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Research Article

Which comes first, organizational culture or performance? A longitudinal study of causal priority with automobile dealerships

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Summary Prior research supports a link between organizational culture and performance but generally falls short of establishing causality or determining the direction of a culture–performance (C-P) relationship. Using data collected from 95 franchise automobile dealerships over 6 years, we studied longitudinal culture–performance relationships to determine whether culture or performance has causal priority, or alternatively, whether a reciprocal relationship exists. Results from cross-lagged panel analyses indicate that culture "comes first," consistently predicting subsequent ratings of customer satisfaction and vehicle sales. Furthermore, the positive effect of culture on vehicle sales is fully mediated by customer satisfaction ratings. Copyright © 2014 John Wiley & Sons, Ltd.

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Organizational culture has long been described as a driver of firm performance, from its earliest mentions in the research literature (Jaques, 1951; Pettigrew, 1979) to a number of popular press books (e.g., Ouchi, 1981; Peters & Waterman, 1982). Despite early reviews that were mainly critical of empirical culture–performance (C-P) research (Rousseau, 1990; Siehl & Martin, 1990), evidence has accumulated that an association does exist and that certain features of organizational culture are routinely correlated with a range of organizational performance outcomes (e.g., Hartnell, Ou & Kinicki, 2011; Sackmann, 2011). However, research to date has generally fallen short of establishing a causal *culture-to-performance* effect. Alternatively, it is possible that organizational performance causes organizational culture, culture and performance are reciprocally related, or both are caused by a third variable.

Given the unique theoretical and practical implications of these alternative forms of a C-P relationship, the question of causal priority is of fundamental importance. In lieu of closely controlled experimentation, longitudinal C-P studies are necessary to tease apart causal priority and rule out alternative explanations, as well as to more fully understand the *timing* of C-P relationships. In her recent review of the C-P domain, Sackmann (2011) identified only six longitudinal studies among the 55 total studies published. Importantly, none of these studies provided an explicit test of reverse or reciprocal causality.

To address these shortcomings, the present study uses a longitudinal design that spans 6 years and includes multiple waves of culture and performance data for sales and service departments within 95 automobile dealerships. By studying the pattern of C-P relationships over successive years, this study provides two important contributions. The first is *causal priority*: Is department culture an antecedent of performance outcomes over time? This is a

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fundamental, yet untested, assumption of existing culture theory and practice. If culture is not an antecedent of performance, then existing theoretical assumptions require revision and firms would be well advised to direct their limited resources away from explicitly building a positive culture and toward interventions directly impacting firm performance. To date, this question has not been appropriately examined longitudinally.

The second contribution involves the *timing* of C-P relationships: Over what time period (or delay) do predictive relationships emerge? Despite general agreement that organizational cultures tend to evolve slowly over time, current theory and research are largely silent on the temporal lags of C-P relationships (Schein, 1985). This gap in understanding has unfortunate practical and scholarly implications. Practitioners may not fully understand or appreciate the time it will take for culture improvements to demonstrate a return on investment for various performance outcomes. With limited insights into time horizons, it will remain difficult for practitioners to compare culture interventions with other management tools and strategies. In empirical research, inferences about the substantive nature of C-P relationships must be considered in the context of the time lags investigated. Absent a well-reasoned and tested theory (of which we are not aware), it will be particularly difficult to evaluate null findings in future C-P studies, particularly those studies set within one specific time frame or lag.

Prior to discussing the current study in greater detail, we first introduce several key theoretical perspectives bearing on the C-P directionality issue, followed by a brief review of the longitudinal studies from this domain.

The C-P Link: Theory and Empirical Observations

In describing the basis for a C-P link, one must first acknowledge a certain degree of definitional ambiguity surrounding the organizational culture construct (Verbeke, Volgering & Hessels, 1998). Despite this ambiguity, various definitions generally reflect a focus on the values, beliefs, and assumptions that are held by the employees of an organization and which facilitate shared meaning and guide behavior (e.g., Hofstede, Neuijen, Ohayv & Sanders, 1990; Schein, 1985). Consistent with our purpose, this study focuses primarily on the norms, values, and practices that are observable and, therefore, measurable manifestations of an organization's culture (Ashkanasy, Broadfoot & Falkus, 2000).

Wilderom, Glunk, and Maslowski (2000) indicated that a major challenge facing researchers is the "establishment of a theoretical basis for explaining the assumed [C-P] relation" (p. 205). Although no comprehensive theory has emerged, two perspectives particularly relevant to the causal directionality issue are the process-oriented models that describe how organizational cultures come to be (e.g., Schein, 1985) and the resource-based view of the firm (Barney, 1986, 1991).

Process-oriented models. Process-oriented models follow from culture's anthropological origin by focusing on cultural dynamics and interpretation (Hatch, 1993; Martin, 1992). Several researchers have described culture as adaptive and laid the groundwork for a reciprocal C-P relationship. Perhaps most notable is Schein's (1985) classic description of the evolution of culture across the organizational life cycle. Schein proposed that early in the life cycle, culture mainly reflects the values of the founding leader. Subsequently, these values are challenged as the organization struggles to adapt and respond to internal and external problems. Over time, the values that enhance the organization's responsiveness are passed on to "new members as the correct way to perceive, think, and feel in relation to those problems" (Schein, 1985, p. 9), and a set of fundamental beliefs and assumptions become deeply engrained, reflecting the cumulative lessons learned.

Thus, the life cycle process described by Schein (1985) supports the idea of a reciprocal C-P relationship, with firm effectiveness and survival serving as a feedback loop (Sackmann, 2011; Wilderom et al., 2000). However, there are a few noteworthy factors that may limit the influence of the feedback loop. First, attribution theory and research suggest that individuals are motivated to attribute their failures, and those of the groups to which they belong, to external rather than internal factors (Kelley, 1971). This suggests that culture change is unlikely to occur unless the people in the organization view the culture as part of the problem. Second, Schein describes how the ability

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to change the culture becomes constrained as the organization reaches maturity. And third, characteristics of the culture itself can lead to change resistance (Hofstede, 2001). Together, these factors suggest ways in which an organization's momentum may constrain a performance-to-culture feedback loop and, by extension, weaken the strength of a reciprocal relationship. Nonetheless, the potential for the dynamic interplay of culture and organizational effectiveness is foundational to a process-oriented perspective.

The resource-based view. Barney (1986, 1991) described three conditions that are required for organizational culture to have a causal impact on firm profitability. First, the culture must be valuable to the firm by allowing it to behave in ways that facilitate a higher degree of effectiveness than competitors. Second, it must be rare. No advantage is conferred if the culture is commonplace among the firm's competitors. Third, it must be imperfectly imitable, such that competitors cannot readily re-create the culture in their own organization. In other words, cultures that are valuable, rare, and not easily replicated can facilitate superior performance. Thus, a resource-based view clearly positions culture as a causal antecedent of performance outcomes, provided that certain conditions are met.

Culture content. One approach to articulating how culture contributes to organizational effectiveness has been to focus on the content of cultural values and norms (Saffold, 1988). Although a number of scholars have developed influential trait-based frameworks comprising various dimensions of culture (e.g., Hofstede et al., 1990; Quinn & Rohrbaugh, 1983), only a subset focus specifically on the C-P link, and even fewer have a strong theoretical basis (Ashkanasy et al., 2000). One of the exceptions is Denison's model of cultural effectiveness, which provides the framework for the current investigation.

Denison and colleagues' theory proposes that the most effective organizations are characterized by a strong *mission* and high levels of employee *involvement*, *internal consistency*, and *adaptability* (Denison & Mishra, 1995). Employee *involvement* is the extent to which the organization encourages empowerment, team-based cooperation, and individual learning and development; internal *consistency* is the degree to which there exists a clear set of espoused values, agreement about values, and inter-departmental coordination that arises from this common and agreed upon set of values; *adaptability* represents the degree to which the organization is focused on learning from its competitors and customers and promotes flexible and adaptive responses at both the organizational and employee levels; and finally, *mission* regards the extent to which the organization has a clearly articulated strategic direction that provides context for action and goals against which progress can be tracked.

According to Denison's theory, effective organizations have all of these cultural traits, and the balancing and simultaneous pursuit of the competing demands these values represent is critical to organizational effectiveness. Indeed, the most effective organizations have high levels of each trait, or a "full profile" (Denison, Nieminen & Kotrba, 2014). In support of the theory, positive correlations between the traits and a range of effectiveness criteria have been demonstrated in a variety of organizational, industry, and national contexts (e.g., Fey & Denison, 2003; Gillespie, Denison, Haaland, Smerek & Neale, 2008; Yilmaz & Ergun, 2008).

Indirect longitudinal evidence

Considering the dynamic interplay of culture and organizational effectiveness from the process-oriented perspective as well as the direct causal role of culture ascribed by the resource-based view, there is adequate rationale for proposing both direct *and* reciprocal C-P relationships over time. Unfortunately, no studies that we are aware of have assessed organizational culture and performance repeatedly over time with an explicit test of their relationship. However, indirect evidence regarding the timing and nature of C-P relationships can be gleaned from two sources.

One form of indirect evidence can be drawn from the handful of studies that have quantitatively tested C-P relationships using time-lagged effectiveness criteria. Most research suggests that the magnitude of C-P relationships remains stable or increases slightly within a 1- to 6-year period following culture assessment (Denison & Mishra, 1995; Gordon & DiTomaso, 1992; Zahra & Covin, 1995). However, Petty, Beadles, Lowery, Chapman and Connell (1995) reported a slight decrease in the positive effects of cultural variables on performance after a 1-year delay.

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Because these studies assessed culture only once, their findings provide relatively limited insights into the dynamic nature of C-P relationships over time and provide no test of reverse or reciprocal causality.

A second form of indirect evidence comes from longitudinal case studies, which follow organizations as they undertake a culture transformation and document subsequent improvements in objective and subjective performance indicators (e.g., Fairfield-Sonn, 1993; Frame, Nielsen & Pate, 1989; O'Regan & Lehmann, 2008). The generalizability of these findings is difficult to establish given the focus on one particular organizational context. Also, because the majority of case studies focus on organizations undergoing effortful culture transformation, it is further unsurprising that these studies have focused little attention on the possibility of reverse or reciprocal C-P relationships. Two exceptions include case studies by Sackmann, Eggenhofer-Rehart, and Friesl (2009) and Bititci, Mendibil, Nudurupati, Garengo, and Turner (2006), both of which describe the dynamic nature of C-P relationships over time.

In summary, the existence of a C-P relationship is relatively well established after 30 years of theoretical and empirical developments, but with a still tenuous basis for staking a causal claim or asserting directionality. No study that we are aware of has conducted an explicit test of the process-oriented view of culture and performance as reciprocally related, nor has any study adequately tested the alternative possibility that performance causes culture, not vice versa (Siehl & Martin, 1990). Failure to consider directionality and the timing of C-P relationships is an important deficit in the literature, with substantial theoretical and practical implications.

The present study

This study investigates C-P relationships over a multi-year period within the sales and service departments of franchise automobile dealerships. The dealerships carried the same products and used the same performance metrics but nevertheless were owned and operated independently. Consistent with an *integration* perspective, culture was conceptualized as a shared phenomenon at the department level (Martin, 1992). Although this may overlook important cultural dynamics at higher or lower levels of the dealerships, we chose to focus on departments because they operate fairly independently within the dealerships and because the employees within these groups work together as a team and share common performance objectives. Moreover, statistical tests (see succeeding discussions) supported aggregation of individual perceptions of culture to the department level. C-P relationships were tested using a series of cross-lagged panel analyses. The performance variables investigated were vehicle sales (sales departments) and customer satisfaction (sales and service departments).

Hypotheses

On the basis of our review of the C-P literature, we expected that department culture would have an effect on both customer satisfaction and sales. Denison's research has shown that organizations with higher mean levels or *intensity* (Chatman, 1989) of cultural values and norms in each of the four traits—involvement, consistency, adaptability, and mission—tend to be more profitable and have higher sales growth (e.g., Denison, 1984; Denison & Mishra, 1995), more favorable customer satisfaction ratings (Gillespie et al., 2008), and higher subjective ratings of firm effectiveness (Fey & Denison, 2003; Denison et al., 2003). Moreover, these same themes are reflected in a number of additional studies characterizing the cultural context of high performing organizations in the service and sales sector (e.g., Lee, Yoon, Kim & Kang, 2006; Petty et al., 1995; Ryan, Schmit & Johnson, 1996; Schneider, White & Paul, 1998).

This research suggests broadly that an effective departmental culture is characterized by high overall levels of involvement, consistency, adaptability, and mission. Accordingly, we expected the *overall culture of a department*, as indexed by its mean level across traits, to be positively related to its customer satisfaction ratings and vehicle sales over time. In this study, we define *causal priority* as the relative strength of the directional relationships (culture-to-performance vs. performance-to-culture) rather than the total absence of a reverse effect (performance-to-culture). Therefore, we hypothesized that the overall culture of a department is a stronger predictor of subsequent performance than vice versa.

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Hypothesis 1: In sales and service departments, the department culture has causal priority over customer satisfaction.

Hypothesis 2: In sales departments, the department culture has causal priority over vehicle sales.

As described earlier, the process-oriented view of culture draws attention to the evolution of a culture in response to the organization's successes and failures. As highlighted by the longitudinal case studies reviewed previously, and indirectly supported by two empirical studies from the climate for service domain (Ryan et al., 1996; Schneider et al., 1998), it is likely that performance outcomes operate as a feedback loop for subsequent culture change. We therefore advanced the following hypothesis, noting that the occurrence of a reverse performance-to-culture relationship is *not* mutually exclusive with the hypothesized causal priority of culture.

Hypothesis 3: In sales and service departments, the department culture and performance (i.e., vehicle sales and customer satisfaction) are reciprocally related over time, as evidenced by a positive performance-to-culture feedback loop.

In addition to the issue of causal priority, we also sought to test the role of customer satisfaction as a mediator of the C-P relationship in sales departments. Prior studies demonstrate that customer satisfaction is a key factor in the performance of service-oriented organizations and is closely linked with sales performance. This is because satisfied customers are more likely to make repeat purchases (Grewal & Sharma, 1991) and spread positive word-of-mouth about the organization (e.g., Maxham, 2001; Terblanche, 2011), both of which have crucial implications for future sales. Repeat purchases comprise an important part of the total new automobile sales market (Verhoef, Langerak & Donkers, 2007), and word-of-mouth likely impacts both the number of new customers entering dealerships and purchasing behavior thereafter (Söderlund, 2002). Given the well-documented linkages between culture and customer satisfaction (e.g., Ford et al., 2008; Lee et al., 2006) and the anticipated role of customer satisfaction in future vehicle sales, we therefore proposed the following.

Hypothesis 4: In sales departments, customer satisfaction mediates the relationship between the department culture and vehicle sales.

Method

Sample and procedure

Over a 6-year period (2000–2005), complete data were collected from 95 franchise automobile dealerships selling and servicing vehicles by the same manufacturer. All dealerships were located in the United States. These dealerships met the following inclusion criteria: they (i) participated in all four rounds of culture surveys, (ii) had a minimum of three survey respondents from each department, and (iii) had customer satisfaction and vehicle sales data across all 6 years. Both culture and performance were operationalized at the level of departments—sales or service—within each dealership.

For analytic purposes, the variables were aligned to six time points separated by approximate 1-year intervals. Culture surveys were collected four times, starting in the first quarter (Q1) of 2000 and subsequently in Q4-2001, Q4-2002, and Q4-2004. On the basis of the timing and availability of the performance variables, these surveys corresponded most closely to time points T1, T3, T4, and T6, respectively. Whenever possible, the customer satisfaction ratings and vehicle sales for each time point were derived as the mean across the two quarters preceding and

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following each survey administration. All years were represented, with the exception that no vehicle sales information was available for 2002.

Culture surveys were administered in paper-and-pencil in 2000 and 2001 and online in 2002 and 2004. All employees in the sales and service departments received an invitation to complete the survey during normal working hours. Participation was voluntary, and respondents were ensured that their responses would be kept anonymous. For sales departments, the average number of employees completing the survey was 13 (range 3 to 42). For service departments, the average number was 32 (range 4 to 131). No information on the demographics of respondents or response rates within the dealerships or departments was available.

Customer satisfaction surveys were mailed to all customers purchasing or servicing a vehicle. Each quarter, an average of 41 and 85 surveys were returned to sales and service departments, respectively, yielding response rates of approximately 50 and 35 percent.

Measures

Culture survey

Department culture was assessed using the Denison Organizational Culture Survey (DOCS). The DOCS assesses four primary cultural traits described earlier: involvement, consistency, adaptability, and mission. In total, the survey consists of 60 items (15 items per trait), each of which uses a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Prior studies have supported the DOCS factor structure with the four cultural traits as second-order factors and demonstrated acceptable levels of internal consistency for the 15-item sub-scales (e.g., Denison et al., 2014). In the present study, Cronbach's α across time and departments was .94 for involvement, .94 for consistency, .92 for adaptability, and .96 for mission.

In order to justify aggregating individual ratings of culture to the department level, it is first necessary to demonstrate adequate levels of within-group agreement ($r_{wg(j)}$), inter-rater reliability (ICC1), and group mean reliability (ICC2; Bliese, 2000). Because the ratings of culture traits demonstrated a negative skew, $r_{wg(j)}$ was computed on the basis of a uniform null distribution and again on the basis of a slightly negatively skewed null distribution (LeBreton & Senter, 2008). Across years, departments, and traits, the median $r_{wg(j)}$ ranged from .78 to .96, exceeding the .70 criterion recommended as adequate evidence for aggregation (Lance, Butts & Michels, 2006). Inter-rater reliability (ICC1) corresponds to the percentage of total variance in cultural ratings that can be attributed to group membership (Bliese, 2000). James (1982) reported a median ICC1 of .12 across studies from the organizational literature, and Bliese indicated that values between .05 and .20 have typically been deemed acceptable. In the present study, ICC1 ranged from .11 to .19. The reliability of group means (ICC2) also provided adequate support for aggregation, with values ranging from .67 to .85 across years and departments. These results provide sufficient justification for aggregating individual ratings of culture to the department level. In addition to statistical justification, we note briefly that our focus on separate departments as the unit of analysis is justified by two additional considerations: (i) the dependent variables measured are specific to department type (see succeeding discussions); and (ii) sales and service departments are intact subgroups with different people (sales staff vs. mechanics) completing different types of work (selling vs. fixing automobiles).

Consistent with our focus on investigating department culture as an antecedent of performance outcomes, we derived an index of overall department culture by taking the mean across all four culture traits. Although this approach is not sensitive to potential differences at the trait level, this decision was made in light of several key considerations. First, prior research indicates that the traits tend to be moderately-to-strongly positively correlated. In the present study, trait correlations were generally high (i.e., .89 to .96 with a mean of .93). Second, the statistical complexity of the tested models precluded use of a multidimensional approach in which the effects of the four cultural traits could be simultaneously modeled. Finally, we note that separate analyses for each culture trait (following the same analytic strategy reported later) revealed an overall pattern of findings that was both consistent across traits and consistent with the overall culture results reported here. As a set, the trait-level analyses resulted in exactly 300

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model tests, for which only eight minor model-fitting differences were observed across the four traits. Further, a comparison of path coefficients from the final models did not identify a pattern of unique C-P relationships by trait or in comparison with the overall culture results. Full details on the trait-level findings are available from the authors upon request.

Customer satisfaction

Mean ratings on a single customer satisfaction survey item were available on a quarterly basis for each sales department: "Based on your overall purchase/lease and delivery experience, how satisfied are you with *XYZ Dealership*." Similar mean customer responses to a single item were available for each service department: "Based on this service visit overall, how satisfied are you with *XYZ Dealership*?" Customers rated their satisfaction using a 4-point scale, ranging from 1 = *not at all satisfied* to 4 = *completely satisfied*. Although the use of a single-item customer satisfaction indicator is not ideal, there is some evidence in support of the reliability of single-item measures (Wanous, Reichers & Hudy, 1997).

New vehicle sales

The number of new vehicle sales for each dealership was available on a quarterly basis. On average, the dealerships included in this study sold approximately 93 vehicles (median = 77) each quarter, with sales increasing slightly over time. In order to account for a strong negative skew, sales data were logarithmically transformed prior to analyses.

Control variables

Department size and economic conditions were investigated as potential control variables. The average number of respondents from each department was used as a proxy for department size because all employees were strongly encouraged to complete the culture surveys and the actual number of employees was not available. Department size was consistently correlated with the number of new vehicle sales (ranging from $r = .18$ to $r = .27$), so we controlled for it in all analyses involving vehicle sales. Although it was plausible that department size could also affect customer satisfaction, this was not the case in the present study (Table 1). Thus, we did not control for department size in analyses involving satisfaction. We also investigated the role of local economic conditions (i.e., unemployment rates) and found they were unrelated to sales or satisfaction, so they were not included as controls.

Analytic strategy

The analytic strategy compared models with increasingly strict assumptions about the underlying relationships among variables, with the best-fitting model from each stage serving as the initial comparison model for the next stage. Following Hu and Bentler's (1999) recommendation, model fit was assessed using the following criteria: SRMR ≤ 0.08 (and RMSEA ≤ 0.06 *or* CFI ≥ 0.95). Comparisons between nested models were assessed with the chi-square difference test. All models were estimated using AMOS 7.0. Separate analyses were conducted for service departments-satisfaction outcomes, sales departments-satisfaction outcomes, and sales departments-sales outcomes. The timing of C-P relationships was explored by repeating analyses based on 1-, 2-, and 3-year lags. This was performed because no *a priori* basis existed for specifying the optimal time lag of C-P relationships.

The analysis progressed through four stages (See Appendix). Valid inferences about the similarity or differences of structural relationships are contingent upon evidence that the constructs of interest have the same underlying meaning and are measured consistently across time and between groups. Thus, *stage 1* of the analytic process tested the invariance of the DOCS across departments. *Stage 2* began with the full cross-lagged reciprocal model. The key features of this model are as follows: (i) cross-lagged paths from culture to outcomes, (ii) cross-lagged paths from outcomes to culture, (iii) autoregressive paths within constructs, and (iv) residual correlations between culture and outcomes within each measurement occasion. The cross-lagged paths estimate the hypothesized relationships. The autoregressive lags control for prior levels of the variables when

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Table 1. Descriptive statistics and correlations for major study variables in sales departments (lower left) and service departments (upper right).

	Sales		Service																	
Variables	*M*	*SD*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Culture T1	3.67	0.33	3.41	0.26	—	***.49***	***.45***	***.39***	.16	**.23**	***.27***	***.31***	.19	.17	.04					
2. Culture T3	3.70	0.41	3.44	0.28	**.49**	—	***.48***	***.52***	.03	.13	**.21**	***.39***	***.30***	***.27***	.09					
3. Culture T4	3.81	0.37	3.50	0.30	**.41**	**.36**	—	***.40***	.11	.16	***.31***	***.39***	***.41***	**.25**	.03					
4. Culture T6	3.84	0.41	3.54	0.33	.16	**.40**	**.31**	—	.04	.13	.16	**.26**	***.28***	.13	.17					
5. Sat T1	3.71	0.15	3.49	0.16	.17	.18	.13	.14	—	.72	***.56***	***.37***	***.36***	**.25**	−.10					
6. Sat T2	3.74	0.14	3.49	0.14	.13	**.26**	.02	.19	***.66***	—	***.60***	***.49***	***.28***	**.23**	−.06					
7. Sat T3	3.75	0.10	3.50	0.15	**.22**	**.22**	−.01	−.02	***.38***	***.47***	—	***.68***	***.45***	***.40***	.01					
8. Sat T4	3.76	0.11	3.55	0.13	.20	.10	**.25**	.06	***.49***	***.51***	***.54***	—	***.67***	***.58***	.02					
9. Sat T5	3.80	0.08	3.60	0.12	**.24**	**.28**	.15	.18	***.41***	***.32***	***.36***	***.50***	—	***.62***	−.01					
10. Sat T6	3.81	0.09	3.61	0.13	.18	**.27**	**.21**	.19	***.43***	***.27***	***.37***	***.45***	***.47***	—	−.08					
11. Dept. size	12.69	6.10	31.48	13.93	−.10	.03	−.08	−.05	−.08	−.04	.05	−.10	−.15	−.14	—					
12. Sales T1	1.87	0.32	—	—	.05	.16	.01	.10	**.25**	***.34***	.14	**.22**	.14	**.22**	***.27***	—				
13. Sales T2	1.81	0.31	—	—	.05	.15	−.01	.06	**.24**	***.31***	.12	**.21**	.10	.18	***.27***	***.98***	—			
14. Sales T3	1.87	0.30	—	—	.07	.14	.01	.07	***.30***	***.30***	.13	**.24**	.14	***.27***	**.22**	***.95***	***.96***	—		
15. Sales T4	1.85	0.31	—	—	.06	.13	.02	.09	**.21**	**.26**	.06	.18	.16	.18	.20	***.92***	***.93***	***.93***	—	
16. Sales T5	1.91	0.30	—	—	.06	.19	.00	.09	**.20**	***.28***	.10	.16	.17	**.21**	**.22**	.03	***.94***	***.93***	***.98***	—
17. Sales T6	1.95	0.29	—	—	.11	**.21**	.01	.10	**.21**	***.26***	.11	.20	.17	***.27***	.18	***.91***	***.92***	***.92***	***.96***	***.98***

Note: Correlations in bold are significant at $p < .05$. Correlations in bold italics are significant at $p < .01$.

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estimating the impact of the cross-lagged variable. The residual correlations were included on the basis of evidence, provided by Anderson and Williams (1992) that failure to account for these correlations can lead to biased estimates of the cross-lagged effects. The impact of wave-skipping autoregressive lags (e.g., T1 to T3) was also investigated on the basis of prior research demonstrating that inclusion of these paths improved model fit (e.g., Madon, Willard, Guyll, Trudeau & Spoth, 2006).

Stage 3 models compared three more parsimonious models to the full cross-lagged reciprocal model by removing selected paths. The first model examined the possibility that culture influences outcomes over time, but not vice versa, by constraining the cross-lagged paths from outcomes to culture to be zero. The second model examined the converse where outcomes influence culture over time, but not vice versa. The third model, an autoregressive null model, tested the alternative that no direct causal relationships exist by constraining all cross-lagged paths to zero. Finally, *stage 4* models tested the consistency of the autoregressive relationships (e.g., C-C and P-P) and C-P relationships over time. The first set of models constrained the autoregressive lags to be equal, and the second constrained the cross-lagged paths to be equal.

Results

Measurement invariance

Measurement invariance of the DOCS across time and departments was examined at the department level using item parcels defined by the four cultural traits. We followed the procedure outlined by Vandenberg and Lance (2000) with one exception. The omnibus test suggested by Vandenberg and Lance can lead to erroneous conclusions (e.g., Raju, Laffitte & Byrne, 2002) and, therefore, was excluded from interpretation. Additionally, within-variable measurement error correlations were allowed because repeated measures of the same variable generally results in correlated measurement errors (Bollen, 1989).

Examination of equivalence of factor patterns (i.e., configural invariance) with factor loadings freely estimated across time and departments indicated that the model fit the data well (model 1 SRMR = 0.02, CFI = 0.99, RMSEA = 0.04, $\chi^2(120) = 232.62$). Next, metric equivalence was assessed by constraining the factor loadings to be equal across departments (Model 2a), time (Model 2b), and both time and departments (Model 2c). As demonstrated by non-significant changes in chi-square tests, neither Model 2a nor 2b fits the data significantly worse than the configural model. Similarly, Model 2c also did not fit the data significantly worse than 2a or 2b, supporting metric invariance across both time and departments (Model 2c SRMR = 0.02, CFI = 0.98, RMSEA = 0.05, $\chi^2(169) = 257.23$).

Next, scalar invariance was examined by constraining intercept terms to be equal across departments (Model 3a) and time (Model 3b). Scalar invariance analyses indicated a significant reduction in fit (Model 3a) and failed convergence (Model 3b). These results indicated that scalar invariance is not present and that testing more restrictive models was unnecessary. The existence of metric invariance provides sufficient justification for proceeding with the structural analyses (Bollen, 1989; Cheung & Rensvold, 1998). As the pattern of factor loadings observed for the DOCS was consistent across time, these parameters were constrained to be equal.

Culture and customer satisfaction

Hypothesis 1, proposing that department culture has causal priority over customer satisfaction, was tested separately for service and sales departments. The reciprocal effect predicted by Hypothesis 3 was also tested separately by

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department. Hypothesis-testing models were run for all time lags, but our interpretation focuses only on the best-fitting lag periods.

Service departments

To illustrate our model-testing process, fit statistics for all 1-, 2-, and 3-year lag models are presented in Table 2. Overall, the 1-year lag results provided the best fit. In contrast, an autoregressive null model did not fit significantly worse for the 2- and 3-year lag analyses, indicating that C-P effects did not emerge at these time intervals.

On the basis of the 1-year lag, the initial full cross-lagged reciprocal model (model 1) did not satisfy all of the criteria for acceptable fit (e.g., SRMR > 0.08). However, an alternative model (Model 1a) including wave-skipping autoregressive lags (e.g., T1 to T3, and T2 to T4) resulted in significant improvement of fit, had acceptable fit overall, and was retained as the comparison model for subsequent stages (SRMR $= 0.04$, CFI $= 0.99$, RMSEA $= 0.05$, $\chi^2(176) = 218.50$). Model 2, which constrained the 1-year cross-lagged effects of customer satisfaction on culture to be zero, did not result in significantly worse fit. In contrast, Model 3, which constrained the 1-year cross-lagged effects of culture on customer satisfaction to be zero, did result in a significant decline in fit, as did Model 4, the autoregressive null model. These results support a direct effect of culture on customer satisfaction but not reverse or reciprocal effects.

Models 5 and 6 were tested to examine the consistency of the 1-year lag model over time. Model 5, which constrained the autoregressive lags to be equal over corresponding time periods, did not result in significantly worse fit. Similarly, imposing the constraint of equal cross-lags over time periods (Model 6) also did not result in a significant decline in fit; thus, model 6 was retained as the final 1-year lag model (SRMR $= 0.08$, CFI $= 0.99$, RMSEA $= 0.06$, $\chi^2(190) = 239.38$). This indicates that the effect of culture on customer satisfaction was consistent over time. Figure 1a shows the parameter estimates for this model. The cross-lagged paths from culture to customer satisfaction were stable over time and significant ($p < .01$) with standardized estimates ranging from .16 to .20 (note that although the coefficients were constrained to be equal in the unstandardized solution, standardization led to slightly different estimates). For service departments, the results supported the hypothesis that culture has causal priority over customer satisfaction (Hypothesis 1) but failed to support the hypothesis of reciprocal relationships over time (Hypothesis 3).

Sales departments

Overall, the 2-year lag, results provided the best fit to the data. As with the service department results, the model-testing sequence resulted in retaining model 6, with equal culture-to-performance cross-lags, as the final model (SRMR $= 0.06$, CFI $= 0.98$, RMSEA $= 0.05$, $\chi^2(181) = 225.09$). Table 3 contains fit statistics, and Figure 1b shows the parameter estimates for this model (fit statistics for all time periods and models are available upon request from the authors). The cross-lagged paths from culture to customer satisfaction were stable over time and significant ($p < .01$) with standardized estimates ranging from .13 to .20. Therefore, results for sales departments supported the hypothesis that culture has causal priority over customer satisfaction (Hypothesis 1) but failed to support the hypothesis of reciprocal relationships over time (Hypothesis 3).

Culture and vehicle sales

Hypothesis 2 proposed that culture would have causal priority over vehicle sales. Overall, the 2-year lag results provided the best fit. Again, Model 6, including equal 2-year culture-to-performance cross-lags, was retained as the final model for the effects of culture on vehicle sales (SRMR $= 0.06$, CFI $= 0.98$, RMSEA $= 0.07$, $\chi^2(196) = 296.41$; Table 3). Figure 1c shows the parameter estimates for this model. The cross-lagged paths from culture to vehicle sales were stable over time and statistically significant ($p < .05$)—standardized estimates were approximately .03.

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Table 2. Summary of Fit indices for service department models (all lag periods).

Model	SRMR	CFI	RMSEA	Chi-square	*df*	Comparison model	ΔChi-square	Δ*df*
1-year cross-lagged models: culture and customer satisfaction*								
1. Full cross-lag	0.12	0.98	0.07	256.79	182	Model 1a	***38.29***	6
1a. Full cross-lag with wave-skipping[a]	0.04	0.99	0.05	218.50	176	—		
2. Cross-lagged: culture to sat. only	0.05	0.99	0.05	222.73	179	Model 1a	4.23	3
3. Cross-lagged: sat. to culture only	0.09	0.98	0.06	238.04	179	Model 1a	***19.54***	3
4. Autoregressive null (no cross-lags)	0.11	0.98	0.06	242.60	182	Model 2	***19.87***	3
5. Equal autoregressive lags	0.07	0.99	0.05	238.14	188	Model 2	15.41	9
6. Equal cross-lags (within construct)	0.08	0.99	0.06	239.38	190	Model 5	1.23	2
2-year cross-lagged models: culture and customer satisfaction								
1. Full cross-lag	0.15	0.97	0.08	277.54	182	Model 1a	***39.10***	6
1a. Full cross-lag with wave-skipping[a]	0.09	0.98	0.06	238.44	176	—		
2. Cross-lagged: culture to sat. only	0.09	0.98	0.06	239.08	179	Model 1a	0.64	3
3. Cross-lagged: sat. to culture only	0.11	0.98	0.06	241.98	179	Model 1a	3.54	3
4. Autoregressive null (no cross-lags)	0.11	0.98	0.06	242.60	182	Model 2	3.52	3
						Model 3	0.62	3
5. Equal autoregressive lags	0.12	0.98	0.06	256.18	191	Model 4	13.58	9
6. Equal cross-lags (within construct)[b]	—	—	—	—	—	—		
3-year cross-lagged models: culture and customer satisfaction								
1. Full cross-lag	0.15	0.97	0.07	277.65	184	Model 1a	***38.86***	6
1a. Full cross-lag with wave-skipping[a]	0.09	0.98	0.06	238.79	178	—		
2. Cross-lagged: culture to sat. only	0.09	0.98	0.06	239.38	180	Model 1a	0.59	2
3. Cross-lagged: sat. to culture only	0.11	0.98	0.06	241.95	180	Model 1a	3.16	2
4. Autoregressive null (no cross-lags)	0.11	0.98	0.06	242.60	182	Model 1a	3.81	4
5. Equal autoregressive lags	0.12	0.98	0.06	256.18	191	Model 4	13.58	9
6. Equal cross-lags (within construct)[b]	—	—	—	—	—	—		

Note: Table shows model results corresponding to stage 2 (labeled Models 1 and 1a), stage 3 (labeled Models 2, 3, and 4), and stage 4 (labeled Models 5 and 6) of the described analytic strategy. This analytic strategy was repeated for 1-, 2-, and 3-year cross-lags. Chi-square values in bold are significant at $p < .05$. Chi-square values in bold italics are significant at $p < .01$.

[a] Model with autoregressive wave-skipping lags.

[b] Model not applicable because the autoregressive null model was not rejected.

* The 1-year cross-lagged model with equal cross-lags from culture to customer satisfaction provided the most acceptable fit and was retained as the final model.

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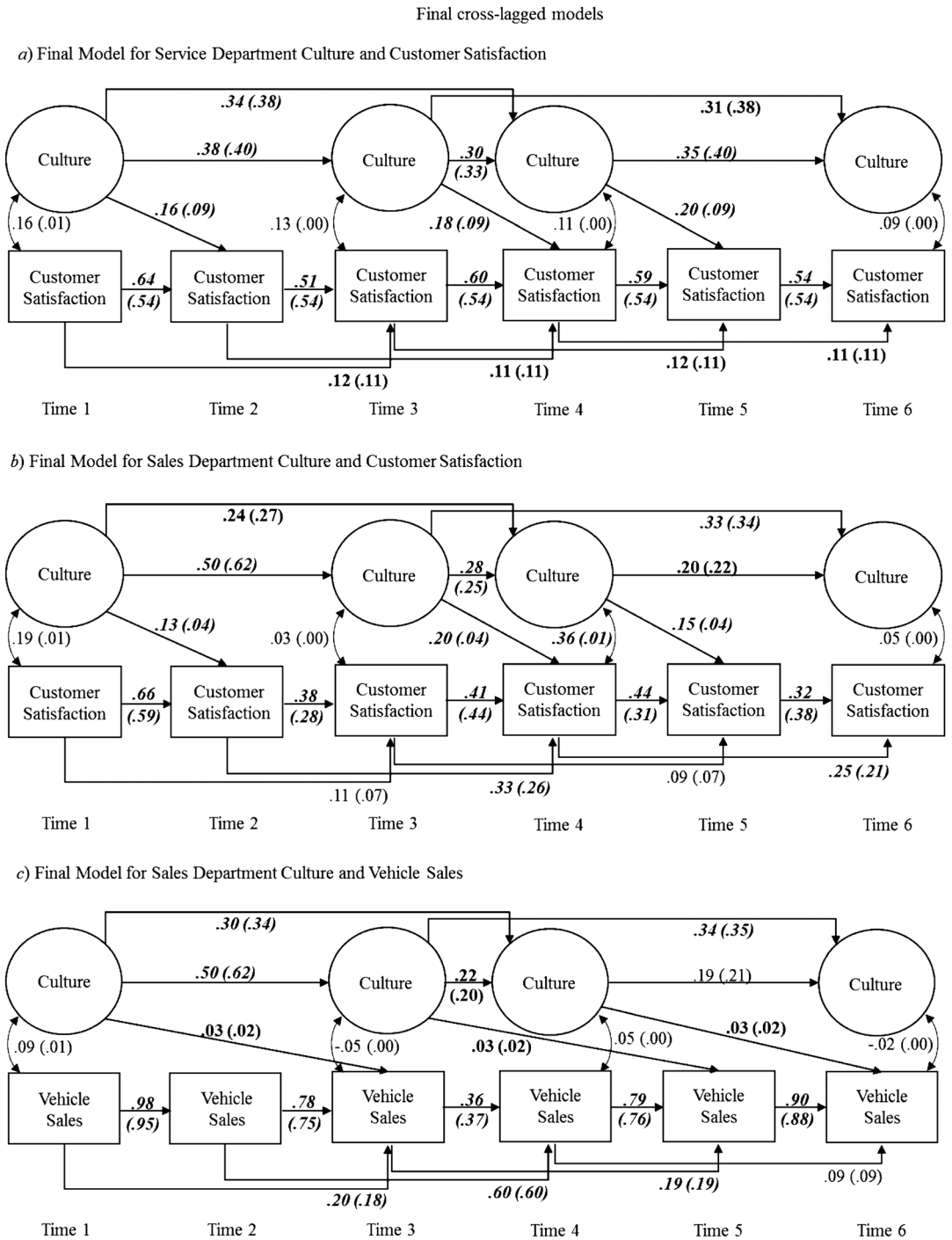

Notes. Standardized path coefficients are shown with unstandardized estimates in parentheses. Values in bold are significant at $p < .05$. Values in bold italics are significant at $p < .01$. For clarity, measurement model and disturbance parameters have been omitted from figures *a, b, and c*; additionally, control variable parameters have been omitted from figure *c*.

Figure 1. Final cross-lagged models

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Table 3. Summary of fit indices for sales departments models (best-fitting lag periods*).

Model	SRMR	CFI	RMSEA	Chi-square	*df*	Comparison model	ΔChi-square	Δ*df*
2-year cross-lagged models: culture and customer satisfaction								
1. Full cross-lag	0.12	0.97	0.07	257.67	182	Model 1a	***34.94***	6
1a. Full cross-lag with wave-skipping[a]	0.06	0.98	0.05	222.73	176	—		
2. Cross-lagged: culture to sat. only	0.06	0.98	0.05	224.45	179	Model 1a	1.72	3
3. Cross-lagged: sat. to culture only	0.08	0.98	0.06	232.81	179	Model 1a	**10.08**	3
4. Autoregressive null (no cross-lags)	0.09	0.98	0.06	234.53	182	Model 2	**10.08**	3
5. Equal autoregressive lags	0.09	0.98	0.06	256.66	188	Model 2	***32.21***	9
6. Equal cross-lags (within construct)	0.06	0.98	0.05	225.09	181	Model 2	0.64	2
2-year cross-lagged models: culture and vehicle sales								
1. Full cross-lag	0.09	0.96	0.09	340.40	197	Model 1a	***49.77***	6
1a. Full cross-lag with wave-skipping[a]	0.04	0.98	0.07	290.63	191	—		
2. Cross-lagged: culture to sales only	0.05	0.98	0.07	293.55	194	Model 1a	2.92	3
3. Cross-lagged: sales to culture only	0.04	0.97	0.08	298.73	194	Model 1a	**8.10**	3
4. Autoregressive null (no cross-lags)	0.06	0.97	0.08	301.65	197	Model 2	**8.10**	3
5. Equal autoregressive lags	0.07	0.97	0.08	330.73	203	Model 2	***37.19***	9
6. Equal cross-lags (within construct)	0.06	0.98	0.07	296.41	196	Model 2	2.86	2
2-year cross-lagged models: customer satisfaction and vehicle sales								
1. Full cross-lag	0.10	0.94	0.14	138.01	47	Model 1a	***53.03***	8
1a. Full cross-lag with wave-skipping[a]	0.07	0.92	0.11	84.98	39	—		
2. Cross-lagged: sat. to sales only	0.08	0.97	0.10	86.46	43	Model 1a	1.48	4
3. Cross-lagged: sales to sat. only	0.07	0.97	0.11	95.12	43	Model 1a	**10.14**	4
4. Autoregressive null (no cross-lags)	0.09	0.97	0.11	96.80	47	Model 2	**10.34**	4
5. Equal autoregressive lags	0.10	0.95	0.13	141.56	57	Model 2	***55.10***	14
6. Equal cross-lags (within construct)	0.08	0.97	0.10	91.27	46	Model 2	4.81	3
Mediation models: culture to customer satisfaction to vehicle sales								
1. Partial mediation	0.10	0.95	0.08	536.15	330	Model 1a	***71.51***	10
1a. Partial mediation with wave-skipping[a]	0.07	0.97	0.07	464.65	320	—		
2. Full mediation	0.07	0.97	0.07	471.33	323	Model 1a	6.68	3
3a. Cross-lagged: culture to sat. only	0.07	0.96	0.07	481.79	327	Model 2	**10.47**	4
3b. Cross-lagged: sat. to sales only	0.09	0.96	0.07	480.45	326	Model 2	**9.12**	3
4. Autoregressive null (no cross-lags)	0.09	0.96	0.07	490.89	330	Model 2	***19.56***	7
5. Equal autoregressive lags	0.09	0.95	0.08	536.98	339	Model 2	***65.65***	16
6. Equal cross-lags (within construct)	0.07	0.97	0.07	476.79	328	Model 2	5.47	5

Note: Chi-square values in bold are significant at $p < .05$. Chi-square values in bold italics are significant at $p < .01$.
[a] Model with autoregressive wave-skipping lags.
* Fit statistics for all lag periods are available upon request from the authors.

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There was no evidence of reciprocal or reverse relationships. Therefore, results support the hypothesis that culture has causal priority over vehicle sales (Hypothesis 2).

Mediation of the culture–sales relationships by customer satisfaction

Hypothesis 4 proposed that customer satisfaction *mediates* the relationship between culture and vehicle sales. Consistent with the results described above for sales departments, the cross-lagged effects of customer satisfaction and vehicle sales on culture were excluded, and the cross-lagged effects of culture on customer satisfaction and vehicle sales were set to 2-year lags. Prior to testing mediation, an additional set of models was needed examining the longitudinal relationship between customer satisfaction and vehicle sales. This corresponds to Baron and Kenny's (1986) third condition of mediation: a direct effect of the mediator on the dependent variable. Results supported a 2-year lag model with wave-skipping autoregressive lags and equal cross-lagged effects from customer satisfaction to vehicles sales (Model 6 SRMR = 0.08, CFI = 0.97, RMSEA = 0.10, $\chi^2(46) = 91.27$; Table 3). The cross-lagged effects were stable over time and significant ($p < .05$), with standardized estimates ranging from .02 to .04.

The results of mediation tests are shown in the lower portion of Table 3. A partial mediation model included 2-year cross-lagged effects of culture on customer satisfaction, culture on vehicle sales, and customer satisfaction on vehicle sales (Model 1). Consistent with prior results, the inclusion of wave-skipping autoregressive lags (Model 1a) resulted in a significant improvement in fit. A full mediation model (Model 2), removing the direct paths from culture to vehicle sales, did not result in a significant decline in fit. In contrast, Models 3a and 3b, which removed the cross-lagged effects of customer satisfaction on sales and the cross-lagged effects of culture on customer satisfaction, respectively, resulted in a significant decline in fit. Finally, constraining corresponding autoregressive lags to be equal (Model 5) resulted in significantly worse fit, whereas constraining the cross-lagged effects to be equal (Model 6) did not.

A full mediation model with equal cross-lagged effects from culture to customer satisfaction and customer satisfaction to vehicle sales (Model 6) was retained as the final model (SRMR = 0.07, CFI = 0.97, RMSEA = 0.07, $\chi^2(328) = 476.79$). Figure 2 shows the parameter estimates for this model. The cross-lagged paths from culture to customer satisfaction were stable over time and statistically significant ($p < .01$), with standardized estimates ranging from .12 to .19. The cross-lagged paths from customer satisfaction to sales were stable over time and significant ($p < .05$), with standardized estimates ranging from .02 to .04. Therefore, results supported customer satisfaction as fully mediating the culture-to-vehicle sales relationship.

Discussion

The results of our study suggest that organizational culture has causal priority over performance outcomes. Overall, department culture was found to consistently predict higher subsequent levels of customer satisfaction ratings and vehicle sales, with no evidence obtained for a reciprocal performance-to-culture feedback loop. In addition, the positive effect of culture on vehicle sales was mediated by customer satisfaction. We discuss how these findings contribute important insights regarding the nature and timing of C-P relationships, both within specific service and sales organizational contexts and more broadly within the culture and performance research domain.

Causal priority of C-P relationships

The causal priority of culture was evidenced by a consistent pattern in which department culture predicted subsequent levels of performance more strongly than vice versa, controlling for prior levels of culture and performance.

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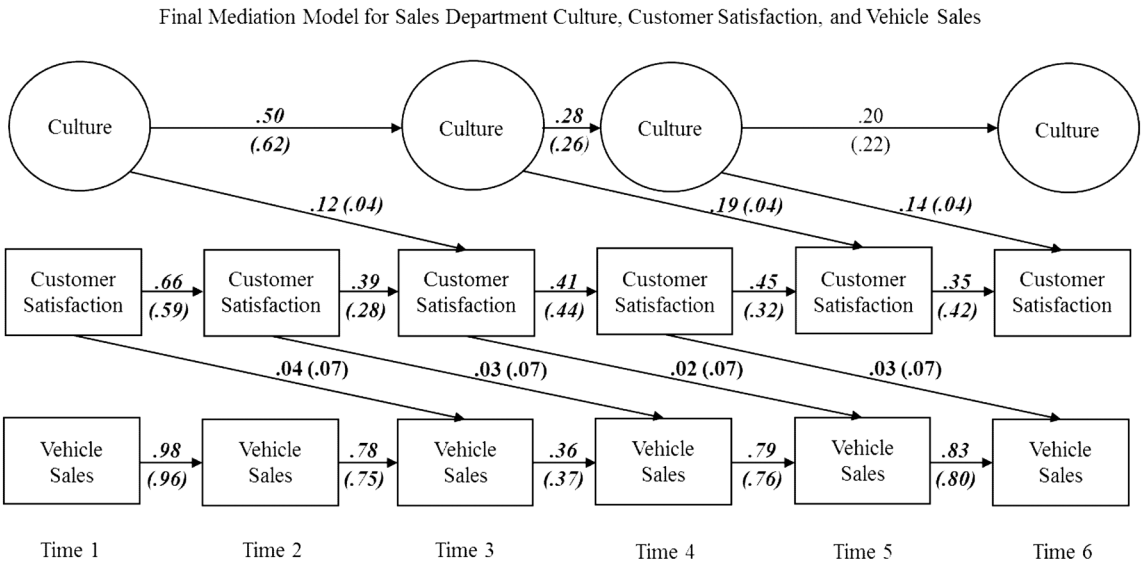

Notes. Standardized path coefficients are shown with unstandardized estimates in parentheses. Values in bold are significant at $p < .05$. Values in bold-italics are significant at $p < .01$. For clarity, measurement model, disturbance, control variable, within-time disturbance covariation, and wave-skipping autoregressive lag parameters have been omitted from the figure.

Figure 2. Final mediation model for sales department culture, customer satisfaction, and vehicle sales

Indeed, the cross-lagged effects of performance on department culture could be removed from all tested models without significantly reducing fit. Support for an antecedent role is consistent with the resource-based view of culture as a source of competitive advantage (Barney, 1986, 1991) and extends prior research linking organizational culture to performance (e.g., Pelham & Wilson, 1996; Zahra & Covin 1995).

Timing of C-P relationships

In the present study, the immediacy and magnitude of a culture-to-performance effect depended on department and type of performance indicator. In service departments, culture's effect on customer satisfaction emerged consistently for 1-year lags. In contrast, the culture-to-customer satisfaction relationship emerged at 2-year lags in sales departments, as did the effect of culture on vehicle sales. Several possibilities may account for the longer delay of C-P relationships in sales departments.

The customer service and sales experience in automobile dealerships consists of a mix of tangible and intangible services (Shostack, 1977). Tangible services include vehicles, parts, and maintenance, and intangible services include the behaviors of the service provider that guide customers' impressions of service quality (Schneider & Bowen, 1985). It is interesting to speculate that culture may have a more direct and immediate effect on customer satisfaction outcomes in the provision of intangible services, such as in service departments where employees have a greater opportunity to be responsive to problems and demonstrate competency and fairness in a continuous interaction with the customer. Alternatively, customer satisfaction with the sales department might be due in larger part to tangible factors less directly under the influence of culture (e.g., sales price) and which take time to manifest (e.g., the car's long-term performance). Future research could test these observations by systematically comparing the timing of C-P relationships for tangible and intangible service providers.

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Although prior longitudinal studies have not resulted in a coherent pattern of cross-lagged C-P effects—and more fundamentally, such studies are lacking (Sackmann, 2011)—a few observations are nevertheless warranted regarding what is known so far and the implications for practitioners and researchers. In combination with prior studies, our findings suggest that the magnitude of C-P relationships tends to peak somewhere between 1 and 3 years (e.g., Kotrba et al., 2012; Pelham & Wilson, 1996; Petty et al., 1995), although a relationship may be observable over a longer time horizon. Only two published studies to date seem to stretch beyond the notion of the 1-to-3-year peak. Zahra and Covin (1995) found that the correlations between entrepreneurial culture and financial performance increased up to 6 years following culture assessment, whereas Gordon and DiTomaso (1992) documented slightly increasing relationships between the cultural stability adaptability of 11 insurance firms and their annual growth in assets and premiums up to 4 years following culture assessment. Other studies have reinforced the stability of C-P relationships by demonstrating positive effects with performance operationalized as a 3-year average (e.g., Denison & Mishra, 1995).

For practitioners, the notion of a 1-to-3-year peak could prove useful to set general guidelines about the return on investment for culture-focused work and interventions. If replicated, the pattern identified here regarding tangible versus intangible service outcomes could inform thinking about where to look for these returns *first* and where additional patience will be necessary. More generally, we suspect this finding will confirm popular perspectives of culture-focused work as a relatively long-term management strategy when juxtaposed with other nearer term solutions and tools.

For researchers, the 1-to-3-year peak informs the characteristics of adequate study design within the C-P domain. The most direct implication is that findings from cross-sectional designs should not be expected to generalize to other time lags and may misrepresent the magnitude of C-P relationships. Obviously, as our study has pointed out, the context and nature of the culture and performance variables under examination are likely to influence the peak and temporal stability of the relationships observed (Zahra & Covin, 1995). Perhaps more importantly, this research and subsequent studies will lead to the emergence of new theoretical perspectives and models to help explain and predict the nuanced pattern of C-P relationships, taking time and several of these context factors into account.

Satisfaction versus sales outcomes

Our results also highlighted a difference in magnitude between culture-to-satisfaction and culture-to-sales relationships. From one perspective, the small effect of department culture on vehicle sales might be considered too weak to be practically meaningful. However, when considering the size of these effects, it is important to remember that prior levels of vehicle sales and culture, as well as department size, were statistically controlled for when estimating the cross-lagged relationships. Together, these factors accounted for 90 percent of the total variance in vehicle sales, leaving little variance left to be accounted for by year-to-year changes in culture. These findings are consistent with prior research that has reported large reductions in predictive relationships with financial outcomes once prior levels are taken into account (e.g., Koys, 2001; Wright, Gardner, Moynihan & Allen, 2005). Last, it is important to point out that even small effects can have large practical implications, particularly when the relationships are distal with a number of intervening processes, competing causes, and random factors (Abelson, 1985). Future research could shed additional light on the proximal-distal nature of C-P relationships by attempting to clarify potential mediating processes.

Mediation by customer satisfaction

Our results suggest a causal chain, whereby the culture of sales departments affects customer satisfaction, which, in turn, influences the number of vehicles sold. At each point in the sequence, relationships emerged at a 2-year lag,

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underscoring that the impact of culture on vehicle sales is not immediate. Although the mechanisms responsible for these linkages deserve further study, our rationale focuses on the importance of positive word of mouth and customer loyalty. These factors seem particularly important owing to the regional markets that are typically serviced by automobile dealerships. In other words, because it may be difficult for regionally based organizations to attract buyers from other geographical regions, maintaining a positive reputation in their community and building a loyal customer base seem paramount to long-term success. Our results suggest that neither is built overnight, but that a strong culture at the foundation can be a unique point of leverage for winning and retaining customers over time. Future research should explore other potential mediators of C-P relationships in other contexts.

Limitations

Four main limitations should be considered when interpreting the results of our study. First, there was a degree of asymmetry and missing data that had to be overcome when aligning the culture and performance variables to time points for analytic purposes. As a result, it is possible that results could have differed with more closely matched timing or complete data. However, we believe that any impact of these asymmetries on the present results was minimal, given that many of our results demonstrated clear and consistent patterns over time (e.g., all models could be estimated with equal cross-lagged effects). Second, the relatively small number of departments included might be considered a limitation. Although the present sample size did not result in being underpowered to detect small relationships, it can nevertheless result in over- or under-estimated standard errors in structural equation modeling (Muthén & Muthén, 2002). This latter point underscores the need for future studies that replicate our findings, particularly with respect to the lack of reciprocal C-P relationships observed. Third, it is important to highlight that the causal argument presented here is based on non-experimental data, which to some degree reduces the strength of causal inference. Although the collection of longitudinal data and the use of cross-lagged panel analyses strengthen our claims of causal priority (Kenny & Harackiewicz, 1979), other longitudinal designs including quasi-experimentation should be conducted, if feasible, to further test the pattern of relationships reported here.

Fourth, our decision to derive an overall index of department culture by taking the mean of culture traits did not allow for a multidimensional exploration of longitudinal C-P relationships. Prior research has generally supported a multidimensional (or configurational) rather than global culture perspective and accumulated a complex pattern of C-P relationships across various dimensions of culture and performance criteria (e.g., Denison et al., 2014; Hartnell et al., 2011; Sackmann, 2011). However, in our pragmatic view, the decision to model and report results based on the overall culture (as an aggregate of measured culture traits) was justified, first, in order to achieve a parsimonious test of temporal precedence and, second, given that a trait-level analysis failed to identify unique patterns of C-P relationships or modify the substantive conclusions drawn from the overall culture results. Having demonstrated the temporal precedence of culture generally in this study, subsequent research could build upon these findings by exploring the combination and interaction of culture dimensions and performance criteria within a multivariate framework (Kotrba et al., 2012).

Conclusion

Our study adds important evidence of a longitudinal culture-to-performance relationship to the research literature (Sackmann, 2011; Wilderom et al., 2000), indicating that higher intensity of positive organizational culture traits among automobile dealerships leads to greater customer satisfaction in later years. Moreover, culturally based gains in customer satisfaction led to small but reliable improvements in subsequent vehicle sales. On the other hand, no evidence of a performance-to-culture feedback loop was found, thus failing to support a reciprocal or reverse

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causality model. Therefore, in response to our initial causal priority question, we conclude from our study that *it is culture that comes first*, with performance levels to follow.

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APPENDIX ANALYSIS FLOWCHART