© Academy of Management Journal
2009, Vol. 52, No. 5, 996–1015.

THE CONSEQUENCES OF HUMAN RESOURCE STOCKS AND FLOWS: A LONGITUDINAL EXAMINATION OF UNIT SERVICE ORIENTATION AND UNIT EFFECTIVENESS

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Drawing from resource-based theory, we argue for a broader interpretation of human capital and demonstrate that unit service orientation contributes to unit effectiveness over time. Operationalizing unit service orientation as the unit-level (n = 1,255) aggregate of individual level (n = 114,198) service employee competencies, we modeled the data over three quarters and found a positive but decreasing relationship between the flow of unit service orientation and changes in unit effectiveness. Although building a high-quality stock is important, we show that the key driver of change in unit effectiveness is the flow of unit service orientation over time.

In the modern knowledge-based and service-oriented economy, the success of many firms has shifted from acquisition of tangible (physical) resources to accumulation of intangible (human) resources. "Human capital," defined as the unit-level aggregate of individual knowledge, skills, and abilities (KSAs), is theorized to be one of the most critical resources for unit effectiveness (Barney & Wright, 1998). Drawing primarily from the resource-based view of the firm (Barney, 1991) and human capital theory (Becker, 1964), strategic human resource management (SHRM) scholarship suggests that human resource (HR) practices contribute to unit effectiveness because they build a composition of human capital that is valuable, rare, inimitable, and nonsubstitutable (Wright, Dunford, & Snell, 2001). Human capital is therefore theorized to create between-unit differences and, ultimately, unit effectiveness.

The purpose of this study was to test several key predictions in SHRM and resource-based theory by demonstrating that changes in the stock *and* flow of human capital contribute to unit effectiveness over time. We studied a large retail organization because in this context, human capital is expected to influence unit effectiveness, yet there is considerable variability in the stock and flow of human capital. Consequently, our study provides important theoretical advances for the resource-based view, SHRM scholarship, and the service literatures, as well as new managerial implications for demonstrating human resources' financial impact.

First, we operationalized human capital as *unit service orientation*—the unit-level aggregate of individual employee service-orientation KSA scores. Most SHRM research has not studied human capital directly but inferred its effects through HR practices or proxy measures (Gerhart, 2005; Wright & Haggerty, 2005). Yet theoretically, it is the aggregate of employee KSAs that is hypothesized to be the source of unit effectiveness (Barney & Wright, 1998). Within the service literature, research has shown that aggregates of employee climate perceptions or job attitudes relate to unit outcomes (see Ryan and Ployhart [2003] and Schneider and White [2004] for reviews), but these are not KSAs in the sense that KSAs represent abilities or traits *necessary* for job performance. Climate perceptions and job attitudes are more relevant to perceptions of a work environment and may or may not be necessary for individual job performance. Thus, we ar-

We thank Audrey Korsgaard, Ivey MacKenzie, Lynn McFarland, Tom Moliterno, Matt Semadeni, and John Slocum for helping or commenting on drafts of this article. Several members of the Personnel Human Resources Research Group (PHRRG) and SAPs also provided many helpful suggestions. Finally, we express our most sincere thanks to Sara Rynes and the anonymous reviewers whose comments and suggestions resulted in a dramatic improvement in this work. Jase Ramsey is now at the Fundação Dom Cabral in Brazil.

gue that studying aggregates of employee KSAs helps broaden the definition of human capital to also include additional valuable types such as aggregate employee personality or service orientation.

Second, we provide critical tests of resource-based theory by demonstrating that *changes* in the flow of unit service orientation relate to *changes* in objective unit effectiveness over time. Past research has emphasized stocks of human capital (i.e., the relationship between human capital and unit outcomes at a single point in time) but neglected consideration of the flows of human capital (i.e., how the stock of human capital changes over time) (Dierickx & Cool, 1989). One reason for the inimitability of a resource is that its prior short- and long-term histories make it path dependent, yet a longitudinal focus remains largely neglected in the SHRM literature. As Wright and Haggerty stated, "Current theory exploring the relationship between HRM and economic success has not deeply considered temporal issues. In most instances time is either assumed as a constant, or considered in a relatively shallow way" (2005: 166). This neglect is noteworthy, because the flow of human capital is necessary to ensure the resource manifests sustained contributions to unit effectiveness. We propose that the longitudinal relationship between unit service orientation and unit-level effectiveness is positive but decreasing over time and that this relationship is heterogeneous across units.

THEORY AND HYPOTHESES

The Structure of Human Capital Resources: Putting People Back into Business Units

In most SHRM scholarship, HR practices (e.g., staffing, training) are theorized to create a particular form of aggregate knowledge, skills, and abilities (human capital), that in turn contribute to unit-level outcomes (e.g., Barney & Wright, 1998). Human capital is therefore a key explanatory mechanism from several theoretical perspectives.

Human capital theory comes from economics and articulates the value, consequences, and transferability of human capital at individual and aggregated levels. Its central argument is that the acquisition of both general and unit-specific human capital contributes to individual and unit effectiveness (Becker, 1964). Organizations that make investments in developing unit-specific human capital will (with sufficient retention) recover these costs through increased productivity as their workforces acquire job-, organizational-, and industry-specific knowledge (Strober, 1990). Although research has shown that there are positive returns on individuals' investments in human capital (Becker, 1964), we have focused on the unit level; thus, human capital is the aggregate of individual forms of knowledge and experience and, as such, should have unit-level consequences. There has been considerable research in the economics and education literatures supporting a link between aggregate human capital (operationalized as literacy rates, school enrollment rates, teacher experience, and years of education) and a variety of unit-level outcomes (e.g., turnover rates, economic growth) (see Aaronson, Barrow, & Sander, 2007; Lerner, 1983; Sweetland, 1996).

The resource-based view (Barney, 1991) argument is that units are heterogeneous in their resources; between-unit differences in these resources contribute to competitive advantage. Human capital is one of several internal resources. Yet, in contrast to human capital theory, the resource-based view gives more careful consideration to different types of human capital. Human capital is *valuable* when it contributes to a unit's core capabilities. It contributes to competitive advantage when it is also *rare*—that is, not equally held by competitors; it may become a basis for sustained competitive advantage if it is also *inimitable*; and it may be inimitable because of the unit's path dependency (performance trajectory over time) and unique history (e.g., the business unit has been the preferred employer and hence highly attractive to applicants), causal ambiguity (uncertainty over which specific combination of practices builds the stock of human capital), or social complexity (interpersonal relationships between coworkers, or between coworkers and customers). An additional requirement for sustainability is that human capital may be *nonsubstitutable* with alternative resources (Barney & Wright, 1998). Although there exists the possibility of technological or process substitutes for human capital exists (e.g., Bamberger & Meshulam, 2000), there are also limits to the extent to which human capital can be replaced. Note that the resource-based view places emphasis not on specific HR practices, but on human capital itself. This is an important distinction, because human capital is an intangible resource and more difficult to imitate than specific HR practices (Wright et al., 2001).

Thus, a prediction based on both human capital and resource-based theories is that it is the unit *aggregate* of individual KSAs that leads to unit effectiveness over time. In contrast, most empirical research on strategic human resource management infers human capital only from HR practices, proxy measures, or informant self-reports (Wright et al.,

2001).[1] For example, Takeuchi et al. (2007) used manager self-reports of their *perceptions* of employee performance as an index of human capital. Informant or proxy measures are often necessary, but they have two important limitations: First, because they are often based on a single manager's perceptions, their construct validity is questionable (in that common method bias, rater bias, and/or inaccuracy may be present), and they may have low reliability (Gerhart, 2005; Gerhart, Wright, McMahan, & Snell, 2000). Second, HR practices and proxy or informant measures prohibit an examination of within-unit variability and change over time. When a single individual responds for an entire business unit (e.g., a single HR manager reporting on employee skills), the assumption is that all employees in the unit are equal on the characteristics being rated. However, HR practices will not create complete agreement in employee attitudes or behaviors over time. For example, Bowen and Ostroff (2004) argued that HR practices are means of communicating an organization's goals in order to change individual cognitions and behavior. Because HR practices are forms of communication, employees vary in how well they understand, perceive, and respond (i.e., within-unit variability is present). Wright and Haggerty argued that "employee reactions are actually individual-level variables that are central to the proposed causal process, yet are currently ignored in unit-level theories of strategic HRM" (2005: 170).

These limitations are not simply methodological; they directly address the validity of empirical support for SHRM scholarship and the resource-based view. Demonstrating that human resource practices contribute to firm performance provides only modest support for the resource-based view, according to which human capital resources—not practices—comprise the source of competitive advantage (Wright et al., 2001). HR practices may be easily copied, but the quality of human capital is more likely to be inimitable because it is socially complex, causally ambiguous, and uniquely developed, on the basis of a given firm's history (Barney, 1991; Barney & Wright, 1998). If correct, then informant self-report measures must be deficient because, by definition, managers should not be able to adequately describe the human capital (i.e., it is causally ambiguous and socially complex [Barney, 1991]). Among others, Gerhart has noted such limitations of the extant literature and offered an alternative:

> [Researchers] need to include data from different sources and levels of analysis (Bowen & Ostroff, 2004), given that HR system policies (often measured by asking HR executives) are typically theorized to operate through individual level employee reactions such as motivation, ability, and opportunity. . . . Yet this multi-level/multi-source data (and thus corresponding tests of intervening processes) is largely absent. (2005: 177)

Human Capital in Service Firms: Unit Service Orientation

One benefit of focusing directly on aggregate KSAs is that it becomes possible to extend and refine the conceptualization of human capital. Prior applications of human capital theory and research have almost universally emphasized knowledge, education, and experience (Strober, 1990). These constructs are clearly important, but resource-based view and SHRM scholarship has suggested that other aggregate KSAs may also be important, because they are linked to specific types of unit effectiveness in particular contexts. Indeed, recent suggestions for improving resource-based view research have proposed thinking first about unit performance and then "working backwards" to identify the relevant sources of unit effectiveness (Rouse & Daellenbach, 2002). Such suggestions are consistent with HR scholarship showing that personality and service orientation may be particularly valuable when major parts of a job involve social interaction, collaboration, and communication (e.g., Hough & Schneider, 1996). It is worth noting that the resource-based view offers no predictions about which *types* of resources are important; it specifies only the conditions under which a particular resource will contribute to sustained competitive advantage. For example, if employees from one firm deliver higher-quality service than competitors, service orientation can be a determinant of unit effectiveness (Barney, 1991), even though aggregate "service orientation" does not fit neatly into the traditional definition of human capital. Wright et al. (2001) emphasized the role of both aggregate ability *and* motivation as important determinants of firm effectiveness, yet motivational constructs are typically excluded from human capital definitions.

In keeping with this expanded perspective, Ployhart, Weekley, and Baughman (2006) recently presented an alternative, broader operationalization of human capital in service firms that is based on

[1] It is also interesting to note that in many SHRM studies, unit performance is likewise assessed with proxy measures or informant self-reports (Carmeli & Schaubroeck, 2005; Takeuchi, Lepak, Heli, & Takeuchi, 2007).

aggregate personality. Drawing from multilevel theory (Kozlowski & Klein, 2000), Ployhart et al. (2006) demonstrated that job and organizational-level personality were forms of human capital and represented by the unit aggregate of individual personality KSA scores. They further showed how unit differences in personality predicted individual service performance and job satisfaction (see also Schneider, Smith, Taylor, and Fleenor [1998]).

However, not all individual differences emerge into theoretically relevant unit-level constructs that may contribute to a unit's core capabilities. Such aggregation is only meaningful to the extent that it occurs for core employees and for the unit's core competencies and capabilities (Lopez-Cabrales, Valle, & Herrero, 2006; Prahalad & Hamel, 1990). *Core employees* are those whose jobs are most central to the existence of a firm (e.g., drivers in a trucking firm, service providers in a retail store). They perform the essential functions and tasks that define the firm's existence. *Core competencies* are those forms of human capital that core employees must exhibit to contribute to the firm's strategy and goals (i.e., they are valuable) (Lepak & Snell, 1999; Prahalad & Hamel, 1990).

In this study, we examined the unit service orientation of frontline retail associates as an operationalization of human capital. The service sector is the largest sector in private industry and represents about 67.8 percent of the U.S. gross domestic product (U.S. Department of Commerce, 2006, http://www.commerce.gov). Retail associates are core employees because they are the largest group of nonmanagerial employees involved in the provision of service (Delery & Shaw, 2001; Osterman, 1994). Unit service orientation is a valuable core competency because it contributes directly to the mission and goals of a retail organization (Lepak & Snell, 1999; Schneider & White, 2004). We define *unit service orientation* as a unit's aggregate, collective willingness and ability to deliver high-quality service. However, the roots of unit service orientation lie at the individual level, because it is a multidimensional construct capturing individual differences in willingness to treat customers with respect and dignity, perceptiveness of customer wants, and ability to communicate effectively and manage impressions (Hogan, Hogan, & Busch, 1984; Schneider & Bowen, 1995). Individuals with greater service orientation are more predisposed and able to provide higher-quality service at the individual level (Frei & McDaniel, 1998; Hogan et al., 1984). Units with highly service-oriented individuals will have greater unit mean service orientation (quality of human capital stock), thereby producing interunit differences in collective capacity to deliver service (Ployhart et al., 2006; Schneider et al., 1998).

Thus, in our conceptualization the meaning of unit service orientation is similar to the meaning of resources in the resource-based view and in SHRM. Consequently, unit service orientation may contribute to unit effectiveness over time. First, as noted above, it is a valuable and rare resource in service firms. Second, it is difficult to imitate because unit-level constructs are causally ambiguous and socially complex. Barney and Wright stated, "Exploitation of the synergistic value from a large number of individuals who work together is quite costly if not impossible for competitors to imitate" (1998: 39). Finally, as we discuss below, variability in the longitudinal flow of unit service orientation makes it difficult to copy (i.e., path dependency exists).

Although our operationalization of unit service orientation is similar to that of Ployhart et al. (2006), we extend their study in important ways. First, our study is longitudinal and looks at both the stock and flow of unit service-orientation accumulation, whereas Ployhart et al.'s (2006) was cross-sectional. Second, we assess the unit-level, objective, financial consequences of unit service orientation; Ployhart et al. only examined individual-level, subjective job performance evaluations and self-reported job satisfaction. Finally, we examine unit service orientation, whereas Ployhart et al. (2006) examined unit-level personality. These are similar but not identical constructs. Service orientation is typically the stronger determinant of individual service performance (Hough & Schneider, 1996) and is becoming the focus of modern service research (Salvaggio, Schneider, Nishii, Mayer, Ramesh, & Lyon, 2007).

The Stock and Flow of Unit Service Orientation and Unit Effectiveness

A longitudinal perspective is necessary to test whether unit service orientation leads to changes in unit effectiveness over time, because it takes time for unit-level resources to manifest unit-level changes (Armstrong & Shimizu, 2007; Kozlowski & Klein, 2000). This time dependency is particularly important in the retail industry because of the high turnover and volatility of talent (e.g., Kacmar, Andrews, Rooy, Steilberg, & Cerone, 2006). However, most SHRM research has been cross-sectional or focused on static HR practices (Becker & Huselid, 2006; Gerhart, 2005; Wright & Haggerty, 2005). There is surprisingly little evidence that human resources contribute to unit effectiveness over time. Becker and Huselid summarized the paucity of longitudinal research: "Unfortunately, this issue tends

to typically receive a perfunctory mention in the Limitations section of most empirical articles and is rarely addressed directly" (2006: 913). Our study helps address this neglect by taking a more careful examination of longitudinal relationships between unit service orientation and unit effectiveness.

According to human capital theory, it takes time for investment in human capital to create positive returns (Strober, 1990), as the generic forms of human capital must transfer into more firm-specific knowledge and behaviors (e.g., going from general knowledge of service provision to understanding the unique customers of a specific firm). In the resource-based view, time is vital because of the sustainability aspect of strategic resources (Armstrong & Shimizu, 2007) and the fact that resources are dynamic and have life cycles (Helfat & Peteraf, 2003). Valuable and rare resources may allow units to be competitive, but this advantage will only be sustainable if the resources are also inimitable and/or nonsubstitutable (Barney, 1991). A key requirement for inimitability is the path dependence or prior history of the units' resources. Specifically, business units follow trajectories that are in part driven by their prior performance, unique relations with the external environment (e.g., customers, local economic conditions), and other internal resources (e.g., managerial competence) (Barney, 1991). "Time compression diseconomies" among resources suggest that competitors cannot develop a resource to equal effectiveness under compressed time (Dierickx & Cool, 1989). A good example is the equity that a firm acquires from its reputation or brand; it is not something easily copied or lost. Trying to quickly build human capital is unlikely to reproduce the same value it has for units in which the capital has been established for a long time because, in the latter case, the unit's workforce should have more firm-specific and tacit knowledge. Human capital may also help develop process-dependent, network-based synergies.

Although the resource-based view recognizes the importance of time, several scholars have noted that it is rather vague in specifying the kinds of temporal dynamics that may occur among resources (Armstrong & Shimizu, 2007; Helfat & Peteraf, 2003). Research has not sufficiently addressed how changes in the accumulation of resources influence changes in unit effectiveness over time. Yet theory indicates that resources are dynamic and evolving. As Helfat and Peteraf noted, "The resource-based view must incorporate the evolution over time of the resources and capabilities that form the basis of competitive advantage" (2003: 998). Thus, understanding the dynamicism of resources is important for understanding their consequences.

The seminal work of Dierickx and Cool (1989) on the accumulation of resource assets nicely illustrated how resources may be dynamic and influence unit effectiveness over time. In particular, they discussed the "bathtub" metaphor, in which the amount of water in a tub represents the resource. The *stock* of the resource is represented by the amount of water in the tub at any given time. Importantly, there must be a critical mass of the resource stock for it to influence unit effectiveness (i.e., too little water in the tub makes it impossible to get clean). The *flows* of the resource are represented by the water coming into the tub through the faucet and out of the tub through the drain. Flows influence the stock of a resource and whether a critical mass is achieved and maintained. As Dierickx and Cool noted, "It takes a consistent pattern of resource flows to accumulate a desired change in strategic asset stocks" (1989: 1506). Thus, the stock of a resource at a given time is important, but the flows of the resource determine whether it produces a change in unit effectiveness.

The distinction between stocks and flows has important consequences for the study of unit service orientation. First, units must establish a critical mass (sufficient stock) of talented service providers to influence unit effectiveness. Unfortunately, we have probably all frequented retail establishments where it seemed employees were either unable or unwilling to provide quality service. Infusing such a unit with one or a few higher-quality employees might marginally help, but the unit would need to reach a sufficient stock of above-average service provision to see above-average returns. Because service providers are core employees and influence customer behavior, not having a sufficient stock of employees capable and willing to provide quality service can lower effectiveness (Schneider & White, 2004). Second, employees may choose to leave a firm or (to a degree) withhold effort (Rouse & Daellenbach, 2002). Turnover is extremely high in retail positions (Kacmar et al., 2006), so the flow (and hence stock) of unit service orientation is likely to be highly variable over time. Finally, even though HR may implement the same practices, employees do not identically perceive or adhere to the practices (Bowen & Ostroff, 2004), thereby contributing to variability in unit service orientation over time. For example, even given the same selection practices, differences in labor markets may enable one manager to hire more selectively than another manager. By directly measuring unit service orientation as the aggregate of individual KSAs, it becomes possible to examine

the consequences of changes to the stock and flow of human capital. We detail each of these points below.

First, units that create higher *stocks* of unit service orientation will perform better than units with lower stocks because of employees' greater collective willingness and ability to manifest effective service behaviors, including citizenship behaviors and teamwork (Liao & Chuang, 2004; Ployhart et al., 2006; Schneider, Ehrhart, Mayer, Saltz, & Niles-Jolly, 2005). Such employees will be more likely to identify customer preferences, adapt their behavior to different types of customers, and generally be more effective in influencing customer behavior (Gwinner, Bitner, Brown, & Kumar, 2005; Liao & Chuang, 2004). Higher-quality unit service orientation also increases the consistency of service delivery and contributes to greater customer satisfaction, loyalty, repeat purchases, and positive word of mouth (Liao & Chuang, 2004; Lovelock & Wirtz, 2004; Salvaggio et al., 2007). Employees with higher-quality service orientation may also be more likely to develop and share knowledge about customers, products, and services (Dess & Shaw, 2001; Ryan & Ployhart, 2003). Prior empirical research is consistent with these expectations (Hitt, Bierman, Shimizu, & Kochhar, 2001; Liao & Chuang, 2004; Ployhart et al., 2006).

Second, although we expect the stock of unit service orientation to be related to unit effectiveness, it is the *flow* of unit service orientation over time that should most influence change in unit effectiveness (Dierickx & Cool, 1989). By merging theory on resource life cycles (Helfat & Peteraf, 2003) with the empirical findings on customer service, we propose that the longitudinal relationship between unit service orientation and unit effectiveness is positive but decreasing over time. That is, we expect a tipping point at which unit service orientation starts to produce diminishing (although still positive) returns. We base this prediction on the capability life cycle within the dynamic resource-based view (Helfat & Peteraf, 2003), which is concerned with understanding the evolution of resources and how they form, develop, and mature. Importantly, the value of resources is expected to change over time because of changes in the environment and the "shelf life" of a resource itself. Thus, in this perspective, the contribution of a resource toward unit effectiveness will not exhibit a consistent effect (slope) over time. Rather, capabilities and resources follow what Helfat and Peteraf called an "experience" curve, because there are "inherent limits to what any team could achieve with available technologies, inputs, workers, and state of managerial practice" (2003: 1002).

In line with this theory, customer service scholarship suggests that the flow of service orientation into and out of the unit is likely to be highly variable over time, thus affecting the nature of its relationship with unit effectiveness. High turnover in retail jobs and the relative ease with which retail employees may switch employers create considerable challenges for maintaining a consistent flow and thus creation of a sufficient stock of quality employees (Kacmar et al., 2006). The relationship marketing literature has found that tremendous financial benefits accrue when units establish long-term relationships with customers, because it is more profitable to keep existing customers than to make new ones (Morgan & Hunt, 1994; Reichheld & Sasser, 1990). Therefore, units able to maintain or increase their flow of unit service orientation are likely to increase the number of repeat customers who are likely to shop more frequently, shop longer, spread more positive word of mouth, and purchase more on subsequent visits (Lovelock & Wirtz, 2004; Reichheld & Sasser, 1990; Schneider et al., 2005). Of course, increasing sales do not continue indefinitely, and as predicted by the capability life cycle (Helfat & Peteraf, 2003), the relationship (slope) between unit service orientation and unit effectiveness will start to diminish (although remaining positive). This diminishment results from the fact that, unless a unit is going to provide additional strategic investments (e.g., add personnel, increase store size, invest in new technology), the effect of the resource will reach a tipping point and start to weaken (Helfat & Peteraf, 2003). Thus, the flow of unit service orientation will positively relate to unit effectiveness because of increasing subsequent sales, but there will also be a tipping point at which the slope of unit service orientation starts to weaken.

Hypothesis 1. The flow of unit service orientation over time relates to changes in unit effectiveness, in such a way that the positive relationship gets weaker over time.

Finally, we expect between-unit *heterogeneity* in the relationship between unit service orientation and unit effectiveness: the longitudinal relationship will be stronger for some units than others. The resource-based prediction is that this heterogeneity occurs because the value of resources is context-specific and cannot be separated from a unit's unique history and distinctive relationships with external and internal factors (Barney, 1991, 2001; Helfat & Peteraf, 2003). First, resources are path dependent, which means that the unit's specific history and prior performance affect the subsequent flow and value of the resource (Barney, 2001;

Barney & Wright, 1998). Because different units may be in different parts of the resource life cycle, they might be in different parts of the curve; hence, "The exact shape of the curve might differ" between units (Helfat & Peteraf, 2003: 1004). Therefore, heterogeneity in the unit service orientation–effectiveness relationship is in part affected by prior flows of unit service orientation. Second, the value of resources is heterogeneous because of the unit's unique relationships with external and internal factors (Barney, 1991, 2001). Externally, differences in units' competitive environments may cause slope heterogeneity (Barney, 1991). For example, some units may face stiffer competition not only for customers, but also for high-quality employees. Internally, units may obtain greater value from a given resource because it is more effectively leveraged and is complemented by other strategic resources (it is socially complex) (e.g., Barney & Wright, 1998; Dierickx & Cool, 1989; Rouse & Daellenbach, 2002). For example, consistent flows of high-quality unit service orientation may occur because the unit's management recognizes it as a strategic resource, develops a culture to maintain it, and is effective at leveraging it, thereby extracting more value from the resource than other units (Carmeli & Schaubroeck, 2005; Hitt et al., 2001).

Customer service research helps specify the nature of the heterogeneity in the unit service orientation–unit effectiveness relationship predicted under the resource-based view. Units with higher-quality flows of unit service orientation will have a stronger (nonlinear) relationship and thus better unit effectiveness. For example, units that have more consistent flows of service-oriented employees will better (and more reliably) serve more customers, who in turn will report greater customer satisfaction, become more loyal, more frequently visit the stores and spend more on each visit, and spread more positive word of mouth (Liao & Chuang, 2004; Lovelock & Wirtz, 2004; Reichheld & Sasser, 1990; Schneider et al., 2006). Thus, consistently high flows of unit service orientation cascade into higher sales. In contrast, a unit chronically staffed with less-service-oriented employees will less adequately attend to customer requests, be less responsive to managerial attempts to enhance service, and be more likely to alienate customers (Liao & Chuang, 2004). These deficiencies will in turn lead to lower customer satisfaction, slower growth in customers, negative word of mouth, and lower sales over time (Reichheld & Sasser, 1990; Salvaggio et al., 2007; Schneider et al., 2005). Losing customers is perhaps the most damaging outcome because of the very high cost in obtaining new customers (Mattila, 2001).

Hypothesis 2. The positive but decreasing unit service orientation–unit effectiveness relationship is heterogeneous across units. Units with high-quality flows of unit service orientation have greater effectiveness over time than units with low-quality flows of unit service orientation.

METHODS

Sample, Context, and Boundary Conditions

Several conditions must be met to isolate unit service orientation's consequences. First, it is necessary to study identical HR systems from similar business units in a single industry. Doing so lets researchers benefit from increasing internal validity by using the same KSAs and unit criteria, while controlling for organizational and business-unit differences (e.g., promotions, advertising) and industry differences. Second, isolating unit service orientation's consequences requires a sample with sufficient numbers of employees who fulfill core roles and are nested within a sufficient number of units.

Therefore, we examined the service orientation of frontline retail service associates nested within stores from a single, large, retail organization over a period of three quarters. This context offered several advantages for testing our hypotheses. First, challenges in recruiting and retaining retail employees created the potential for relatively large swings in unit service orientation in a short time, as turnover in this industry ranges from over 50 percent to 100 percent annually. Second, service employees were considered core employees (Delery & Shaw, 2001) and a key resource for competitive advantage (Dess & Shaw, 2001; Hitt et al., 2001). Service providers comprised the face of the retail organization and had a strong influence on customer attitudes, satisfaction, and subsequent purchases that in turn had strong consequences for firm performance (Batt, 2002; Liao & Chuang, 2004; Schneider et al., 2005). Third, there were enough units, with sufficient differences in unit service orientation to allow us to examine the multilevel relationships (Kozlowski & Klein, 2000). Fourth, objective indicators of unit effectiveness were measured repeatedly over three quarters. Finally, all stores had the same HR practices, including the same selection test and hiring procedures. Managers did not have the authority to change the practices but had some discretion regarding how they weighed test and interview scores.

Participants (n = 114,198) were applicants hired by a retail department store chain headquartered in

the United States. The jobs were in various departments (e.g., sporting goods, men's/women's clothing). All applicants completed the same selection battery, because a job analysis and criterion-related validity study indicated the same KSA requirements were present for effective service provision, regardless of department.

Excluding 19 individuals who lacked demographic information, the sample was mostly female (66%) and fairly diverse, including Native Americans (0.98%), Asians (4.61%), African Americans (21.87%), Caucasians (57.01%), and Hispanics (15.52%). As in all retail samples, turnover was high: over 75 percent of the sample quit during the time period under investigation. Of those who quit, the average length of employment was 58.09 days (s.d. = 47.73). Individuals applied to one of 1,255 stores geographically distributed throughout all states except Hawaii and Alaska. Our contacts at the firm indicated the stores were largely equivalent in products and services offered. Only stores operating since 2002 were included (mean = 11 years, s.d. = 7.54 years).

Procedures

All applicants were required to complete a basic application form and service orientation predictor on premises. Because of high turnover, the predictor was used to screen out only the bottom 20 percent of the distribution. Applicants clearing this hurdle were interviewed briefly by store staff; unfortunately, the interview scores were not captured and were therefore unavailable to us. Because of the relatively low cutoff score, high turnover, and differences in local labor markets, there remained plenty of room for interstore differences in unit service orientation to emerge. We were provided with predictor data obtained in the first three quarters (as defined by the organization) of 2003: quarter 1 (February 1–April 30); quarter 2 (May 1–July 31); quarter 3 (August 1–October 31). We obtained store-level sales information from the organization's archival data from quarter 2, 2002, to quarter 4, 2003.

Measures

Individual service orientation. We measured individual-level service orientation via a composite assessing emotional stability, agreeableness, conscientiousness, educational success, and situational judgment (see Bettencourt, Gwinner, & Meuter, 2001; Hogan et al., 1984; Paajanen, Hansen, & McLellan, 1993). Drawing on a job analysis and criterion-related validity study (n = 2,937), this organization used the Kenexa Retail Associate Selector, a service-orientation battery containing three personality traits (conscientiousness, agreeableness, and emotional stability) with 15 items each, a 20-item "situational judgment" test (SJT), and a 5-item biodata-based measure of educational success. Prior research has suggested emotional stability, agreeableness, and conscientiousness are the three main personality determinants of service orientation (Frei & McDaniel, 1998; Hogan et al., 1984). Situational judgment assesses knowledge of appropriate service behaviors and ability to correctly perceive and respond to different service encounters (not unlike tacit forms of service knowledge). The SJT was developed using the critical-incident technique, meaning that real work situations comprised the item stems. Applicants then indicated which course of action they thought was best/worst in each situation. The educational success measure assessed academically related variables such as high school grade-point average (GPA), highest grade completed, and number of awards received. The overall predictor composite was formed by summing the standardized scales, and then converting the composite score to a T-score. T-scores, standardized values that, with a perfectly normal distribution, have a mean of 50 and a standard deviation of 10, are a frequently used alternative to z-scores for removing the negative numbers for scores below the mean (see Nunnally & Bernstein, 1994).

In the criterion-related validity study conducted with this organization, the personality subscales demonstrated convergent (.60 and higher) and discriminant (.31 and lower) validity with the International Personality Item Pool scales. Criterion-related validity (uncorrected) was .23 and nearly identical to the .24 uncorrected meta-analytic estimate reported by Frei and McDaniel (1998). The composite internal consistency reliability was .81, with subscale reliabilities ranging from .71 to .79, except for the SJT, which was .47 (typical for SJTs, especially for those with so few items; see McDaniel, Morgeson, Finnegan, Campion, and Braverman [2001]). Although the educational success items may seem out of place, a job analysis indicated they were necessary to assess basic reading and quantitative skills for effective service provision (e.g., operating a cash register). Because we did not have access to the item data, it was impossible to examine whether their inclusion affected the validity of the composite, although inclusion of educational success is consistent with human capital theory (Strober, 1990).

Unit service orientation. We operationalized unit service orientation as the store-level mean of

aggregate individual-level service-orientation KSA scores, nested within each store at each quarter. This aggregation approach to unit service orientation is identical to that used in prior multilevel research on personality homogeneity (e.g., Schneider et al., 1998) and human capital emergence (Ployhart et al., 2006). In these studies (as in ours), the level of theory for unit service orientation was at the unit level but was measured with individual-level KSAs. There were three repeated measures of unit service orientation (quarters 1, 2, 3) for each store. Each quarterly score was the mean service orientation score of all individuals who had applied to *and* were working at a store in a particular quarter. For example, an applicant who was hired in quarter 1 and quit in quarter 3 would have contributed to his/her store's unit service orientation score for quarters 1, 2, and 3. An applicant hired in quarter 2 who quit in quarter 2 would have contributed only to that quarter. Thus, an individual's service orientation score could contribute to a store's unit service orientation score for one to three quarters—an appropriate result, given our focus on unit-mean levels of service orientation.[2]

Bliese (2000) noted that when an individual-level measure is not designed to measure a shared perception (e.g., unit climate), the critical issue is demonstrating sufficient reliability for the unit-level measure. Such was the case here, because the individual-level measure assessed individual differences rather than some common referent such as unit climate or group efficacy (agreement would be necessary for establishing aggregation in the latter case; see Kozlowski and Klein [2000]). Bliese argued that in such instances, the critical issue for testing emergence is not agreement but rather, finding sufficient reliability for the aggregate unit-level means: "The key to detecting emergent relationships is to have groups large enough to produce reliable group-mean values—that is, high ICC(2) values" (2000: 373). Therefore, ICC(2) values for unit service orientation must exceed the .70 minimum threshold. The ICC(2) values for unit service orientation were .87. Although not critical for aggregation in our case, we followed the ICC(1) procedure suggested by Bliese and Ployhart (2002) to estimate the amount of between-store variance in the service orientation scores for all three quarters. This analysis showed that a large percentage (39%, $p < .05$) of variability in unit service orientation over the three quarters was due to between-store differences. We found further evidence of between-store differences in the moderate size of the unit service orientation test-retest correlations. Table 1 shows these and other descriptive statistics for the store-level variables.

Unit effectiveness. We used store productivity, profit, and percentage of sales growth as operationalizations of unit effectiveness because they have theoretical importance and relevance to service contexts, and their use ensures our findings were not metric-specific (the findings between these measures, raw sales, and other variations of sales were nearly identical). We measured all criteria from quarter 2, 2003, through quarter 1, 2004.

The first criterion was *sales per employee.* Service firms frequently use this measure as an index of productivity, and it has been frequently used in past research (e.g., Huselid, 1995). We calculated sales per employee by taking the store's quarterly sales and dividing it by the average number of relevant employee positions for 2003 (provided by the firm). Consequently, calculation of sales per employee was unaffected by turnover because even though there may have been high levels of turnover, the number of positions stayed highly consistent over the year.

The second criterion was *adjusted controllable profit.* Controllable profit represents a store's quarterly sales minus quarterly costs that are, to an extent, under the control of the staff (e.g., labor, utilities). It represents an index of profitability that the store management can be expected to have some control over (and for which they are held accountable). This index has been used by Sacco and Schmitt (2005). However, the studied firm did not want us to present raw values, so we adjusted the controllable profit figures by multiplying them by a decimal constant. This adjustment reduced the controllable profit numbers in consistent ways through all three quarters but had absolutely no effect on distributions, significance tests, standard errors, or the form of relationships (Aiken & West, 1991).

The final store-level criterion was a measure of percentage of sales growth for each store, another commonly used index of retail store effectiveness (Batt, 2002). Often called *same store sales*, it estimates change (expressed as a percentage) in quarterly sales relative to the store's performance in the same quarter of the prior year. The measure essentially uses each store as its own control variable, helping to minimize the effects of between-store differences. This capacity is important theoretically,

[2] Although assigning a unit mean score to represent employees' scores is in some ways similar to having a manager provide a self-report to represent a unit, the unit mean is likely to be more reliable and is based on the actual aggregate human capital instead of a *perceptual* estimate of that capital.

TABLE 1
Descriptive Statistics for Store-Level Variables[a]

	n	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Unit service orientation 1	1,129	54.95	4.09																		
2. Unit service orientation 2	1,226	54.74	2.85	.54																	
3. Unit service orientation 3	1,235	54.50	1.82	.32	.51																
4. Same store sales 2	1,036	0.03	0.09	.00	.02	.07															
5. Same store sales 3	1,036	0.07	0.09	−.01	.00	.04	.83														
6. Same store sales 4	1,036	0.06	0.08	−.03	.01	.01	.55	.77													
7. Adjusted controllable profit 2	1,036	241,934.00	104,891.00	−.04	.05	.02	.17	.09	−.03												
8. Adjusted controllable profit 3	1,036	227,742.00	102,372.00	−.04	.05	.00	.20	.16	.05	.97											
9. Adjusted controllable profit 4	1,036	331,527.00	126,663.00	−.02	.07	.04	.26	.24	.17	.95	.96										
10. Sales/employee 2	1,036	40,304.00	7,220.00	−.02	.06	.05	.17	.08	.00	.54	.53	.51									
11. Sales/employee 3	1,036	40,016.00	7,370.00	−.02	.06	.02	.20	.19	.13	.53	.56	.53	.96								
12. Sales/employee 4	1,036	55,668.00	9,748.00	.02	.08	.07	.28	.30	.32	.35	.37	.46	.85	.87							
13. Unemployment rate	1,202	0.00	1.00	−.01	.02	.05	−.10	−.09	−.02	−.07	−.10	−.09	−.07	−.09	−.08						
14. Store size	1,248	0.00	1.00	−.05	.11	−.04	.08	.02	−.05	.80	.80	.78	.15	.15	−.06	.01					
15. Per capital income	1,186	0.00	1.00	.03	.00	.02	.01	−.03	−.03	.36	.35	.34	.20	.18	.09	−.15	.20				
16. Days	1,248	0.00	1.00	.00	−.05	−.09	−.30	−.25	−.15	−.16	−.16	−.21	.07	.07	.01	.08	−.27	−.09			
17. Retail density	1,174	0.00	1.00	.01	−.01	.03	−.09	−.06	−.03	.25	.26	.22	.14	.15	.05	.08	.16	.12	.09		
18. Turnover rate	1,236	0.63	0.11	.04	.08	.09	−.05	−.06	−.06	.01	.00	.03	.11	.08	.15	−.03	−.20	−.11	.20	.05	
19. Tenure	1,231	0.00	1.00	−.07	−.08	−.05	−.05	−.05	.01	.09	.07	.06	.01	.02	−.06	.01	.12	.09	−.03	−.05	−.17

[a] Correlations of .06 and larger are statistically significant at $p < .05$. Numbers following the variables refer to the quarter of measurement. All variables except same store sales, adjusted controllable profit, sales per employee, and turnover rate are standardized (unit service orientation was converted to *T*-scores at the individual level prior to aggregation).

because as Wright, Gardner, Moynihan, and Allen (2005) showed, controlling for prior unit performance resulted in a near-total reduction in the effects of HR practices on unit performance. Hence, using the same-store-sales criterion produces a very strong internal control. The calculation of same store sales is quarterly sales minus quarterly sales for the prior year divided by the quarterly sales for the prior year. For example, for quarter 3, 2003, same store sales is calculated as (*sales quarter 3, 2003 − sales quarter 3, 2002*)/*sales quarter 3, 2002*.

Unit-level control variables. We used seven control variables to hold constant potential store-level and economic influences. We calculated store *size* by the average headcount of all frontline retail store employees for 2003; store *age* was the number of days the store was open. We obtained the *2003 unemployment rate* for each store's zip code from the U.S. Bureau of Labor Statistics. The *per capita income* (PCI) for each zip code (cf. Sacco & Schmitt, 2005) was obtained by linking the zip code from each store to U.S. Census Bureau databases. Per capita income allowed us to control for whether stores located in wealthier locations showed higher sales. We used *retail density* to estimate the amount of retail competition facing a store. It was created by merging a Census Bureau database containing the number of retail establishments per square mile in each zip code with our store data. Store *turnover* represents the average annual turnover rate in a store for the year (0 = "no turnover"), and *tenure* summarizes the average length of employment for employees in a given store.

Levels of Analysis and Analytic Strategy

The data for this study are longitudinal and nested, such that we are modeling interstore differences in intrastore relationships between unit service orientation and effectiveness. Consequently, it was appropriate to use a random coefficient growth model (RCGM). We built and tested the RCGM using procedures outlined in Bliese and Ployhart (2002). However, unlike growth models in which the independent variable is a time trend (e.g., linear, quadratic), our RCGM capitalizes on the repeatedly measured unit service orientation scores. That is, the independent variable is not time but *flows (changes) in unit service orientation* over time. Specifically, we used a model in which the repeatedly measured store sales criteria (sales per employee, adjusted controllable profit, same store sales) were regressed upon the control variables (measured at a single point in time) and the repeatedly measured unit service orientation measure. The intrastore (level 1) model can be conceptually illustrated as:

$$\Delta sales = \text{intercept} + \text{control variables} + (\Delta unit\ service\ orientation) + (\Delta unit\ service\ orientation)^2.$$

In this model, the dependent variable is change in the sales criteria, and the regression weights are estimates of whether changes in unit service orientation lead to positive (but decreasing) changes in store sales criteria over time (i.e., intrastore changes over time). Note that these regression weights represent the average curve for all stores. The interstore (level 2) model uses variance components to estimate between-store heterogeneity among the intercept and slopes. These variance components represent the variability in the positive but decreasing relationship across stores.

Hypothesis 1 was tested via the statistical significance of the regression weights for the unit service orientation terms. To support a nonlinear (positive but decreasing) curve, not only did both terms have to be significant, but also, the change in unit service orientation term had to be positive and the change in unit service orientation–squared term had to be negative. Hypothesis 2 was tested via the statistical significance of the variance component terms for unit service orientation and unit service orientation squared (we modeled the intercept variance as well, but it was not part of any hypothesis test). Note that the variance component for the linear unit service orientation term estimates variability in the general strength of the linear trend, and the variance component for the squared unit service orientation term estimates variability in the inflection (or "bend") in the curve. Jointly, these variance components test whether the positive but decreasing relationship differs across stores. Because both the linear and squared unit service orientation terms had to be significant to support Hypothesis 1, so too must both variance components be significant to support Hypothesis 2. Hence, Hypothesis 1 tests the shape of the average curve, and Hypothesis 2 tests whether there is between-store variability in the shape of the curve.

Modeling unit service orientation in this way is known as using time-varying predictors (see Singer & Willett, 2003). As Singer and Willett noted, it is important to include a time lag between predictors and criteria when the time-varying predictor is nonmonotonic. Therefore, we set up the model so that the store sales criteria followed unit service orientation temporally by one quarter. Unit service orientation in quarter 1 predicts sales in quarter 2; unit service orientation in quarter 2 predicts sales in quarter 3; unit service orientation in quarter 3

predicts sales in quarter 4. Note that an added benefit of using a lagged model is stronger inferences of causality, because unit service orientation precedes unit outcomes by one quarter (Singer & Willett, 2003). We do not claim this modeling proves causality, but it does allow for stronger causal inferences because it temporally separates the predictors from the criteria. This is not a difference-score model; instead, it is a model that regresses change in effectiveness onto change in unit service orientation.

We entered the control variables first for all analyses, standardized because of their vastly different variances. The one exception was turnover rate, because it only ranged from 0 to 1; hence, 0 has a meaningful interpretation (i.e., no turnover). Unit service orientation was the unit mean of individual scores, which were already standardized via *T*-scores. We did not further standardize it because doing so could have biased estimates of longitudinal relationships (e.g., Rovine & von Eye, 1991). A Toeplitz band–diagonal residual matrix was used to model correlations among the residuals in all models. This type of residual matrix is like a simplex matrix in which the covariances among residuals are estimated in bands, so that the bands closest to the variance diagonal are larger than bands of covariances farther from the variance diagonal.

RESULTS

Descriptive statistics are shown in Table 1. Notice that unit service orientation and the sales criteria appear to be unrelated. We caution readers against making such inferences because aggregate means and bivariate correlations can mask the within- and between-unit variance in longitudinal models (Rogosa, 1995). We emphasize this "lack" of relationships only to highlight the critical difference between the stock and flow of unit service orientation. Also note that, although variability in unit service orientation decreases over time, this effect is not, to our knowledge, to the result of any intervention or change within the organization's policies and practices.

Table 2 shows the results of the RCGM analyses. Hypothesis 1 predicts that the change (flow) of unit service orientation over time relates to changes in unit effectiveness over time in such a way that the positive relationship gets weaker. The regression weights for the unit service orientation terms were both significant for all three criteria, and impor-

TABLE 2
Results of Longitudinal Random Coefficient Growth Models[a]

Variables	Same Store Sales		Adjusted Controllable Profit		Sales per Employee	
Intercept	−1.43*	(0.23)	−1,394,389.00*	(204,665.00)	−234,431.00*	(28,806.00)
Store-level controls						
Unemployment rate	−0.004	(0.00)	−4,356.98*	(2,013.54)	−524.44*	(238.34)
Size	−0.003	(0.00)	110,263.00*	(2,902.34)	230.57	(344.51)
PCI	−0.003	(0.00)	14,319.00*	(2,077.36)	1,020.67*	(246.28)
Days	−0.02*	(0.00)	−3,637.24	(2,181.72)	377.89	(258.80)
Retail density	−0.0002	(0.00)	8,868.42*	(2,178.02)	711.11*	(261.96)
Turnover	−0.04	(0.03)	83,679.00*	(22,238.00)	7,614.86*	(2,642.21)
Tenure	−0.04	(0.00)	−3,283.58	(2,156.65)	−299.39	(255.24)
Predictors						
Unit service orientation	0.06*	(0.01)	60,263.00*	(7,383.94)	10,156.00*	(1,045.23)
Unit service orientation squared	−0.001*	(0.00)	−557.80*	(66.46)	−93.49*	(9.46)
Between-store heterogeneity (variance components)						
Intercept	0.07*	(0.03)	2,456,100,000.00*	(169,840,000.00)	23,556,574.00*	(2,385,197.00)
Unit service orientation	0.00*	(0.00)	814,690.00*	(5,611.00)	7,802.12*	(787.95)
Unit service orientation squared	0.00	(0.00)	267.68*	(18.66)	2.54*	(0.26)
−2 log-likelihood	−7,376.60		74,109.10		62,533.00	
Akaike's information criterion	−7,368.60		74,113.10		62,537.00	

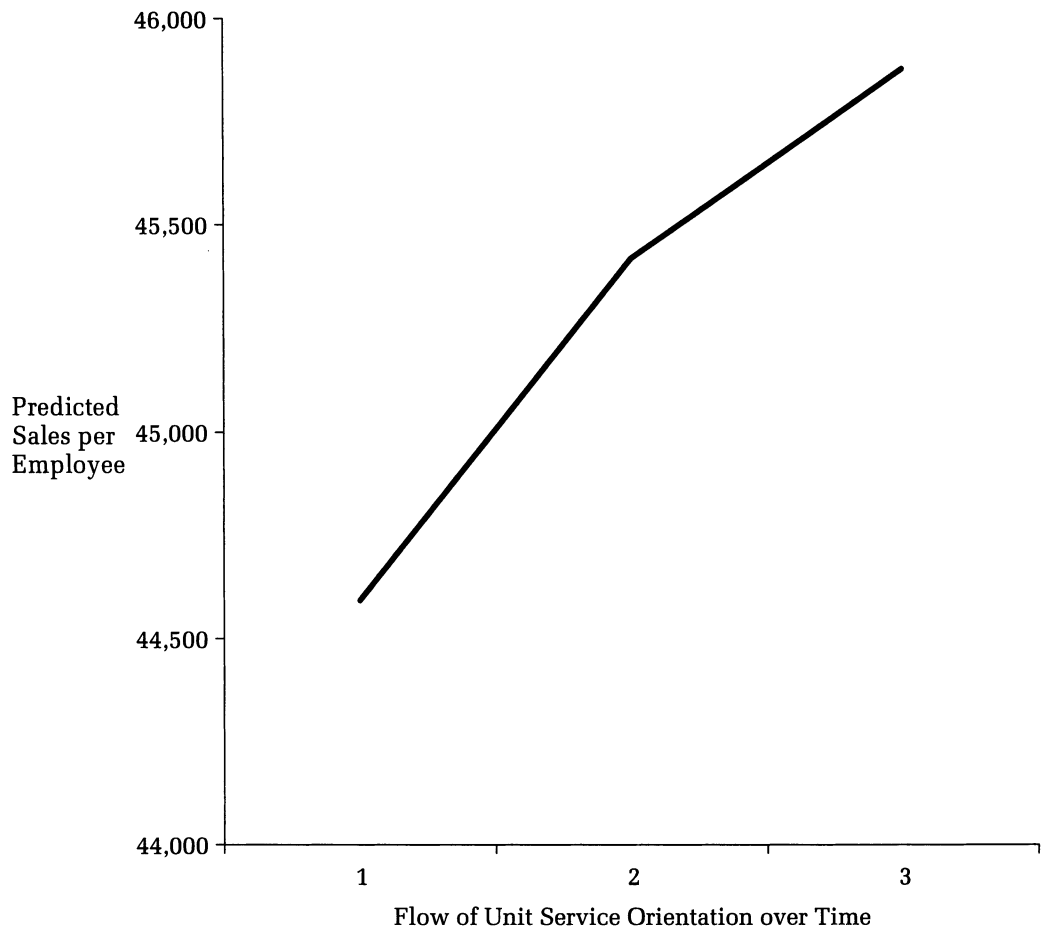
[a] Coefficients for the predictors estimate the longitudinal relationships between changes in the predictors and changes in the criteria. Standard errors are in parentheses. A Toeplitz-banded residual matrix models potentially correlated residuals. All controls except for turnover rate are standardized; unit service orientation predictors are *T*-scores. The variance components are estimated with all control and predictor variables in the model.

* $p < .05$

tantly, the linear terms were positive, while the squared terms were negative (thus producing curves in which the slope gets weaker after a tipping point). For every one-unit increase in unit service orientation, there was (on average) a 6 percent increase in same store sales, a $59,705.20 increase in adjusted controllable profit, and a $10,062.51 increase in sales per employee over time. Using the procedure described in Xu (2003), whereby variance explained is equal to one minus the ratio of mean square error between full and reduced models, the variance explained by the control variables was 5 percent, 56 percent, and 7 percent for same store sales, adjusted controllable profit, and sales per employee, respectively. Change in unit service orientation explained an incremental 8, 2, and 4 percent for each criterion, respectively. Interestingly, the incremental variance explained for unit service orientation was similar to *unconditional* (no control variables) effect sizes obtained at the individual level of analysis. For example, in the Frei and McDaniel (1998) meta-analysis, the variance in individual performance explained by individual service orientation was 6 percent. The presence of a systematic relationship between unit service orientation and sales suggests that variability in unit service orientation is not simply due to chance. Figure 1 illustrates the predicted values for sales per employee. As the figure shows, the relationship between flows of unit service orientation and sales per employee was positive but got weaker over time. Thus, Hypothesis 1 was supported.

To demonstrate further support for Hypothesis 1 and the value of adopting a longitudinal perspective, we performed some supplemental analyses to examine the effects of unit service orientation flows (i.e., the linear and quadratic terms) over the stock of unit service orientation (i.e., average unit service orientation over three quarters). Stated differently, we tested whether the flow of unit service orientation contributed to the prediction of unit effective-

FIGURE 1
Longitudinal Relationship between Unit Service Orientation and Predicted Sales per Employee[a]



[a] There is a one-quarter lag between sales per employee and unit service orientation (with unit service orientation measured in the quarter prior to sales per employee). This figure was produced using predicted values with the control variables at their means.

ness after controlling for the stock of unit service orientation. These analyses regressed unit effectiveness onto the control variables, then the unit service orientation mean, and finally the linear and quadratic unit service orientation terms. In none of these models was the regression coefficient for the mean of unit service orientation statistically significant. Alternatively, in each model the linear and quadratic terms were always statistically significant ($p < .05$) and, on the basis of the Xu (2003) procedure noted above, explained significant incremental variance (ranging from 2 percent to 7.40 percent). These supplemental analyses provided additional support for the proposition that unit service orientation flows, and not simply unit service orientation stock, are related to changes in unit effectiveness.

Hypothesis 2 predicts that the positive, but decreasing, unit service orientation–unit effectiveness relationship is heterogeneous among units, with units manifesting consistently high flows of unit service orientation having greater effectiveness than those with consistently low flows of unit service orientation. The between-store variance components in Table 2 provide general support for this hypothesis. There was significant heterogeneity for both unit service orientation variance components for adjusted controllable profit and sales per employee. For these two criteria, the positive but decreasing relationship with unit service orientation differed across stores. However, for same store sales, only the linear variance component was significant, suggesting that there were only between-unit differences in the linear part of the slope (i.e., there was variability in the linear trend). In general, even when the same HR practices were used in all units, variability in the longitudinal linear relationship between unit service orientation and unit effectiveness was considerable. Unfortunately, there are no conventions as to what constitutes small or large effect sizes for variance components, so we instead illustrate the practical consequences of this heterogeneity. Specifically, we expected that stores with consistently higher flows of unit service orientation would "outperform" stores with lower flows. As an illustration, stores with consistent flows of higher unit service orientation (1 s.d. above the mean) increased their sales per employee by $4,000.00 more per quarter than stores with lower flows of unit service orientation (1 s.d. below the mean). Hypothesis 2 was therefore supported for the adjusted controllable profit and sales per employee criteria.

We conducted additional analyses to examine evidence of other forms of causation. We first examined reverse causation by placing unit service orientation as the dependent variable and the sales criteria as the independent variables. These analyses were also lagged by one quarter. There was no evidence for reverse causation because none of the regression weights was statistically significant ($p > .20$). We also examined whether the results changed by removing the one-quarter lag, so that unit service orientation and unit sales were at the same quarter. The conclusions were identical to the lagged findings (these results are available upon request). As noted by a reviewer, this correspondence of results may suggest that unit service orientation can manifest effects on unit effectiveness in very short periods of time (i.e., less than one quarter). Conversely, the consequences of decreasing unit service orientation are also likely to occur very quickly and possibly in an accelerated manner. Thus, although we saw the effects of unit service orientation extending to at least one quarter, our nonlagged findings suggest that these effects may occur in less time than one quarter.

DISCUSSION

The expectation that human resources contribute to a unit's effectiveness is a cornerstone of both macro (e.g., resource-based theory) and micro (HR, psychology) disciplines of management scholarship. Those in the field of strategic human resource management seek to connect these levels and articulate how human resources relate to firm effectiveness. The purpose of this study was to test several critical, but largely neglected, predictions of resource-based view and SHRM scholarship to demonstrate how changes in the stock and flow of unit service orientation contribute to changes in objective indexes of unit effectives.

First, following recent recommendations (e.g., Gerhart, 2005; Rouse & Daellenbach, 2002), we argued for an expanded interpretation of human capital, one based on aggregate knowledge, skills, and abilities theoretically linked to unit effectiveness in specific contexts. We found that a retail unit's service orientation represents a resource capable of producing change in unit effectiveness. Our examination of unit service orientation provides a nice complement to prior service research, which has focused on employee job attitudes and climate perceptions (Schneider et al., 1998). Importantly, unit service orientation is not based on inferences from HR practices or proxy measures, but is measured directly via the aggregation of employee KSAs. Besides being more consistent with the underlying theory of a strategic resource, direct measures of aggregate KSAs may offer additional benefits, such as better reliability and construct validity (Gerhart,

2005; Wright & Haggerty, 2005). Further, measures of aggregate KSAs are likely necessary to study human resource accumulation (e.g., Helfat & Peteraf, 2003), including changes to stocks and flows, because HR practices or proxy measures may not change over time. For example, although HR practices may not change very often, the effects those practices have on employee attitudes, cognitions, and behaviors may be highly variable (Bowen & Ostroff, 2004).

Second, we demonstrated that changes in the flow of unit service orientation related to changes in unit effectiveness over time. Although many have suggested longitudinal research is necessary to advance SHRM scholarship (e.g., Gerhart, 2005; Wright et al., 2001), cross-sectional studies dominate the empirical literature. This study is unique in that it shows how the *flow* of unit service orientation contributes to changes to unit effectiveness over time (Dierickx & Cool, 1989). Thus, our empirical tests shed new light on some of the reasons why human resources may be inimitable: the difficulty in creating a critical mass of high-quality employees occurs because of the difficulty in maintaining a consistent flow of quality unit service orientation. Although building a high-quality stock is important, the key driver of unit effectiveness *over time* is the flow of human resources. Of course, we did not identify why unit service orientation changed in the first place. This change may result from changes in the quality of the recruiting pool, the quality of hiring decisions (e.g., weighting of test and interview scores), or other factors we could not identify. Future research should examine how unit service orientation emerges by isolating the effects of unit service orientation from these other potentially important determinants.

Finally, we found that the relationship between the flow of unit service orientation and unit effectiveness was positive but decreasing over time and heterogeneous among units. Drawing on the resource life cycle (Helfat & Peteraf, 2003) and prior customer-service research (e.g., Liao & Chuang, 2004; Lovelock & Wirtz, 2004; Mattila, 2001; Schneider et al., 2007), we argued that units with flows of higher-quality unit service orientation will generate more new customers and more repeat customers, who will shop more frequently and purchase more on subsequent visits. This cycle creates a positive but decreasing relationship between unit service orientation and unit effectiveness, because sales are likely to accelerate to a tipping point, and then start to weaken (yet remain positive) (Reichheld & Sasser, 1990). Of course, we did not find significant heterogeneity for the squared term with the same-store-sales criterion. Because same store sales essentially controls for a store's prior performance, it may have the effect of reducing the magnitude of curvilinear changes, which would in turn reduce the size of relationships found with unit service orientation. Alternatively, it may be that for this criterion, changes in unit service orientation do not produce accelerated sales beyond a straight linear relationship. Future research should examine this possibility with other samples and industries.

Theoretical Implications

This study has broad theoretical implications for SHRM scholarship, resource-based theory, and customer-service scholarship. First, our study offers several new directions for SHRM scholarship. As others before us (Bowen & Ostroff, 2004; Gerhart, 2005; Wright & Haggerty, 2005), we believe it is important for SHRM to take a broader perspective on human capital and consider other types measured via aggregation of employee KSAs. This view does not argue against the importance of traditional conceptualizations of human capital, but supplements it. For example, Rouse and Daellenbach (2002) noted that macro scholars should "work backwards" from criteria and identify the specific types of resources likely to be important in a given context. Interestingly, such a perspective has long been held in micro HR, as Wallace (1965) noted that predictors derive their importance from criteria. Micro HR scholarship recognizes many potentially important KSAs, such as motivation, personality, and more refined types of knowledge and skill, than does traditional human capital research. Thus, we suggest an integration of micro and macro research to examine the manifestations and consequences of different types of human capital. One possibility is to link HR practices and policies, forms of human capital, and unit outcomes in a single study. For example, *different* practices should create *different* compositions of human capital and hence differences in unit performance. Examining human capital in this manner may contribute to better measures of "intangible resources" and help illuminate the "black box" that plagues SHRM research (Becker & Huselid, 2006).

This study offers several new directions for resource-based theory. One key implication is that although accumulating a high-quality stock of human resources is important for increasing unit effectiveness, it is even more important to control the flow of talent (Barney & Wright, 1998; Wright et al., 2001). This finding provides some preliminary support for recent theory predicting resources and capabilities are dynamic, and perhaps even for the

idea that a resource cannot be a source of sustained competitive advantage without additional inputs (Helfat & Peteraf, 2003). That is, without continual reinvestment in or renewal of the resource, it will eventually cease to be a source of competitive advantage. Recognizing the importance of resource flows requires future research to study how resources are created and evolve over time. For example, it becomes critical to understand which HR practices most influence flow in the quickest and most efficient manner. Understanding resource emergence is critical for testing resource-based theory in a prescriptive manner (Helfat & Peteraf, 2003).

The fact that unit service orientation manifests a positive but decreasing relationship with unit outcomes, and that this relationship is largely heterogeneous among units, also stimulates many research questions. For example, if the flow of resources manifests nonlinear relationships with unit outcomes, then it becomes important to understand why the relationship is nonlinear, and whether other resources manifest similar nonlinear relationships. In our study, we expected positive but decreasing sales over time, because firms with higher-quality human resource flows produce more satisfied customers that shop more and spend more money (Lovelock & Wirtz, 2004; Reichheld & Sasser, 1990; Schneider et al., 2005). Obviously, the nonlinear function may differ across types of resources and contexts. For example, human resources may show weaker slopes in industries dominated by more tangible forms of capital (e.g., manufacturing), but may show stronger slopes in industries where there is a more intimate relationship between service providers and customers (e.g., law firms). Likewise, the lag between the time when the resource reaches a high-quality stock and the time when changes in unit effectiveness occur may be resource and context specific. Barney (1991) argued that strategic resources are context-specific and dependent on the unit's strategy, which helps explain the heterogeneity in unit service orientation–unit effectiveness relationships we observed. Integrating context and strategy with human resources could prove to be very interesting. For example, one may question whether the generalizable relationships found for KSA predictors of individual-level performance would be generalizable at the unit level. Similarly, future research should examine why there was heterogeneity in the positive but decreasing unit service orientation–unit effectiveness relationship. Such heterogeneity may be caused by differences in units' strategies, their ability to leverage the capital or combine it with other resources, managerial practices, and related internal factors (e.g., Barney, 1991). Indeed, managers who better recognize the strategic value of unit human capital are more likely to leverage it and hence extract more value more from it (Carmeli & Schaubroeck, 2005; Hitt et al., 2001). Alternatively, heterogeneity may be due to external reasons, such as a unit's reputation and brand equity, local competition, and similar contextual factors.

Finally, this study has implications for the customer service literature because most prior unit-level service research has focused on either shared employee attitudes and perceptions or manager competencies (see Schneider & White, 2004). Neglected in this literature is the actual *aggregate* competence of a service unit's workforce—a striking area of neglect, considering that service employees are core employees and fulfill key "boundary-spanning" roles (Batt, 2002). Research should now consider how aggregate service orientation, attitudes, climate, satisfaction, and sales are related. For example, climates not supportive of service may nullify the positive potential of unit service orientation, because service behaviors are not perceived to be valued.

Of course, not all human resources will be as volatile as those in the retail industry, and we would not expect human resources to always relate to unit effectiveness. For example, in industries that are less affected by human capital, such as agriculture and manufacturing, human resources may be more substitutable. The human capital–unit effectiveness relationship may also be stronger or weaker under different types of HR configurations (e.g., Bamberger & Meshulam, 2000) or different jobs. Similarly, retail firms could choose to use process-based strategies in an attempt to replace human capital (see Bamberger & Meshulam, 2000). We remind readers that enhancing human capital is not free. There are costs associated with acquiring and retaining human capital, and utility models are helpful for understanding these costs (Sturman, Trevor, Boudreau, & Gerhart, 2003).

Managerial Implications

Many in the retail industry are skeptical about the value of investing in frontline service employees. The argument is that with high turnover and few apparent differences among applicants, HR should simply use the "cheapest way of getting warm bodies." Such is the "value challenge" facing HR more generally (Barney & Wright, 1998). The present study offers an empirical response to such criticism. First, it presents an alternative way to estimate unit service orientation's value to a firm

by demonstrating the relationships at the unit level, on which most managers focus, and by linking it to the kinds of criteria managers attend to and are held accountable for (Ployhart, 2006). Notice that this is not a replacement for utility analysis, but a supplement to it—perhaps even a way to explain it. Utility analysis is an attempt to estimate the dollar value associated with individual employee competencies. This estimate is important but can be challenging to calculate or to convey to managers. The approach adopted in this article offers an alternative perspective that may help pinpoint the economic value of HR interventions. Indeed, it is argued that the reason SHRM scholarship has been impactful is precisely because it defines the level of analysis as the business unit, and the dependent variables are usually financial (Gerhart, 2005).

Thus, the practical implications of this study are much more than simply noting that unit service orientation is important. One key implication is that organizations should strive to develop and maintain a *critical mass* of high unit service orientation. Applying an HR practice from the "high-performance work system" bundle is not enough; managers must monitor and evaluate the practice's consequences at the unit level. Sustainable competitive advantage may come not from the use of a particular HR practice, but from management's ability to effectively apply the practice (in coordination with relevant dynamic labor conditions) to accumulate and maintain a stock of talented employees. As this study shows, considerable variability can exist even within the same firm. Managers must realize it will take time for unit service orientation to emerge and produce unit-level effects.

Limitations

Such a large longitudinal field study offers several challenges, and our approach has limitations that should be addressed in future research. First, our study was conducted within a single industry and firm. Even with seven control variables, we cannot eliminate the possibility that some stores differed from others in ways we could not model. Relatedly, our use of stores that varied in naturally occurring ways (no extreme groups) and all used the same HR practices may have resulted in conservative tests of our hypotheses, and we urge other researchers to replicate our study with different samples, industries, methods, and contexts. Doing so is particularly important, because unmeasured variables may account for some of our findings. For example, we had to use a rough measure of retail density, yet various forms of retail competition (for talent or customers) may have exerted influences in ways we could not assess.

Second, although the stores used identical HR practices, and managers were expected to implement those practices identically, it may be possible that some managers did not implement the practices appropriately. This of course relates back to the distinction between HR policies as guiding principles for a firm and HR practices that are actually implemented on employees. However, it must be remembered that our study focused on aggregate KSAs instead of manager self-reports. Much of the concern with using HR manager self-reports is that they can describe HR policies but not necessarily how HR practices are actually implemented (Arthur & Boyles, 2007; Gerhart, Wright, & McMahan, 2000). Our study directly examined aggregate KSAs, so any discrepancies between guiding HR policies and the practices actually administered should contribute to more between-store variability in unit service orientation, as Bowen and Ostroff (2004) predicted. One might argue that directly studying employee KSAs is a potentially useful way to assess the consistency between HR policies and practices, as well as address other issues with self-reports (see Arthur & Boyles, 2007; Gerhart, 2005; Gerhart et al., 2000), although this is a question for future research.

Third, we modeled unit service orientation for jobs of relatively low complexity, and within a service environment. Theoretically, one might predict similar results in other industries and for other types of constructs (e.g., cognitive ability), but the fact remains that until such data are available, one should be cautious about generalizing our findings to different contexts, jobs, and KSAs. Fourth, we were only able to analyze the overall service-orientation composite. Because the organization did not use the subscales for selection, we were unable to examine whether these different KSAs might have had different relationships with store sales (e.g., conscientiousness may have exhibited different relationships than agreeableness). However, please recognize that the service-orientation composite was assessed in a manner consistent with prior research, the items were chosen to measure the service-orientation composite, and the cut score was based on the composite. Fifth, we were not able to capture interview scores or identify whether interviewers considered the service-orientation scores when making hiring decisions (although all applicants had to participate in both assessments). That said, the key issue for the present study is demonstrating whether changes in unit service orientation relate to changes in unit effectiveness, so between-store variability in interviewer practices

should only contribute to more between-store variability in unit service orientation. Sixth, although the study was longitudinal, the data were only modeled over a three-quarter period. This period is longer than that used in most prior research, but it would be helpful to examine even longer time frames. Including the predictors in the quarter prior to the criterion strengthens inferences of causality, but stronger inferences of causality require longer periods of time. Future research should test different lags between unit resources and unit effectiveness using different types of resources, contexts, and data. Too long or too short a lag may obscure dynamic relationships. Studying issues relating to the duration and timing of unit resource effects would provide great precision in understanding how resources contribute to unit effectiveness and enhance knowledge of the resource life cycle (Helfat & Peteraf, 2003). Finally, we modeled employees as being part of a unit's service orientation, even if they worked only a short period of time. Future research might benefit from finer-grained analysis of the relationship between length of employment and human capital's consequences.

In conclusion, this study presents important evidence that unit service orientation can be a determinant of unit effectiveness. We believe a more direct focus on human capital operationalized as aggregate KSAs may connect micro and macro disciplines and levels of scholarship. Human capital is critical to the effectiveness of business units, firms, and even nations. It is incumbent on scholars in all disciplines to better understand the creation and consequences of this vital resource.

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