). Past research on how MHR practices influence behavior suggests that they function via signaling effects associated with social exchange (Blau, 1964; Gardner et al.). MHR practices signal an organization’s investment and trust in its employees and thereby foster a psychological perception of mutual employer-employee investment (Kehoe & Wright, 2013; Tsui, Pearce, Porter, & Tripoli, 1997; Whitener, 2001). This perception of mutual investment contributes to a norm of reciprocity between the individual and the organization that motivates individuals to pursue actions aligned with the organization’s needs and also enables them with the discretionary ability to do so as part of their exchange with the organization (Eisenberger, Fasolo,
Despite significant research on the value of MHR practices in general, the exact number and structure of MHR practices used varies substantially across firms, industries, and contexts (Gardner et al., 2011; Kehoe & Wright, 2013; Ulrich, 1997). Many different typologies exist because no single practice or set of practices has universal utility: The efficacy of such practices varies on the basis of the specific strategic needs of businesses in different environments (Gerhart, 2007; Wright & Brewster, 2003). Because of this contextual specificity, we follow recommendations in the literature (e.g., Appelbaum et al., 2000; Batt, 2002; Batt & Colvin, 2011; Gerhart; Shaw, Dinlen, Fang, & Vellella, 2009) and focus on a subset of MHR practices relevant to the entrepreneurial context. In this study, the practices we focus on are bonus programs (e.g., Chung & Vickery, 1976; Lee, 1988), employee stock options (e.g., Chingos & Engel, 1998; Gonzalez-Mulé & O’Boyle, in press; Lawler, Mohrman, & Ledford, 1995), and flex-time programs (e.g., Baltes, Briggs, Huff, Wright, & Neuman, 1999; Combs, Liu, Hall, & Ketchen, 2006).

The Relationship of MHR With Firm Growth and Employee Productivity

MHR practices accomplish employee goal alignment and enhancement through two related avenues. First, MHR practices induce goal alignment by implementing incentive programs,
such as stock options and bonuses that reward individual performance that furthers organizational goals (Jiang et al., 2012; Lepak, Liao, Chung, & Harden, 2006). Second, MHR practices enhance employees’ ability to achieve these goals by implementing work arrangements, such as flex-time programs, that increase employees’ discretionary range of action to pursue these aligned goals (Gerhart, 2007; Whitener, 2001). This goal alignment and enhancement induces employee cognition and behaviors that, in the aggregate, can facilitate firm growth and productivity.

We first address the way in which the use of MHR practices should be associated with firm growth. Drawing from the logic of Gerhart’s (2007) model of fit, we argue that the alignment and enhancement produced via stock options, bonus programs, and flex-time programs facilitates firm growth by fostering a relationship between the organization and its employees that encourages attraction and retention of key employees. Specifically, the alignment of goals and the increased capacity to pursue them stimulates employees’ cognitions of involvement with the organization and increases their interest in the organization’s success (Freeman, Blasi, & Kruse, 2010). In turn, these cognitions fuel investment and identification with the firm, increasing employee attraction and retention (Batt & Colvin, 2011; Gardner et al., 2011; Gong, Law, Chang, & Xin, 2009; Shaw et al., 2009; Subramony, 2009). Research has shown that such HR investments can fuel not only retention but also attraction of employees, particularly in small and emergent organizations (Mayson & Barrett, 2006; Nguyen & Bryant, 2004). Past studies have also demonstrated entrepreneurial companies use both incentive programs and more flexible work practices specifically to retain or draw in key organizational experts, incentivize commitment, and facilitate positive exchange behaviors among employees (Jack, Hyman, & Osborne, 2006). With respect to stock options and bonuses, employees perceive they will capture additional value by joining or staying with organizations that have invested in them (J. N. Baron & Hannan, 2002; Hand, 2008). In the case of flex-time programs, entrepreneurial companies use these practices to create a more attractive working environment for employees, to implicitly demonstrate their trust that employees can complete the task assigned, and to increase employee discretion about how to complete goals (Maxwell, Rankin, Bell, & MacVicar, 2007). Therefore, we hypothesize:

**Hypothesis 1:** MHR use in the form of (a) stock options, (b) bonus programs, and (c) flex-time programs are positively related to subsequent firm growth.

The use of MHR practices should also be positively related to increases in employee productivity over time because in addition to enabling firms to attract and retain key employees, the alignment and enhancement these practices induce also configure a firm’s human capital toward high performance by leveraging the talents and skills of individual employees into firm-level organizational capabilities (Collins & Smith, 2006; Patel, Messersmith, & Lepak, 2013; Sirmon, Hitt, Ireland, & Gilbert, 2011; Wright et al., 2001). In the context of new ventures, alignment and enhancement induced by MHR practices facilitate productivity because they augment exchange and collaboration processes among employees (Kehoe & Collins, 2008). For example, firms can structure bonus and stock option programs to incentivize employees’ support for each other’s efforts, facilitating both employee and organizational investment in cooperation and its consequent boons to employee productivity (Collins & Smith; Datta et al., 2005; Gelade & Ivery, 2003; Huselid, 1995). Similarly, flex-time
programs can provide structures that facilitate collaboration among employees (Batt & Valcour, 2003; Muse & Wadsworth, 2012). Flex-time programs also increase the ability of employee members to engage in discretionary actions to complete their work, which facilitates employee collaboration and productivity in the uncertain, dynamic environment of a new venture (J. N. Baron & Hannan, 2002). Finally, the use of flex-time programs stimulate employee cognitions related to mutual welfare, which foster increased collaborative effort and enhanced employee productivity (Iverson & Zatzick, 2011; Kossek & Michel, 2010; Nadler, Cundiff, Lowery, & Jackson, 2010). Therefore, we hypothesize:

**Hypothesis 2:** MHR use in the form of (a) stock options, (b) bonus programs, and (c) flex-time programs are positively related to subsequent firm productivity.

**Short-Term Costs and Long-Term Benefits of MHR Practice Adoption**

Leaders of new ventures make decisions about HRs and human capital as part of an adaptive response process to changing environmental cues (Sonnenfeld & Peiperl, 1988), and managerial decisions about resource investments play a central role. New ventures are designed to grow, change, and adapt over time, and the use of more sophisticated HR practices can facilitate future growth as part of this adaptation (Kepes, Delery, & Gupta, 2008). As firms show the potential for significant growth, managers may choose to invest resources in HR practices because they believe these practices will facilitate the future growth and productivity of the firm (Gerhart et al., 2000; Wright et al., 2005). However, there are multiple issues associated with implementation, including both the cost of initial adoption and the developmental goals of the new firm. To further develop these ideas, we draw from the RBV and general systems theory to highlight two key issues in the literature regarding HR investments and human capital: (a) the trade-off between the short-term costs and long-term benefits of HR adoption and (b) the developmental stage and goals of a new organization.

The first issue we highlight relates to the length of time before benefits emerge from HR investments (Wright et al., 2001). Some research suggests that although HR practices allow firms to leverage their human capital, the initial implementation of any HR practice requires resource investments that lead to dynamic adjustment costs, or short-term internal inefficiencies as the organization restructures and adapts (Dierickx & Cool, 1989; Penrose, 1959/1995). Therefore, HR adoption, or the initial time period when firms first begin to use these practices, can lead to short-term null or negative effects on growth and productivity as firms adapt their resources to a new use (Kor & Mahoney, 2000). Drawing from the RBV and general systems theory, we identify how HR adoption shapes subsequent firm growth and productivity on the basis of these initial, short-term costs and the potential for long-term, positive change in postadoption growth and productivity over time. Managers that opt to use MHR practices must consider that doing so requires an outlay of organizational resources that influences how the benefits of MHR practices manifest. Past research has described a four-part enactment process that includes introducing the concept of HR practices to key decision makers, customizing HR practices to fit them into the idiosyncratic context of the organization, consultation with stakeholders, and implementation by line managers (Guest & Bos-Nehles, 2013). In general, this enactment process consumes substantial firm cognitive and physical resources, which can delay the emergence of benefits. In the logic of the RBV, this delay between the initial adoption of MHR practices and when they begin to first benefit firm
growth and productivity leads to short-term inefficiencies in a firm’s use of its human capital (Colbert, 2004; Wright et al.). Some studies suggest that this delay between the adoption of HR practices and their effect on performance contributes to the inimitability of these practices as a form of competitive advantage (Wright & Haggerty, 2005); we note that delay also implies the benefits of MHR adoption emerge only over time. In this study, we focus on two components of change as a firm first adopts MHR practices: (a) the negative effects of initial adoption on firm productivity and growth and (b) the positive effects on postadoption slope, or how the slope of productivity and firm growth changes after implementing MHR practices.

When firms initially adopt MHR practices, organizations have to invest time, attention, and resources in implementation activities. These types of activities include determining the specific customization of MHR practices (e.g., how managers choose to phase in or sequence the adoption of different practices), how managers can best leverage their existing resources to overcome specific implementation challenges, and how managers can integrate new practices with extant organizational standards and norms (Guest & Bos-Nehles, 2013). As firms invest resources in MHR adoption to facilitate growth and productivity, they must reconfigure other components of their organization as well. Such adaptive changes in structure disrupt the venture’s current status quo, temporarily reducing its ability to extract value from its existing resources (Latham & Braun, 2009; Ployhart & Moliterno, 2011). This reduction should cause a temporary dip in growth and productivity of the firm as managers attempt to integrate the new practices into their systems and increase the adaptive fit and alignment of the MHR practices to the venture’s idiosyncratic needs. Therefore, we hypothesize:

**Hypothesis 3:** The first-time adoption of MHR practices will have a negative short-term effect on (a) firm growth and (b) firm productivity.

Although the initial adoption of MHR practices may have short-term negative effects on growth and productivity, they also reconfigure the human capital of the organization into a form that has great potential to facilitate future growth and productivity over time (Lado & Wilson, 1994). In general, firms eventually overcome the initial challenges of implementation and match MHR practices to the firm’s unique needs and context. As this transition occurs, the MHR practices that the venture has adopted should begin to function as expected and facilitate the growth and productivity of the firm. Specifically, we expect to see that the postadoption slopes of growth and productivity are greater than the preadoption slopes. This increase should occur because the adoption of MHR practices enables the firm to adaptively shift the organization’s allocation of resources to meet its needs for attracting, retaining, and motivating its key employees (Shin & Konrad, in press). Therefore, we hypothesize:

**Hypothesis 4:** There will be a positive postadoption slope for (a) firm growth and (b) firm productivity that is greater than the preadoption slope.

**Firm Stage, Viability Goals, and Growth Goals**

New ventures change dramatically over short periods of time. The environmental dynamism and shifting goals of new ventures contribute to a context where implementation of HR practices depends on how well the practices meet organizational needs. Implementing HR
practices when firms are too new to take full advantage of their benefits can diminish their positive effects on subsequent growth and productivity. Using stage theory of entrepreneurship (Delmar & Shane, 2004; Zahra, Sapienza, & Davidsson, 2006), we identify how a firm’s stage of development moderates the relationship of HR usage and adoption with subsequent growth and productivity. Specifically, we propose that firms in an early, viability goal stage of development are less likely to experience positive changes in growth and productivity from the use and adoption of HR practices compared to firms that have established viability and instead seek to grow and increase their capacity. Although MHR practices, in general, facilitate survival and growth in new ventures (He, 2008; Welbourne & Andrews, 1996), the value of these practices depends on firms developmental goals. According to Gerhart’s (2007) model of the strategic fit of HR practices, firms must align HR practices to coincide with organizational contexts and needs. In a new venture, firm developmental stage influences this context, and premature implementation of HR practices can consume scarce resources needed elsewhere. More recent research on HR practices emphasizes that organizational goals and industry context influence the degree to which HR practices incur costs and garner benefits (Chadwick et al., 2013; Chadwick, Super, & Kwon, 2014).

In the context of new ventures, the developmental stage of a firm influences the costs and benefits of HR practices because different organizational goals and needs take priority at different developmental stages (Zahra et al., 2006). If managers choose to adopt HR practices misaligned with firm needs and goals, they decrease their firm’s capacity to leverage its resources, reducing its fit with its environment (Gerhart, 2007) and mitigating the facilitating benefits of HR practices. Research on stage models of entrepreneurship stresses that firm goals and priorities shift through two stages in the first several years after firm formation (Delmar & Shane, 2004). Specifically, firms at their inception are in a viability goal stage, where goals emphasize market identification, developing external legitimacy, and acquiring financial support (Jawahar & McLaughlin, 2001; Miller & Friesen, 1984; Webb, Tihanyi, Ireland, & Sirmon, 2009). Though the duration varies, all firms in the viability goal stage of development will experience a period of prerevenue as they acquire and develop the necessary resources to bring their product or service to market and generate sales (Payne, 2007). Firms that meet the initial challenges of viability then move into a postrevenue growth goal stage, where increasing size, productivity, and capacity become paramount objectives (Gilbert, McDougall, & Audretsch, 2006; Lumpkin & Dess, 2001; Sirmon et al., 2011). Firms that pursue actions aligned with their developmental goals typically observe positive performance; firms that pursue misaligned organizational practices observe null or even negative effects, including diminished productivity, slower growth, and even firm dissolution (Delmar & Shane).

In the viability goal stage, MHR practices offer little value to firms because they do not help organizations to meet goals related to viability (Jawahar & McLaughlin, 2001; Rutherford, Buller, & McMullen, 2003; Zahra, Filatotchev, & Wright, 2009). Devoting firm resources to MHR practices draws resources away from activities that could foster increases in growth and productivity, such as acquisition of capital resources, procurement of intellectual property, or market development (Kazanjian, 1988). In other words, the use of firms’ limited resources in the development and implementation of HR practices, which are focused on the alignment and enhancement of organizational and employee goals, reduces firms’ capacity to pursue viability goals, creating misfit between their viability goals and their...
resource allocation. In the growth goal stage, MHR practices are valuable to organizational goals because they induce goal alignment and enhancement, which enable firms to meet goals related to growth and increased productivity (Gilbert et al., 2006; Lumpkin & Dess, 2001; Rutherford et al.; Sirmon et al., 2011). Therefore, we expect to observe that when firms are new and in a viability goal stage, MHR practices will have a weak relationship with firm growth and employee productivity. In contrast, when firms are in a growth goal stage, MHR practices will have a stronger, positive relationship with firm size and employee productivity because of the benefits of alignment. Therefore, we hypothesize:

**Hypothesis 5:** The relationship of the post–MHR adoption (a) firm growth slope and (b) firm productivity slope depends on firm stage such that the postadoption slope is stronger if the firm is in the postrevenue growth goal stage.

The effects of firm stage will also directly affect the value of MHR practices on subsequent firm growth and productivity. Specifically, when firms are in a viability goal stage, the beneficial goal alignment and enhancement effects of MHR practices will be weaker because the goals that a new firm pursues are not specifically focused on increasing growth and employee productivity. This misfit weakens MHR effects on firm outcomes. In contrast, when firms are in the growth goal stage, the fit between MHR practices and the organizational goals is high, augmenting their effects on firm growth and productivity. Therefore, we hypothesize:

**Hypothesis 6:** Firm stage moderates the relationship between MHR usage and subsequent firm (a) growth and (b) productivity such that the relationship of MHR with firm growth and productivity is positive but weaker for firms in a viability goal stage than for firms in a growth goal stage.

**Method**

**Sample**

For our sample, we drew from the Kauffman Firm Survey (KFS) data from the period 2004 to 2010. The KFS data are a panel study of new ventures in the United States that began operations in 2004 (detailed information about the KFS can be found at http://www.dataenclave.org/index.php/kauffman). The survey collected data from 4,928 firms in 2004 and has followed those firms on an annual basis. Detailed information on the firm and up to 10 owners includes firm-level information, such as net income and number of employees. Information on the owners, such as gender, race, education, and work experience, is also included. We focused on firms in industries where knowledge production is important because growth in these types of firms’ production is tightly linked to the accrual and development of high-quality human capital (Anand, Gardner, & Morris, 2007). Thus, we selected two North American Industry Classification System codes: information (e.g., publishing, software, telecom; code = 51) and professional, scientific, and technical services (code = 54). We excluded firms that did not report necessary information on the study variables, firms that had zero employees, and firms in which the founding owners either left or added new members. Firms with ownership changes were excluded because such changes can influence strategic choices as well as firm performance (Klotz, Hmieleski, Bradley, & Busenitz, 2014), leading to
omitted variable errors (Mauro, 1990). To capture subsequent effects, we used a 1-year lag between our measurement of our independent measure (MHR practices) and our outcome dependent variables (firm growth and productivity). The final sample included 677 firms with 4,026 observations over 6 years.

**Measures**

**MHR practices.** From the selection of HR practices included in the KFS, we focused on practices that met the following criteria: (a) cited in past literature as practices that helped organizations attract and retain talent, (b) feasible for new ventures with limited resources, and (c) reasonable frequency of use in the KFS sample of organizations. Three HR practices met these criteria: the use of a flex-time program, the use of an employee stock option program, and the use of a bonus plan program. Owners were asked annually whether they offered these programs to their full-time employees. Answers were coded 0 for no or 1 for yes. Other HR practices were also measured in these data but were not included in our construct of MHR (see Appendix A in the online supplemental material). We did not include other items in our measure because of their low frequency in our sample (i.e., tuition reimbursement and retirement plans were used by less than 1% of firms in our sample) or because the constructs are not directly germane to the concepts of goal alignment and enablement (i.e., health-care plans, paid sick leave, paid vacation).

**MHR adoption event and postadoption slope.** In line with procedures outlined in discontinuous growth models (Lang & Bliese, 2009; Singer & Willett, 2003), we created an adoption event measure for each firm. We coded the event by assigning 0 to each firm for every year prior to the initial adoption of MHR practices and 1 for the 1st year when the firm began to use any of the MHR practices in our study and any subsequent years in the sample. The coding of these events is consistent with prior research on adaptation at the individual level (Lang & Bliese) and modeling of other types of events for firms, such as turnover (Hale, Ployhart, & Shepherd, in press). Also, the coding is consistent with the theoretical model and proposed empirical effects we are interested in observing. The postadoption slope for MHR adoption is coded by assigning 0 for every year prior to and including the initial adoption event. For all subsequent years, the value of the postadoption variable increases by 1 (e.g., 1, 2, 3, . . .). This variable captures the change in linear growth and productivity after the adoption event and is consistent with the discontinuous growth modeling approach used in Lang and Bliese and described in Singer and Willett. Table 1 provides examples of how this coding scheme was implemented in our data. We also tested our results to see whether there were effects for sequencing (e.g., whether firms first adopted flex time, then bonuses, then stock options or whether firms first adopted bonuses, then flex time, then stock options) and bunching (e.g., whether firms adopted all three practices simultaneously). Results showed no meaningful differences for these sequencing or bunching effects.

As an additional empirical support for this adoption event, we investigated the effects of a composite of the three practices for each time period. Reliability of this measure was moderate (Kuder–Richardson Formula 20 = .68), indicating that firms in this sample tended to use these HR practices together. In addition, we conducted an exploratory factor analysis of
the three items and found a single principal factor extracted explained 52% of the variance. These results provide some support for clustering these practices and assessing them as a group in terms of their initial adoption.

**Firm size and growth (employees).** In the sample, firms reported on the number of full-time employees for each year they completed the survey. This variable was measured every year, from Time 0 to Time 5. We measured firm growth as the change in the number of employees across each year. We excluded firms that used part-time employees and estimates of the number of these employees.

**Firm productivity (value-to-wages ratio).** To model employee productivity, we examine the relationship of MHR use with the ratio of total firm value to total expenses in labor (i.e., total amount of wages paid). This measure is convergent with more conventional measures, such as revenue per employee (Hamann, Schiemann, Bellora, & Guenther, 2013), and captures the degree to which a venture can increase its value relative to the costs of labor and human capital. Though this measure is less commonly used to evaluate employee productivity (e.g., Datta et al., 2005), it captures the degree to which a firm increases in value relative to the labor and human capital costs. This variable was measured every year, from Time 0 to Time 5.

**Prior performance.** To evaluate the prior performance of the firm, we used estimates of the firm’s growth and productivity from the Time 1 observation of the firm (i.e., the Year 1 value of growth and productivity of the firm for the adoption of MHR in Year 2).

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**Table 1**

**Example Coding and Interpretation of Change Variables**

| Interpretation of Parameter: Firm ID | Linear Firm Changes in Size and Productivity: Time | Time Period When Firms Begin Using MHR Practices: Adoption | Linear Firm Changes in Size and Productivity After MHR Adoption: Slope |
|-------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| A 0                                 | 0                                                 | 0                                                 | 0                                                 |
| A 1                                 | 1                                                 | 1                                                 | 0                                                 |
| A 2                                 | 1                                                 | 1                                                 | 1                                                 |
| A 3                                 | 1                                                 | 1                                                 | 2                                                 |
| A 4                                 | 1                                                 | 1                                                 | 3                                                 |
| A 5                                 | 1                                                 | 1                                                 | 4                                                 |
| B 0                                 | 0                                                 | 0                                                 | 0                                                 |
| B 1                                 | 0                                                 | 0                                                 | 0                                                 |
| B 2                                 | 0                                                 | 0                                                 | 0                                                 |
| B 3                                 | 1                                                 | 1                                                 | 0                                                 |
| B 4                                 | 1                                                 | 1                                                 | 1                                                 |
| B 5                                 | 1                                                 | 1                                                 | 2                                                 |

*Note:* The table depicts the univariate model of two firms with two different motivation-enhancing human resource (MHR) adoption strategies. Firm A began using MHR practices in Time 1. Firm B began using MHR practices in Time 3. Therefore, each firm differs both in its adoption of MHR practices and in the changes in size and productivity after the firm begins to use these practices.
**Firm goal stage.** To capture firm stage, we used the proxy of whether each firm in a given time period was prerevenue (had yet to begin generating revenue) or postrevenue (was generating revenue). This was coded as 0 for the prerevenue viability goal stage and as 1 for the postrevenue growth goal stage.

**Controls.** We controlled for the effects of race (operationalized as the percentage of individuals on the ownership team who are not White, measured at Time 0) and gender (operationalized as the percentage of individuals on the founding team who are female, measured at Time 0) because past research on entrepreneurship has shown that these variables are related to operational performance outcomes (Cooper, Gimeno-Gascon, & Woo, 1994; Klapper & Parker, 2011) and can influence decisions regarding human capital practices (Chadwick et al., 2015; Nyberg et al., 2014). Firms in the study came from North American Industry Classification System Codes 51 (information and cultural industries) and 54 (professional, scientific, and technical services); thus, we controlled for industry with dummy variables. In addition, to account for the ownership structure of the firm, we controlled for whether the firm used equity financing.

We controlled for several factors related to the founding teams in these studies. Because founding teams varied greatly in terms of their overall size, we controlled for the number of founders (measured at Time 1). We also controlled for founder knowledge and experience. To model founder knowledge and experience, we calculated the average educational level of the founding team (education), the average number of years the founding team had worked in the industry (industry experience), and the average number of businesses the founding team had previously started (venture experience). These are typical variables used to model knowledge and experience and are consistent with past literature (e.g., Unger, Rauch, Frese, & Rosenbusch, 2011). Finally, because we were concerned about the way in which firms are sensitive to initial conditions, we controlled for the Time 0 values of firm size and employee productivity to ensure that these initial configurations were not driving the observed results.

**Levels of Analysis and Analytic Strategy**

The data for our study are longitudinal and nested such that we observed multiple time-sequenced measures of the use of MHR practices, firm size, employee productivity, and performance for each firm in our sample. Therefore, we tested our hypotheses about the relationship of MHR with subsequent firm growth and productivity by using random coefficient growth modeling at the within-firm level (Bliese & Ployhart, 2002). In addition, because our model assumes a nonlinear, discontinuous effect for the adoption of MHR practices, we used discontinuous growth modeling to capture these effects (Lang & Bliese, 2009; Singer & Willett, 2003). Discontinuous random coefficient growth models are a specific subclass of random coefficient growth models that allows us to look at longitudinal change in outcomes before, during, and after an event occurs, such as initial MHR adoption. In our model, the independent variable is the time trend. Specifically, we use a model in which the repeatedly measured human capital criteria (i.e., firm size, employee productivity) was regressed on the control variables, the MHR variable, the time-based components (i.e., the adoption event and postadoption slope), and the interaction terms of the MHR variables and the time-based components with the firm stage variable. In this model, the dependent
variable is change in the human capital criteria, and the regression weights are estimates of whether the human capital variables change over time. Note that the regression weights represent the average for all firms included in the sample. The interfirm (Level 2) model uses the variance components to estimate between-firm heterogeneity among the intercept and slopes for the firms.

Because within-firm change over time is a necessary condition for our hypotheses, assessment of within-firm variation across time is important. We used random coefficient modeling (Bliese & Ployhart, 2002) to estimate one-way analysis of variance models for our Level 1 dependent variables: firm growth and firm productivity. The results indicated there was a substantial amount of within-firm variance for both firm growth and firm productivity, with intraclass correlation coefficient, or ICC(1), values of .62 and .52, respectively, substantiating our decision to use random coefficient growth modeling to test our hypotheses rather than treating within-firm variance over time as random error.

Results

Table 2 presents our correlation matrix. We note several features. First, we provide information about the different mean levels for MHR practices, the number of employees, and productivity in the overall sample as well as at Time 0 and Time 5. These results generally show that MHR practices, the number of employees, and productivity increased over time in a linear fashion and that the addition of a quadratic term did not significantly add to predictive power for the data analyzed. These results provide further support to the empirical analysis suggesting that the use of MHR practices, firm growth, and productivity all increase over time in this sample.

Bliese and Ployhart (2002) recommend analyzing error structures of outcomes over time, as well as assessing whether the ICC(1) is high enough to warrant meaningful between-firm variability and whether there is statistically significant variance in both slopes and intercepts for the outcome. Results for this analysis show that for firm growth, the ICC(1) is .62 and there is statistically significant variance in both slopes (log likelihood, LL, ratio = 38.04, \( p < .05 \)) and intercepts (LL ratio = 9,832.91, \( p < .05 \)), implying there is meaningful between-firm variance. Similarly, for firm productivity, the ICC(1) is .52 and there is statistically significant variance in both slopes (LL ratio = 2,861.23, \( p < .05 \)) and intercepts (LL ratio = 242.97, \( p < .05 \)), implying meaningful between-firm variance. These results suggest meaningful between-firm variance over time in our results. Further information about the error covariance structure is available via Appendix B in the online supplemental material.

Hypothesis 1 states that MHR use in the form of (a) stock option programs, (b) bonus programs, and (c) flex-time programs are positively related to subsequent growth. Table 3, Model 1 results show that this relationship is positive and significant for stock option programs (\( \beta = 0.14, p < .05 \)) and bonus programs (\( \beta = 0.15, p < .05 \)) but not flex-time programs (\( \beta = 0.08, \text{n.s.} \)). Therefore, Hypothesis 1 is partially supported.

Hypothesis 2 states that MHR use in the form of (a) stock option programs, (b) bonus programs, and (c) flex-time programs is positively related to subsequent productivity. Table 3, Model 4 results show that this relationship is positive and significant for stock option programs (\( \beta = 0.19, p < .05 \)) and bonus programs (\( \beta = 0.15, p < .05 \)) but not flex-time programs (\( \beta = 0.03, \text{n.s.} \)). Therefore, Hypothesis 2 is partially supported.
### Table 2

Correlation Matrix

|       | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Employees (T0) | —   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2. Mean Growth (T1–T5) | .04  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3. Stock Options (T1–T5) | .15* | .13* |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4. Bonus Program (T1–T5) | .13* | .09* | .49* |     |     |     |     |     |     |     |     |     |     |     |     |
| 5. Flex Time (T1–T5) | .09* | .12* | .61* |     |     |     |     |     |     |     |     |     |     |     |     |
| 6. Productivity (T0) | .16* | .06  | .12* | .16* | .13 |     |     |     |     |     |     |     |     |     |     |
| 7. Mean Productivity (T1–T5) | −.02 | .07  | .21* | .18* | .07* | .64 |     |     |     |     |     |     |     |     |     |
| 8. Education | −.01 | −.01 | .11* | .09* | .03 | .10* | .05 |     |     |     |     |     |     |     |     |
| 9. Industry Experience | −.03 | .02  | .11* | .03 | .01 | .06 | .02 | .09* |     |     |     |     |     |     |     |
| 10. Venture Experience | .02  | .21* | .01  | .11* | −.05 | .09 | .15 | .01 | .05 |     |     |     |     |     |     |
| 11. Gendera | .01 | .02 | −.06 | −.14* | .01 | .01 | .02 | −.08* | .05 | −.12* | −.07 |     |     |     |     |
| 12. NAICS | .03 | −.02 | −.06 | −.08 | .05 | .03 | −.07 | .01 | −.12* | −.04 | −.07 |     |     |     |     |
| 13. Owners | .23* | .03 | .05 | .23* | −.12* | .18* | .06 | −.04 | .05 | −.02 | .07 | −.03 |     |     |     |
| 14. Racea | .10 | .02 | .13* | .06 | −.08* | .03 | .01 | −.02 | .12* | .01 | .01 | −.01 | .05 |     |     |
| 15. Equity Financing | .08* | .04 | .06 | −.05 | .03 | −.07 | .05 | .12 | .13 | .12* | −.09* | .03 | .10* | −.09* |     |

Note: \( N = 677 \) firms with 4,062 observations over 6 years. For the North American Industry Classification System (NAICS) code variable, Industry Code 51 was coded as 0 and Industry Code 54 was coded as 1. Values reported for employee productivity and assets in the 1,000s.

*Gender and race refer to the percentage of owners who are female and White, respectively.

*\( p < .05 \).
Table 3

Relationships of Motivation-Enhancing Human Resource Practices With Subsequent Firm Growth and Firm Productivity

| Variables                        | Model 1       | Model 2       | Model 3       | Model 4       | Model 5       | Model 6       |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Controls (Level 2)               |               |               |               |               |               |               |
| Firm Size (T0)                   | .16*          | .16*          | .15*          | -.01          | .02           | .15*          |
| Productivity (T0)                | .06           | .06           | .05           | .27*          | .25*          | .26*          |
| Equity Financing                 | .06           | .08           | .03           | .06           | .08           | .02           |
| NAICS                            | .02           | .04           | .05           | -.06          | .06           | -.05          |
| Race                             | -.09*         | -.15*         | -.18*         | -.03          | -.03          | -.18*         |
| Gender                           | -.03          | -.06          | -.02          | .02           | -.03          | -.02          |
| Owners                           | .08*          | .08*          | .08*          | .17           | .07*          | .08*          |
| Education                        | .02           | .01           | .03           | .03           | .04           | .03           |
| Industry Experience              | .01           | .01           | .03           | .02           | .03           | .05           |
| Venture Experience               | .02           | -.01          | .02           | .03           | .03           | .02           |
| Main Effects (Level 1)           |               |               |               |               |               |               |
| Time                             | .10*          | .00           | .04           | .09†          | .09           | .04           |
| Growth (T – 1)                   | .18*          | .24*          | .22*          | .05           | .05           | .04           |
| Productivity (T – 1)             | .04           | .01           | .08           | .41*          | .39*          | .22*          |
| Stock Option Program             | .14*          | .16*          | .21*          | .19*          | .20*          | .13*          |
| Bonus Program                    | .15*          | .18*          | .16*          | .15*          | .14*          | .11*          |
| Flex-Time Program                | .08           | .03           | .16*          | .03           | .03           | .16*          |
| Discontinuity Effects (Level 1)  |               |               |               |               |               |               |
| Adoption                         | -.11*         | -.12*         | -.22*         | -.10*         |               |               |
| Postadoption Slope               | .11*          | .02           | .09*          | .15*          |               |               |
| Stage Effects (Level 1)          |               |               |               |               |               |               |
| Firm Stage                       | .05*          |               |               |               | .25*          |               |
| Adoption × Stage                 | .00           |               |               |               | -.07*         |               |
| Adoption Slope × Stage           | .18*          |               |               |               | .07*          |               |
| Stock Option Program × Stage     | .18*          |               |               |               | .08*          |               |
| Bonus Program × Stage            | .15*          |               |               |               | .07*          |               |
| Flex Time × Stage                | .18*          |               |               |               | .10*          |               |
| Pseudo $R^2$                     | .18*          | .23*          | .28*          | .24*          | .27*          | .31*          |
| Δ Pseudo $R^2$                   | .05*          | .05*          | .05*          | .03*          | .04*          |               |
| Akaike Information Criterion    | 6,038.86      | 5,993.10      | 5,762.98      | 2,864.19      | 2,731.38      | 2,673.98      |
| Log Likelihood                   | -3,121.20     | -3,083.55     | -2,973.46     | -1,468.35     | -1,382.63     | -1,268.93     |

Note: The table shows standardized coefficients for each measure. $N = 677$ firms with 4,062 observations. Race was operationalized as the percentage of non-White owners. Gender was operationalized as the percentage of female owners. $T = \text{time}; \text{NAICS} = \text{North American Industry Classification System code}.$

* $p < .05$
† $p < .10$

Hypothesis 3 states that initial MHR adoption will have a negative effect on (a) firm growth and (b) firm productivity. Results shown in Table 3, Models 2 and 5 indicate that initial MHR adoption has a negative effect on both firm growth ($\beta = -.11, p < .05$) and firm productivity ($\beta = -.22, p < .05$). Therefore, Hypothesis 3 is fully supported.
Hypothesis 4 states that there will be positive postadoption slopes for (a) firm growth and (b) firm productivity. Results shown in Table 3, Models 2 and 5 demonstrate that the post-adoption slopes for firm growth ($\beta = 0.11, p < .05$) and firm productivity ($\beta = 0.09, p < .05$) are positive. Therefore, Hypothesis 4 is supported. Figure 2 displays the results of our discontinuous growth models.
Hypothesis 5 states that post–MHR adoption slopes depend on firm stage such that the postadoption slopes for (a) growth and (b) productivity are stronger if the firm is in a growth goal stage. Table 3, Model 3 results show that for firm growth, the interaction between firm stage and adoption slope is positive ($\beta = 0.18, p < .05$). A simple-slopes analysis shows that, in the viability stage, the coefficient for the adoption slope is negative and significant ($\beta = -0.16, p < .05$). In the growth goal stage, the coefficient is positive and significant ($\beta = 0.20, p < .05$). Similarly, Table 3, Model 6 results show that, for firm productivity, the interaction between firm stage and adoption slope is positive ($\beta = 0.07, p < .05$). A simple-slopes analysis shows that, in the viability stage, the coefficient for the adoption slope is not significant ($\beta = 0.08, \text{n.s.}$). In the growth goal stage, the coefficient is positive and significant ($\beta = 0.22, p < .05$). Figure 3 displays these relationships graphically. On the basis of these results, Hypothesis 5 is fully supported.

Hypothesis 6 states that firm stage will moderate the relationship between MHR usage and (a) firm growth and (b) firm productivity such that these relationships will be weaker when the firm is in a viability goal stage than when it is in a growth goal stage. Results shown in Table 3, Model 3 indicate that, for firm growth, the interactions between firm developmental stage and stock options ($\beta = 0.18, p < .05$), bonuses ($\beta = 0.15, p < .05$), and flex time ($\beta = 0.18, p < .05$) are all statistically significant. Similarly, Table 3, Model 6 results show that, for firm productivity, the interactions between firm stage and stock options ($\beta = 0.08, p < .05$), bonuses ($\beta = 0.07, p < .05$), and flex time ($\beta = 0.10, p < .05$) are all statistically significant. Figures 4 and 5 display the form of these interactions for growth and for productivity, respectively. These results generally show that the relationship between each practice and subsequent growth is stronger in the growth goal stage than in the viability goal stage. A simple-slopes analysis of the interaction for firm growth shows that, in the growth goal stage, the effects are all positive and significant for stock options ($\beta = 0.39, p < .05$), bonuses ($\beta = 0.31, p < .05$), and flex-time programs ($\beta = 0.34, p < .05$). In the viability stage, the effects are weaker for stock options ($\beta = 0.21, p < .05$), bonuses ($\beta = 0.16, p < .05$), and flex-time programs ($\beta = 0.16, p < .05$). A simple-slopes analysis of the interaction for firm productivity shows that, in the growth goal stage, the effects are all positive and significant for stock options ($\beta = 0.20, p < .05$), bonuses ($\beta = 0.18, p < .05$), and flex-time programs ($\beta = 0.26, p < .05$). In the viability stage, the effects are weaker for stock options ($\beta = 0.13, p < .10$), bonuses ($\beta = 0.11, p < .10$), and flex-time programs ($\beta = 0.16, p < .05$). Therefore, Hypothesis 6 is supported.

Supplemental Analyses

In order to buttress our results, we conducted several supplemental analyses.

Survival effect. One of our concerns in analyzing our data was that there may have been a significant selection or survival effect in our analyses: For example, firms exiting the sample might significantly differ from firms included in the sample. Our data set is unique because we can directly test the degree to which including firms that did not survive influenced the effects of our results. To test for a survival effect, we reran our analyses and included firms that did not survive all seven time periods. Results from this analysis confirmed a pattern of results similar to those reported here. Additional information on this result is available from the authors.
Some research on entrepreneurial firms suggests that organizational plans or “blueprints” developed in the early stages of a firm’s life can continue to influence outcomes later on in a firm’s life (J. N. Baron, Hannan, & Burton, 2001). To test for this effect, we assessed the total number of MHR practices a firm used at Time 0. Results showed that these relationships were not significant for growth ($\beta = 0.02$, n.s.) or productivity ($\beta = -0.01$, n.s.). Similarly, results also showed that Time 0 MHR practices did not have statistically significant interactions with firm stage for firm growth ($\beta = 0.04$, n.s.) or firm productivity ($\beta = 0.02$, n.s.).
**Summary of Results**

Our results generally supported the hypotheses. First, our results showed that MHR usage had a positive relationship with subsequent firm growth and productivity. Second, our results showed that the initial adoption of MHR practices increased the slope of productivity and growth in firms, though there were short-term negative effects. Third, and finally, our results showed that the firm’s stage of development moderated the benefits of these HR practices such that the benefits to growth and productivity emerge only when firms were in the growth
goal stage. Therefore, MHR practices have somewhat mixed utility for new venture performance: Depending on when they are adopted, they can either facilitate or hinder growth.

Discussion

This study develops and tests a theoretically driven model of how decisions about adopting HR practices facilitate a firm’s subsequent growth and productivity. Drawing on the RBV and general systems theory, we articulated a model of how the use and initial adoption of MHR practices influences subsequent growth and productivity and how the stage of firm
development moderates these facilitating effects. Our hypotheses were generally supported, in that the use and adoption of these MHR practices were positively associated with subsequent firm growth and productivity. However, this relationship is complex because the initial adoption of MHR practices creates short-term costs that delay firms from seeing immediate benefits. In addition, our results suggest a considerable caveat in the relationship between MHR and subsequent performance: The use and adoption of MHR practices while firms are still in a viability goal stage neutralizes the benefits of MHR on subsequent firm growth and productivity. Each component of our study advances our understanding of how MHR practices can facilitate firm growth and productivity. Our contribution is a theoretical model that adds to understanding of when adopting MHR practices best facilitates subsequent firm growth and productivity. In doing so, our study addresses issues central to several literatures, including the literature on strategic HRM, the literature on the RBV, and the literature on human capital in entrepreneurship.

Theoretical Implications

The current study has three major theoretical implications. It identifies a link between MHR practices and subsequent firm growth and productivity, it shows how initial MHR adoption creates short-term inefficiencies with long-term benefits, and it demonstrates that the stage of firm development moderates the relationship between MHR and subsequent firm growth and productivity. Our study’s finding on the link between firm growth and productivity with MHR use has implications for the RBV. Specifically, our study builds on recent research that suggests that HR investments such as MHR or HPWSs form part of an adaptation process that decision makers for new firms use to manage human capital resources as the firm grows and changes (Shin & Konrad, in press). Our findings also align well with research showing that decisions about managing human capital are critical components of systems that firms use to develop high operational performance (Colbert, 2004; Nyberg et al., 2014).

A fundamental assertion of the RBV research on HR investments is that these systems enable firms to acquire and activate HRs (Lado & Wilson, 1994). The results of our study confirm that MHR practices demonstrate an empirical validity both to attract talent via increases in the number of employees and to activate that talent via increased productivity.

Our study’s findings regarding MHR adoption and postadoption slopes also have implications for the literature on strategic HRM and human capital theory. The idea of lag between the implementation of HR investments and their influence on firm outcomes has been a part of discussions about the value of HR practices since the earliest theoretical analyses of strategic HRM within a resource-based framework began (Wright et al., 2001). However, relatively few studies have investigated this assumption. Our study is among a small group to systematically investigate how the effects of HR practices unfold over time. Our study’s use of the RBV combined with the methodology of discontinuous growth modeling allows us to more accurately specify how these short- and long-term effects manifest.

By examining MHR practices, the specific timing of their adoption, and the stage of firm development at which they are implemented, our study provides insight into how the facilitating effects of MHR depend on the timing of their implementation. These results address a growing area of interest in strategic HRM research regarding how the implementation of HR practices affects their utility (Jackson et al., 2014). Overall, it appears that delaying the adoption
of MHR practices until firms have reached a certain level of development has positive benefits for firm performance. Our findings align well with other research that assesses how implementation moderates the link between HR practices and their effectiveness (Aguinis & Lawal, 2013; Sparrow, Farndale, & Scullion, 2013). We also extend this research by investigating temporal factors as a component of implementation and how the value of MHR practices depends on contextual factors (Chadwick et al., 2013; Guest, 2011; Jackson et al.).

Practical Implications

Our study’s implications for practitioners center on when and how new firms can most effectively leverage HR practices to improve firm performance. Our results demonstrate that, in general, new venture founders need to consider decisions about HR practices as part of the functional adaptation process for their firm to grow and increase productivity. As firms grow and increase their production capacity, the demands to coordinate and manage employees become increasingly complex; thus, founders must either delegate these activities or develop practices to manage such issues (Simon, 1965). Leaders of new ventures must consider HR practices as a tool to facilitate growth and adapt their organization to meet its changing needs and goals. Ineffective management of existing employees can hinder firm growth and its ability to leverage human capital toward competitive advantage. Our findings suggest that MHR practices are a crucial step in facilitating such growth and productivity gains.

Additionally, we suggest that firm leaders must carefully consider when to begin investing in HR practices. Many scholars recognize the importance of HR investments in both new and established ventures (Wright et al., 2014). However, because of the influence of short-term inefficiencies and firm developmental stages, a new firm’s leaders may not see the facilitating effects of HR practices immediately emerge. Our results show that it can take over a year for a new firm to see significant benefits from MHR usage. Furthermore, positive changes may or may not occur depending on a firm’s development stage and related goals. On one hand, firms that implemented MHR before completing the viability goal stage were less likely to see a return on the resources invested in MHR implementation. On the other hand, firms that implemented MHR practices during the growth goal stage saw substantial increases in both productivity and growth in subsequent years. For this reason, we recommend that firms considering MHR practices make an effort to understand where they fall in the progression from viability to growth as part of their decision-making process. MHR practices included in a plan for growth implemented after a firm has demonstrated its viability will benefit patient firms.

Although the results of our study seem logical (i.e., managers of new ventures should not invest in MHR practices until they have the capacity to use them effectively), a slightly different interpretation of these results suggests that managers should eschew HR investments until they are profitable. We caution against such an interpretation. Organizations tend to be path dependent and sensitive to the initial conditions of their founding (Beckman & Burton, 2008). If new organizations opt for a short-term perspective that does not consider how the organization will eventually use HR practices to facilitate growth and productivity, their organization may stumble as it attempts to grow and change (R. A. Baron, 2003). Rather, we suggest that leaders of new ventures should judiciously evaluate when they can best implement MHR practices to facilitate productivity and growth, considering how temporal factors influence that implementation.
Limitations, Future Research, and Conclusion

Our findings regarding the facilitating effects of MHR practices on firm growth and productivity suggest the need for more theoretical investigation of HR practices in new ventures. Such research could utilize configurational approaches (Fiss, 2007; Ragin, 2008) to advance knowledge about how HR systems affect firm growth. Our study used general systems theory and the RBV to delineate how HR investments are part of the adaptive process of resource investments new ventures use as they grow and change. A central tenet of the RBV is that valuable resources must be configured—acquired, developed, bundled, and leveraged—in order to create sustained competitive advantage (Barney, Ketchen, & Wright, 2011; Sirmon, Hitt, & Ireland, 2007). A more complete understanding of how configurations of HRs and human capital relate to firm changes over time has the potential to improve our understanding of organizational processes of growth and change (Fiss; Short, Payne, & Ketchen, 2008). Although our study focused on aspects of HR investments related to temporal issues, other studies might consider the effects of sequencing or other types of bundling. A number of studies have shown that bundles of HR investments, such as HPWSs, are effective ways to reduce turnover or encourage firm growth (e.g., Batt & Colvin, 2011). However, little research suggests a particular order in which these bundles of practices should be implemented to optimize their benefits. In this way, our investigation of temporal factors may be part of a larger constellation of inquiries about HR implementation factors that influence the link between HR investments and firm performance outcomes. Researchers could examine how such factors maximize, minimize, accelerate, or decelerate the benefits of HR investments or how the initial high performance of firms influences the subsequent action involving HR practices. For example, our correlation matrix shows modest, but positive, significant relationships between the initial size and productivity of firms and their subsequent use of MHR practices. Investigating how firm performance relates to subsequent HR investments would benefit the strategic HRM literature.

Although our study has a number of strengths, we must interpret our results in light of its limitations. For example, our research implies that there are effective and ineffective ways to implement MHR practices. However, our study does not address a number of factors involved in implementation, such as who is in charge of implementation, employee buy-in, or how different forms of equity financing may influence subsequent implementation of HR practices. Recent research has suggested that HR investments benefit from both effective implementation by managers and top management support of such practices (Chadwick et al., 2014). In addition, our study attributes decisions about HR practice implementation to the strategic choices of the manager-owners of the new venture. However, in many organizations, multiple stakeholders, such as investors, boards, or mentoring advisors, may also have significant influence on strategic choices about HR practices. For example, investors with significant equity stakes in a new firm may advise against stock option programs that dilute the concentration of ownership in the organization. Future research might address how different stakeholders in new organizations influence these decisions.

Another limitation of this study is that although we acknowledge that the cognitive frameworks of a top management team influence decision making about HR investments (e.g., Chadwick et al., 2014), we do not directly measure such cognitive frameworks. We encourage future research to address how specific cognitive frameworks and capabilities emerge from founder knowledge and experience and how such frameworks might influence the
facilitating effects of MHR practices. One possibility is that founder knowledge and experience influence specific frameworks regarding strategic human capital decisions. Another possibility is that the general knowledge and expertise of founders help implement a variety of strategic choices related to effective performance that also includes MHR practices.

Finally, there are some limitations specific to our data set. For example, our proxy measure of pre-/postrevenue does not perfectly capture the developmental goals of these organizations; thus, future research could provide further insight into a stage model by more directly measuring the specific goals of organizations and how they interact with HR practices. Relatedly, the KFS is a rich longitudinal data set with many metrics of firm success beyond those in our study, such as intellectual property creation, acquisition, and profitability. We encourage future research to take advantage of this and other longitudinal data sets to better understand how time influences the relationship between HR investments and firm performance outcomes.

In conclusion, our study addresses a key question about how MHR practices designed to attract, retain, and motivate employees in a new firm can influence performance. Our study’s results show that there are mixed benefits for the adoption of MHR practices depending on when they are implemented. We suggest that new ventures benefit most from using MHR practices once firms have become viable and seek to grow.

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