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EMPIRICAL ORGANIZATIONAL-LEVEL EXAMINATIONS OF AGENCY AND COLLABORATIVE PREDICTIONS OF PERFORMANCE-CONTINGENT COMPENSATION

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Competitive predictions regarding the relationships between: (a) monitoring and agent tenure, and (b) performance-contingent compensation are derived from agency theory and collaborative perspectives. These results are tested in a within-industry (trucking) sample and in a cross-industry sample. The results partially support both perspectives, particularly with respect to monitoring and agent tenure. Implications of the results for theory and practice are discussed.

Compensation systems are critical in aligning the interests of divergent organizational groups (Conlon and Parks, 1990). The determinants of compensation systems thus evoke considerable interest in organizational-level compensation research, primarily from an agency theory perspective (e.g., Eisenhardt, 1988; Gomez-Mejia and Balkin, 1992). Recently, the collaborative perspective (Parks and Conlon, 1995) emerged as a competing explanation for compensation dynamics. The agency and collaborative perspectives contain metaphors that can be used to develop contrasting macro-level explanations of organizational phenomena. Since the collaborative perspective is relatively new, only one competitive empirical examination of their relative validity (Parks and Conlon, 1995) is available. The present study seeks to extend scientific knowledge by testing competitively the extent to which agency versus collaborative predictions provide adequate explanations of organizational compensation systems.

Background and predictions

Strategic compensation research generally uses the principal-agent approach of agency theory to elucidate compensation contracts. This research is valuable, but leaves at least two unexplored concerns. One, with few exceptions (e.g., Gomez-Mejia and Balkin, 1992), it addresses compensation contracts for either executives/top managers (Beatty and Zajac, 1994; Gomez-Mejia and Wiseman, 1997; Tosi and Gomez-Mejia, 1994; Westphal and Zajac, 1994) or sales forces (Basu et al., 1985; Eisenhardt, 1988; Oliver and Anderson, 1994). The strategic human resource management literature (e.g., Arthur, 1994) emphasizes

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that other key employee groups can also be central to organizational functioning. Two, *organizational*-level studies of this issue are rare (Beatty and Zajac, 1994; Bloom and Milkovich, 1998). This study addresses these omissions empirically using contrasting agency and collaborative perspectives.

Agency theory is an outgrowth of economic risk research (Carmichael, 1983; Holmstrom, 1979, 1982; Jensen and Meckling, 1976; Ross, 1973; Stiglitz, 1974). It describes the relationship between a principal (who delegates work) and an agent (who actually performs the work), and views people as self-interested, rational, and risk-averse (Eisenhardt, 1988, 1989; Keeley, 1980). Agency problems result from information asymmetries and goal divergence between principals and agents, and from principals' inability to monitor agents' behaviors (Anderson and Oliver, 1987; Lambert, Larcker, and Weigelt, 1993; Stroh et al., 1996). Agent independence and autonomy create a significant moral hazard (Holmstrom, 1979) that the agent will be self-serving; the hazard is reduced by principals developing rules of the game (Gomez-Mejia and Balkin, 1992) such as designing programmable jobs, monitoring agent behavior, or rewarding performance (Jensen, 1983).

The *collaborative perspective* offers a stark contrast, considering agency explanations of behavior to be seriously incomplete (Simon, 1991: 42). Collaboration, trust, and cooperation, rather than self-serving interest and opportunism, are viewed as alternative ways of reducing transaction costs (Bradach and Eccles, 1989; Creed and Miles, 1996). This perspective considers employment contracts to be not only economic exchanges, but also social exchanges (Rousseau and Parks, 1993) that develop into relational contracts (Gomez-Mejia and Wiseman, 1997; MacNeil, 1978), with trust as a key sociological element (Creed and Miles, 1996). Recurring exchanges, information flow, reductions in information asymmetries, and repeated contacts result in collaboration and risk-sharing between principals and agents.

Both agency and collaborative perspectives apply individual-level phenomena (trust, self-interest) to the organizational level, use metaphorical analyses to elucidate organizational dynamics, and focus on the availability of information between principals and agents. Beyond this, the two theories are markedly different, necessitating competitive empirical tests. We use *performance-contingent compensation* for such a test since it represents risk transfer, a central aspect of both perspectives. Reliance on performance-contingent compensation reflects different assumptions about the interests and motivations of principals and agents, since performance-contingent compensation embodies more risk for the agent (than, say, seniority-based pay). Agency and collaborative perspectives offer shared antecedents of compensation system choice. We focus on two—*agent monitoring* and *agent tenure*. Agent monitoring is a common concern in agency studies (e.g., Conlon and Parks, 1990; Eisenhardt, 1988; Stroh et al., 1996). Agent tenure is studied less often, but many agency and collaborative arguments implicitly derive from agent tenure since long-term relationships allow principals to accumulate richer information on agent behaviors (Stroh et al., 1996).

Agent monitoring

Agency theory posits that agents have more information about their abilities and effort levels than do principals (Parks and Conlon, 1995; Watts and Zimmerman, 1986). This information asymmetry encourages agents to act opportunistically. To preclude agents from pursuing their own interests, principals can either invest resources in monitoring the *behavior* of agents or transfer risk to the agent by making pay performance- or *outcome*-contingent (Holmstrom, 1979). When behavior can be monitored, performance-contingent compensation is not necessary, but when behaviors cannot be or are not monitored, principals design compensation arrangements such as performance-based pay (Eisenhardt, 1988) to transfer risk to the agent, who must now either perform effectively or suffer compensation consequences. Extrapolating to the organizational level, organizations are more prone to relying on performance-contingent compensation when agent behaviors are not monitored (Eisenhardt, 1988).

The collaborative perspective suggests that monitoring supplies more information to principals about agent behaviors. Cooperation and repeated contact allow the development of a relational contract in which agents have confidence in principals' good faith dealings. Agents then accept more risk, i.e., the potential pay

reductions (and premiums) with outcome-based pay. Monitoring fosters commitment (Gomez-Mejia and Wiseman, 1997), trust (Gambetta, 1988), and the development of a relational contract (MacNeil, 1978). Higher levels of monitoring should thus be associated with greater use of performance-contingent compensation systems. The following competing hypotheses derive from these arguments:

Hypothesis 1a: Agent monitoring is negatively related to the use of performance-contingent compensation systems. (Agency theory)

Hypothesis 1b: Agent monitoring is positively related to the use of performance-contingent compensation systems. (Collaborative perspective)

Agent tenure

Agency theory argues that organizations need not transfer risk to agents when employment relationships are long-lasting. Long-term relationships diminish information asymmetries, allowing principals to develop more complete information about agents. High agent tenure should therefore be associated with the use of behavior- rather than outcome-based compensation systems (Sonnenfeld, Peiperl, and Kotter, 1988; Stroh et al., 1996).

In the collaborative perspective, high involvement between principals and agents blurs the distinction between the two over time. Reductions in information asymmetries result in partnership and collaboration (Parks and Conlon, 1995), which in turn create opportunity (e.g., potentially higher pay) and vulnerability (e.g., potential reductions in pay or nonreciprocation by principals) for agents (Kramer, Brewer, and Hanna, 1996). Long-standing relationships, with their inherent trust and the expectation of good faith dealings (e.g., Mahoney, Huff and Huff, 1994; Ring and Van de Ven, 1992; Williamson, 1985), diminish perceived risk. Agents accept business risk because of the mutual expectation of an indefinite relationship with a malleable contract. Agent tenure promotes the use of performance-contingent compensation in this way, leading to the following competitive hypotheses:

Hypothesis 2a: Agent tenure is negatively related to the use of performance-contingent compensation systems. (Agency theory)

Hypothesis 2b: Agent tenure is positively related to the use of performance-contingent compensation systems. (Collaborative perspective)

We test these predictions in two studies. The first is conducted in the trucking industry. Driver compensation is a critical concern in the trucking industry (Mandel, 1995), and most macro- or strategic human resource management studies are conducted within industry sectors, enabling tighter control of extraneous factors. The second study samples organizations across a variety of industries. Cross-industry studies are prevalent in organizational compensation research, enabling an assessment of the generalizability of findings.

This study therefore offers several major contributions to the compensation literature. It is among the first to examine macro compensation dynamics for employee groups other than top level executives or managers. It explores competing predictions from distinct theoretical frameworks. Juxtaposing predictions in this way advances scientific knowledge both through hypothesis falsification and through an emphasis on the complementary facets of different theories (Allison, 1971; Feyerabend, 1981). It combines single-industry and cross-industry approaches, minimizing the problems inherent in each while maximizing the advantages of both.

Study 1: Method and results

Sample and measures

The population for the study was trucking firms included in the 1993–1994 version of the *TTS Blue Book of Trucking Companies* (*Blue Book*). Of the 3,104 companies listed, 1,072 had at least 30 total employees in the 1991, 1992, or 1993 calendar years and were still in business—the criteria for inclusion in the sample. The key informant for each organization, the highest human resource manager, was sent a 24-page questionnaire. Completed responses were returned by 379 participants, a 36% (379/1072) response rate. The questions relevant in this study concerned policies and practices applicable to company truck drivers.

Agent monitoring. We identified three direct agent monitoring measures—computer tracking, communication systems, and narrow supervisory span, and two indirect monitoring measures—relays and scheduling stability.

Direct monitoring. *Computer tracking*, the first measure, is arguably different from direct observations of employees, but it accomplishes the same objectives as other monitoring activities—it allows supervisors (e.g., dispatchers) to track minuscule details of employee behavior in real time. The use of sophisticated computer equipment increases the extent to which organizations can monitor drivers' activities. Respondents reported the percent of the trucks in their fleets with on-board computers, satellite tracking, and truck diagnostic or performance monitoring systems. Since companies are unlikely to have all three types of computer monitoring systems, and since some technologies encompass others (e.g., computer monitoring may include satellite tracking), this variable was operationalized as the *maximum* use of any of the monitoring systems. Higher scores on this index indicate greater monitoring.

The second measure was on-board *communications systems* which, unlike computer monitoring, allow two-way communication between drivers and dispatchers. Respondents reported the percent of trucks with on-board systems to communicate with dispatchers, and cellular telephones. The maximum use of either of these practices constituted our measure.

Narrow supervisory span is another aspect of monitoring. Span of control was measured as the *reverse* of the number of drivers reporting to each dispatcher, and was logged for analysis. Higher values indicate a lower span of control, i.e., higher levels of monitoring. The variable was reverse coded to ensure consistency with predictions.

Indirect monitoring was defined as job programmability, and operationalized in two ways. The jobs of truck drivers are not easily programmed, particularly the jobs of irregular route over-the-road drivers. Still, variations in job programmability are evident across firms. Many trucking companies use *relays* to achieve a more regular pattern of work for drivers (Corsi and Grimm, 1987). In a relay system, a driver delivers the truck and the shipment to a designated point where another driver continues the trip in the same cab, necessitating that drivers adhere to strict schedules and patterns. The use of relays was measured as the percent of drivers typically driving in relays. Higher scores on this variable reflect higher levels of agent monitoring.

Schedule stability, the second indirect monitoring measure, improves knowledge of means-end relationships (Stroh et al., 1996). This variable was measured as the frequency with which schedule changes for drivers occurred at the last minute. Responses ranged from (1) Never to (5) Almost Always, and were reverse coded for analysis.

Agent tenure. This variable was operationalized as the percent of drivers who had worked for the company for more than 24 months. The 24-month cutoff was used since industry experts indicated that drivers usually quit within the first two years of employment.

Performance-contingent compensation. Two measures of performance-contingent compensation were used—outcome-based pay and pay per mile.

Outcome-based pay was measured as the mean of four items assessing the extent to which differences in pay rates across drivers were based on driver performance, i.e., on driver performance, driver accident rates, traffic violations, and driver fuel mileage. Each item had five response options ranging from (1) Not at All to (5) To a Very Great Extent.

Pay per mile. Pay for number of miles driven is common in the trucking industry (Corsi and Grimm, 1987; Gilroy, 1992) and is arguably a measure of performance-based pay, but paying for miles driven and performance-based pay are not synonymous. The number of miles driven is influenced by scheduling, routing, and other contingencies. Nonetheless, pay per mile was used here since it is an intuitively obvious indicator of performance-based pay. The variable was strongly skewed and was transformed using the arcsine transformation (specifically A=2*arcsine*{sqrt(p)}) for proportions (Cohen and Cohen, 1983). Thus, the variable was operationalized as the arcsine of the percent of drivers paid by the mile.

Control variables. We included several control variables in the analyses. Control variables were organizational *size* (the log of the total number

of employees in the organization), organizational *age* (the log of 1994 minus the founding year of the company [reported in the *Blue Book*]), *unionization* (the percent of drivers currently covered by a collective bargaining agreement), and *carrier type*. Carrier type distinguishes among truckload (TL) organizations (providing service to customers having sufficient volume to load an entire trailer), less-than-truckload (LTL) organizations (serving customers with smaller shipments), and specialized commodity (SC) firms (carrying specific types of loads, e.g., oil or milk). This variable was operationalized as the primary type of business for the company (LTL, TL, or SC). Because SC and TL companies were remarkably similar, they were coded 1 and LTL firms were coded 0.

Analysis strategy. Regression analysis (Cohen and Cohen, 1983) was used to test the hypotheses. We report three models for each dependent variable. The first model contains only the control variables, the second model contains only the independent variables, and the third model contains all independent and control variables. We used Darlington's (1968) usefulness approach to isolate the impact of each predictor separately. Regressions were run with and without a specific predictor, and difference in *R*-squares between the two models provides an estimate of the unique contribution of that predictor. This statistic is analogous to the semi-partial r^2 (Cohen and Cohen, 1983). Standardized regression coefficients are shown in the results tables for each model. The unique difference in *R*-squares is reported only for the full equation.

Response bias and psychometric issues

Following Osterman (1994), we ran a logistic regression to test for differences between respondent and non-respondent companies. We used proxy data from the 1994 *Blue Book* to assess differences between respondent and non-respondent companies on a variety of organizational characteristics (number of drivers, total fringe benefits cost, total highway miles driven, total wages paid, average haul [in miles], total insurance costs, current assets, company age, tons per mile, and average load [in tons]). The dependent variable was dummy coded 1 if a usable questionnaire was returned and 0 if it was not. No organizational characteristic was significant in the equation. We also compared respondents who had usable data on all the variables in the study (294) with those who did not (85). Only one significant difference emerged—companies included in the analyses were more likely to be unionized.

Table 1 contains descriptive information on all variables. All six independent variables used single-item indices, but since they sought relatively factual information, they are unlikely to evince response biases evident with attitudinal items. The intercorrelations among alternative measures of monitoring were, at best, weak (Table 1). These small relationships substantiate that we achieved our goal of targeting *different* aspects of the construct domain.

The validity of the dependent variables is also of concern. The use of two measures of performance-contingent compensation mitigates this concern. Pay per mile is a relatively factual measure, but outcome-based pay is a subjective index. Table 1 shows it to have reasonable reliability. We estimated convergent validity through its correlation with other pay-for-performance measures: 0.29 ($p < 0.01$) with individual incentives based on individual performance, 0.45 ($p < 0.01$) with merit-based pay, and 0.33 ($p < 0.01$) with on-the-spot individual bonuses.

Regression results

The results of the three sets of regressions (control variables alone, independent variables alone, and both control and independent variables) for both dependent variables are shown in Table 2. Of particular interest was the unique explanatory power of each variable ($\Delta R^2_{Variable}$), shown for Model 3 in Table 2. For outcome-based pay, computer tracking ($\beta = 0.148$, $\Delta R^2_{Variable} = 0.018$, $p < 0.05$) was a significant predictor, its positive direction supporting the collaborative perspective (*Hypothesis 1b*). Conversely, longer agent tenure was associated with lower use of outcome-based pay ($\beta = 0.127$, $\Delta R^2_{Variable} = 0.013$, $p < 0.05$), supporting agency theory (*Hypothesis 2a)*. With respect to pay per mile, computer tracking was again a significant predictor ($\beta = 0.121$, $\Delta R^2_{Variable} = 0.014$, $p < 0.05$) consistent with the collaborative perspective (*Hypothesis 1b*), but the remaining monitoring and tenure variables were not significant.

Table 1. Study 1: Descriptive statistics and correlations among all study variables[1,2]

	Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Control Variables														
1. Log Size	4.82	1.24	#											
2. Log Age	3.40	0.63	–0.01	#										
3. Unionization	22.74	40.39	–0.09	0.27**	#									
4. Carrier Type	0.85	0.35	–0.27**	–0.14*	–0.28**	#								
Agent Monitoring														
5. Computer Tracking	42.34	41.38	0.31**	–0.04	–0.12*	0.12*	#							
6. Communication Systems	29.38	37.91	0.14**	–0.02	0.12*	0.01	0.21**	#						
7. Narrow Supervisory Span	4.86	1.07	–0.55**	–0.05	0.06	0.08	–0.17**	–0.03	#					
8. Relays	3.98	12.88	0.22**	–0.06	–0.06	–0.09	0.03	–0.09	–0.20**	#				
9. Schedule Stability	3.06	0.76	–0.01	0.02	0.02	–0.16**	–0.09	0.01	–0.08	0.01	#			
10. Agent Tenure	59.94	25.22	–0.27**	0.23**	0.31**	–0.24**	–0.16**	–0.04	0.13*	–0.04	0.09	#		
Dependent Variables														
11. Outcome-based Pay	2.03	1.07	0.16**	–0.15**	–0.35**	0.07	0.20**	–0.01	–0.12*	–0.02	–0.06	–0.23**	(0.81)	
12. Pay per Mile	1.58	1.24	0.20**	–0.13*	–0.21**	0.19**	0.26**	0.11*	–0.12*	0.08	–0.16**	–0.15**	0.15**	#

[1]**$p < 0.01$; *$p < 0.05$
[2]N = 294

Table 2. Study 1: Regression results[1,2]

	Outcome-based Pay				Pay per Mile			
	Model 1	Model 2	Model 3	$\Delta R^2_{Variable}$	Model 1	Model 2	Model 3	$\Delta R^2_{Variable}$
Control Variables								
Log Size	0.166**		0.038	0.001	0.295**		0.233**	0.030**
Log Age	–0.061		–0.047	0.002	–0.071		–0.068	0.004
Percent Unionized	–0.294**		–0.265**	0.060**	–0.119*		–0.129*	0.014*
Carrier Type	0.046		–0.037	0.001	0.231**		0.184**	0.025**
Independent Variables								
Computer Tracking		0.181**	0.148*	0.018*		0.198**	0.121*	0.012*
Communication Systems		–0.052	–0.016	0.000		0.062	0.074	0.005
Narrow Supervisory Span		–0.077	–0.061	0.003		–0.060	–0.024	0.000
Relays		–0.004	–0.017	0.000		0.095	0.079	0.006
Schedule Stability		–0.036	–0.046	0.002		–0.124*	–0.102	0.009
Agent Tenure		–0.195**	–0.127*	0.013*		–0.090	–0.034	0.001
R^2	0.134**	0.101**	0.171**	#	0.142**	0.102**	0.172**	#
(Adj.R^2)	(0.122)	(0.082)	(0.141)	#	(0.132)	(0.084)	(0.143)	#

[1]Columns labeled Model 1–3 show standardized regression coefficients. The ΔR^2 Variable column shows the ΔR^2 for each variable controlling for all other variables.
[2]*$p < 0.05$; **$p < 0.01$; N = 294

Study 2: Method and results

Sample and measures

The population for this study, conducted at the facility level, was the membership of the American Compensation Association (ACA). The primary criterion for inclusion was that the facility have a compensation plan for an identifiable group of operating employees. A 24-page questionnaire was sent to the top compensation or human resource manager of a sample of 715 facilities. Usable responses were received from 149 respondents, a 21% (149/715) response rate. The responding organizations had a median of 1,341 employees, 64% were service organizations and 27% were unionized. All measures were obtained from the questionnaire.

Agent monitoring. Direct monitoring and job programmability were assessed. We used two direct monitoring measures (close supervision and narrow supervisory span) and one programmability measure (routine work). *Close supervision* was the mean of three items with seven response options, with high scores reflecting higher levels of monitoring. A sample item is "Managers and supervisors work closely with their subordinates." *Narrow supervisory span* was operationalized as the reverse of the number of employees reporting to each first-line supervisor. Higher values indicate a lower span of control. The variable was logged for analysis. *Programmability* was operationalized as *routine work* and assessed the extent to which the work of operating employees was routine as the mean of six items with seven response options. A sample item is "In general, our employees have very routine jobs."

Agent tenure. Agent tenure was measured as the average length of service (in years) of direct production/service employees at the facility.

Performance-contingent pay. Outcome-based pay for production or operating employees was measured as the mean of three items with seven response options. The items assessed the extent to which differences in pay across employees doing the same job were based on quantity of performance, quality of performance, and safety records.

Control variables. Organization *size* (log of the total number of employees), *age* (log of 1996 minus the year the facility began operations), and *unionization* (coded 1 if any operating employees were currently covered under a collective bargaining agreement, and 0 if not) were included as controls, as were three dummy variables assessing the predominant *technology* for each responding organizations. Technology was dummy coded (Cohen and Cohen, 1983)—dummy 1 was coded 1 if the facility was a mass production facility, dummy 2 1 if the facility was continuous process production, dummy 3 1 if the facility was a unit/small batch production, and all three were coded 0 for service facilities. A measure of *environmental stability*, the amount of turbulence or rapid change experienced by the organization, was also included as a control. This variable was the mean of three semantic differential items adapted from Doty, Glick, and Huber (1993) that asked how many important changes in the behavior of suppliers, competitors, and customers/clients had occurred over the past year. Responses ranged from "Few Changes" to "Many Changes." Higher scores on this scale indicate greater environmental stability.

Response bias and psychometric issues

Missing data reduced the analysis sample size to 91. Analyses comparing respondents who had usable data on all the variables of interest in the study (91) with those that did not (58) showed only one significant difference—companies included in the analyses were larger.

Descriptive statistics and correlations among all variables are shown in Table 3. For multiple-item indices, coefficient α reliabilities are shown in the diagonal and are of reasonable magnitude. Single-item predictors in Study 2 also represented factual information; multiple-item indices were adapted from prior research and hung together well. Low intercorrelations among indicators of agent monitoring were expected. Study 2 used one dependent variable—outcome-based pay. This variable correlated 0.58 ($p < 0.01$) with merit-based movement through job classifications, 0.26 ($p < 0.01$) with individual incentives tied to individual performance, and –0.31 ($p < 0.01$) with the extent of time in grade-based movement through job classifications.

Regression results

The results of the regression analyses for Study 2 are contained in Table 4. The first model used control variables only; these variables did not explain significant variance. The independent variables explained about 17% of the variance (Model 2). In Model 3, agent tenure was negatively related to outcome-based pay ($\beta = -0.330$, $\Delta R^2_{\text{Variable}} = 0.078$, $p < 0.01$), supporting agency predictions. Narrow supervisory span was *positively* related to the dependent variable ($\beta = 0.229$, $\Delta R^2_{\text{Variable}} = 0.038$, $p < 0.05$), supporting the collaborative perspective. None of the other independent variables showed significant relationships with the outcome. Overall, Study 2 offers some support for both perspectives—for collaborative predictions in terms of agent monitoring and for agency predictions with respect to agent tenure.

Discussion

The results of the two studies show relatively consistent support for agency predictions regarding agent tenure and tentative support for the collaborative perspective for agent monitoring. The most uniform results concern agent tenure. Actual tenure (which is what we measured) has a similar dynamic to expected tenure (which is what empirical research to date has addressed). In the trucking industry in particular, turnover is severe. Driver turnover rates range from 38% (Corsi and Fanara, 1988) to 200%, as contrasted to the national average of about 8% (Bureau of National Affairs, 1993). Skilled long-service drivers are in great demand. As trucking firms gather information over time about drivers, they apparently reduce drivers' risk in the employment relationship by relying less on performance-based pay. These companies may also *expect* a long-term relationship and therefore place less emphasis on performance-contingent compensation from the outset (Stroh et al., 1996).

The results are relatively consistent, but not as clear cut, with respect to collaborative predictions about agent monitoring. In the trucking sample, computer tracking was associated with more outcome-based pay and more pay per mile; in the cross-industry sample, narrow supervisory span was associated with more outcome-based pay. One explanation of these difference lies in vari-

Table 3. Study 2: Descriptive statistics and correlations among all study variables[1,2]

	Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.	8.	9.
Control Variables											
1. Log Size	6.77	1.69	#								
2. Log Age	3.48	0.94	0.41**	#							
3. Unionization	0.21	0.42	0.24*	0.22*	#						
4. Environmental Stability	3.21	1.39	–0.16	–0.08	0.07	(0.78)					
Agent Monitoring											
5. Close Supervision	4.39	1.31	0.09	0.02	0.15	–0.01	(0.69)				
6. Narrow Supervisory Span	2.22	0.79	–0.21*	–0.19	–0.11	0.29**	0.04	#			
7. Routine Work	4.14	1.09	0.16	0.22*	0.11	0.20	0.04	–0.05	(0.82)		
8. Agent Tenure	8.46	4.17	0.06	0.35**	0.33**	0.12	–0.06	–0.11	–0.07	#	
9. Outcome-based Pay	4.48	2.03	–0.18	–0.12	–0.25*	–0.07	–0.08	0.18	0.01	–0.35**	(0.82)

[1]**$p < 0.01$; *$p < 0.05$
[2]$N = 91$

Table 4. Study 2: Hierarchical regression results[1,2]

	Outcome-based Pay			
	Model 1	Model 2	Model 3	$\Delta R^2_{Variable}$
1. *Control Variables*				
Dummy 1 (Mass Production)	–0.047		0.064	0.003
Dummy 2 (Continuous Process)	–0.116		–0.032	0.001
Dummy 3 (Unit/Small Batch)	0.154		0.181	0.028
Log Size	–0.088		–0.122	0.011
Log Age	0.003		0.131	0.012
Unionization	–0.207		–0.113	0.010
Environmental Stability	–0.022		0.060	0.003
2. *Independent Variables*				
Close Supervision		–0.026	–0.038	0.001
Narrow Supervisory Span		0.208*	0.229*	0.038*
Routine Work		–0.007	0.073	0.004
Agent Tenure		–0.328**	–0.330**	0.078**
R^2	0.122	0.168**	0.240*	#
(Adj.R^2)	(0.046)	(0.128)	(0.132)	#

[1]Columns labeled Model 1–3 show standardized regression coefficients. The ΔR^2 Variable column shows the ΔR^2 for each variable controlling for all other variables.
[2]*$p < 0.05$; **$p < 0.01$; $N = 91$

ations in work organizations across the two settings. In the trucking industry, dispatchers in charge of a few drivers may not have more face-to-face contact with drivers than dispatchers monitoring many drivers. This may reduce the efficacy of work design types of monitoring (supervisory span, relays, and scheduled stability), precluding the development of the cooperative relationships suggested by the collaborative perspective (Conlon and Parks, 1990); it may also minimize the personal "checking up" suggested by agency theory. By contrast, sophisticated computer tracking equipment drastically changes the nature of over-the-road driving, enabling monitoring of drivers thousands of miles away. Computer tracking, not supervisory span, may be salient in trucking for controlling employee behaviors.

The cross-industry sample represents a more traditional organization of work. Production and service employees typically spend more time with their first-line supervisors and managers. A smaller supervisory span may indeed foster cooperation and partnership, increasing the use of performance-contingent compensation. These differences highlight the need for caution in extrapolating from single- or cross-industry studies in isolation, provide an interesting contrast between the types of monitoring and their associations, and underscore differences between person versus electronic monitoring in different contexts.

We used job programmability as an indicator of agent monitoring, following agency theory research (e.g., Eisenhardt, 1988; Stroh et al., 1996). Programmability indicators were not significant predictors in either study, although agency arguments about job programmability were supported indirectly by the significant relationship between carrier type (a control variable) and pay per mile. Typically, TL drivers are paid by the mile more often than are LTL drivers. LTL drivers are more likely to have regular routes, central distribution points, and ongoing contact with dispatchers and supervisors. The lower programmability of TL jobs may account for the institutional forces that encourage the use of pay per mile in this segment; the higher programmability of LTL jobs reduces such institutional forces. Taken together, the two studies suggest, at best, weak programmability effects, perhaps because of the specific operationalizations we used (e.g., in the trucking study, carrier type and other programmability measures were only modestly related), or perhaps because programmability plays a more peripheral role in principal-agent relationships at the organizational level. Organizational-level agency research is rare, and problems of cross-level inference (e.g., Mossholder and Bedeian, 1983) may account for inconsistencies between our results and those of other agency research.

Specific methodological constraints of our two studies are potential explanations of our results. The data sets are open to the question generalizability, but our use of single-industry and cross-industry contexts alleviates this concerns. Using two samples was prudent, since the results indicate that interpretations from single-industry studies must be circumscribed. This is a useful lesson, not only for agency and collaborative predictions, but also for strategic human resource management in general, which tends to rely on single-industry samples (e.g., Arthur, 1994; Delery and Doty, 1996). Industry controls in our studies should also reduce generalizability concerns. Of particular note is that participating organizations in Study 2 were facilities and possibly part of multi-facility or multi-division firms. Unfortunately, we could not investigate the influence of corporate dependence (Dean and Snell, 1991) on job programmability and compensation decisions.

The studies were cross-sectional in nature and, like much other macro-organizational and strategic research, we relied primarily on key informant reports. Information on significant variables was unavailable archivally, and our key informants were selected precisely because they were uniquely qualified to report on critical variables. As Starbuck and Mezias (1996) point out, even archival data are reported by someone, presumably someone as uniquely qualified as our respondents were. Nevertheless, crossing data sources would be useful. The response rate in the cross-industry study was not ideal, and missing data reduced the analysis sample even more. Statistical power loss and weakened comparability to the original population are two concerns emanating from this limitation. The construct validity of our measures is also open to question. We analyzed the psychometric properties of our measures; the results mitigate psychometric concerns. Our data sets did not contain a measure of the percent of variable compensation, an operationalization often used in agency studies. Although the psycho-

metric properties of our measures seem sound, it would be useful to compare our results with those obtained using percent of at-risk pay as the dependent variable.

Substantively, our results highlight the utility of both agency and collaborative perspectives in organizational research. That the results showed variations across the two studies indicates that *both* collaborative and agency arguments have merit, but not universally so. When our results are juxtaposed against the similar inconsistent results of Parks and Conlon (1995), it is clear that the two theories must be integrated—neither is necessarily *completely* right; instead, an identification of contingencies and boundaries for applicability of each should lead to significant substantive advances.

One such contingency is likely whether the theory focuses primarily on the principal or the agent. Agency theory concerns the *principals*' actions in making compensation arrangements depending on their knowledge of the agent behavior, but these actions are grounded in the assumption that agents are risk-averse. The collaborative perspective primarily describes the *agent's* willingness to accept compensation risk given various factors, while also making different predictions than agency theory about the actions of the principal in the same situation. Thus, agency theory holds the preference of the agent constant (self-interested and risk averse), focusing only on the actions of the principal. The collaborative view concerns the actions of both parties. Although they generally make opposing predictions, the perspectives are not asymmetrical conceptually. Longer tenured agents may be more willing to accept compensation risk, while *simultaneously* principals prefer to implement a behavior-based compensation arrangement. The theoretical resolution of these issues probably hinges on whether only principals (according to agency theory) or both parties (according to collaborative perspective) respond to information-based contractual situations. These possibilities may have contributed to the inconsistent results in this study and the Parks and Conlon (1995) study.[1] Indeed, stewardship theory (e.g., Davis, Schoorman and Donaldson, 1997; Donaldson and Davis, 1991) and the behavioral agency model (Wiseman and Gomez-Mejia, 1998), when considered alongside agency and collaborative perspectives may lead to a more valid and synthesized model to explain compensation arrangements.

In sum, this study makes several significant contributions. It synthesizes agency predictions across disciplines and applies them to organizational-level compensation arrangements. It is among the first direct empirical examinations, and the first direct *field* examination, of the collaborative perspective proposed by Parks and Conlon (1995). It supports, extends, and refutes aspects of both agency and collaborative perspectives, and highlights the centrality of situational contingencies. It is among the rare studies focusing on compensation systems for key employee groups rather than CEOs, other top-level managers, or sales forces. Accepting the risks of performance-based compensation may be easy and normative for higher-level executives with large salaries, golden parachutes, and other contractual cushions. Production employees and truck drivers seldom have such luxuries. Overall, future research must address both issues of organizational-level compensation dynamics, and issues of the precise specification of the contingencies in principal-agent relationships. This study offers an initial step in that direction; we hope it enriches the scientific data base.

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REFERENCES

Allison, G. T. (1971). *Essence of Decision*. Little, Brown, Boston, MA.

Anderson, E. and R. L. Oliver (1987). 'Perspectives on behavior-based versus outcome-based salesforce control systems', *Journal of Marketing*, **51**(4), pp. 76–88.

Arthur, J. B. (1994). 'Effects of human resource sys-

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tems on manufacturing performance and turnover', *Academy of Management Journal*, **37**, pp. 670–687.
Basu, A., R. Lal, V. Srinivasan and R. Staelin (1985). 'Salesforce compensation plans: An agency theoretic perspective', *Marketing Science*, **4**, pp. 267–291.
Beatty, R. P. and E. Zajac (1994). 'Managerial incentives, monitoring, and risk bearing: A study of executive compensation, ownership, and board structure in initial public offerings', *Administrative Science Quarterly*, **39**, pp. 313–335.
Bloom, M. and G. Milkovich (1998). 'Relationships among risk, incentive pay, and organizational performance', *Academy of Management Journal*, **41**, pp. 283–298.
Bradach, J. L. and R. G. Eccles (1989). 'Price, authority, and trust: From ideal types to plural form', *Annual Review of Sociology*, **15**, pp. 97–118.
Bureau of National Affairs (1993). 'Quarterly report on job absence and turnover', *Bulletin to Management*.
Carmichael, H. L. (1983). 'The agent-agents problem: Payment by relative output', *Journal of Labor Economics*, **1**, pp. 50–65.
Cohen, J. and P. Cohen (1983). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. Erlbaum, Hillsdale, NJ.
Conlon, E. J. and J. M. Parks (1990). 'Effects of monitoring and tradition on compensation arrangements: An experiment with principal-agent dyads', *Academy of Management Journal*, **33**, pp. 603–622.
Corsi, T. and P. Fanara (1988). 'Driver management policies and motor carrier safety', *The Logistics and Transportation Review*, **24**, pp. 153–164.
Corsi, T. and C. M. Grimm (1987). 'Changes in owner-operator use, 1977–1985: Implications for management strategy', *Transportation Journal*, **3**(3), pp. 4–16.
Creed, W. E. D. and R. E. Miles (1996). 'Trust in organizations: A conceptual framework linking organizational forms, managerial philosophies, and the opportunity costs of controls'. In R. M. Kramer and T. R. Tyler (eds.), *Trust in Organizations: Frontiers of Theory and Research*. Sage, Thousand Oaks, CA, pp. 16–38.
Darlington, R. B. 1968. 'Multiple regression in psychological research and practice', *Psychological Bulletin*, **69**, pp. 161–182.
Davis, J. H., F. D. Schoorman and L. Donaldson (1997). 'Toward a stewardship theory of management', *Academy of Management Review*, **22**, pp. 20–47.
Dean, J. W., Jr. and S. A. Snell (1991). 'Integrated manufacturing and job design: Moderating effects of organizational inertia', *Academy of Management Journal*, **34**, pp. 776–804.
Delery, J. E. and D. H. Doty (1996). 'Modes of theorizing in strategic human resource management: Tests of universalistic, contingency, and configurational performance predictions', *Academy of Management Journal*, **39**, pp. 802–835.
Donaldson, L. and J. H. Davis (1991). 'Stewardship theory or agency theory: CEO governance and shareholder returns', *Australian Journal of Management*, **16**, pp. 49–64.
Doty, D. H., W. H. Glick and G. P. Huber (1993). 'Fit, equifinality, and organizational effectiveness: A test of two configurational theories'. *Academy of Management Journal*, **36**, pp. 1196–1250.
Eisenhardt, K. M. (1988). 'Agency- and institutional-theory explanations: The case of retail sales compensation', *Academy of Management Journal*, **31**, pp. 488–511.
Eisenhardt, K. M. (1989). 'Agency theory: An assessment and review', *Academy of Management Review*, **14**, pp. 57–74.
Feyerabend, P. K. (1981). *Realism, Rationalism and Scientific Method.* Cambridge University Press, Cambridge, U.K.
Gambetta, D. (1988). 'Can we trust trust?' In D. Gambetta (ed.), *Trust: Making and Breaking Cooperative Relations*. Basil Blackwell, Oxford, U.K. pp. 213–237.
Gilroy, R. (1992). 'Wooing and winning drivers is No. 1 priority for truckload carriers', *Traffic World*, **229**(3), pp. 21–23.
Gomez-Mejia, L. R. and D. B. Balkin (1992). 'Determinants of faculty pay: An agency theory perspective', *Academy of Management Journal*, **35**, pp. 921–955.
Gomez-Mejia, L. and R. M. Wiseman (1997). 'Reframing executive compensation: An assessment and outlook', *Journal of Management*, **23**, pp. 291–374.
Holmstrom, B. (1979). 'Moral hazard and observability', *Bell Journal of Economics*, **10**, pp. 74–91.
Holmstrom, B. (1982). 'Moral hazard in teams', *Bell Journal of Economics*, **13**, pp. 324–340.
Jensen, M. C. (1983). 'Separation of ownership and control', *Journal of Law and Economics*, **26**, pp. 301–325.
Jensen, M. C. and M. W. Meckling (1976). 'Theory of the firm: Managerial behavior, agency costs, and ownership structure', *Journal of Financial Economics*, **3**, pp. 305–360.
Keeley, M. (1980). 'Organizational analogy: A comparison of organismic and social contract models', *Administrative Science Quarterly*, **25**, pp. 337–361.
Kramer, R. M., M. B. Brewer and B. A. Hanna (1996). 'Collective trust and collective action: The decision to trust as a social decision'. In R. M. Kramer and T. R. Tyler (eds.), *Trust in Organizations: Frontiers or Theory and Research*. Sage, Thousand Oaks, CA, pp. 357–389.
Lambert, R. A., D. F. Larcker and K. Weigelt (1993). 'The structure of organization incentives', *Administrative Science Quarterly*, **38**, pp. 438–461.
MacNeil, I. R. (1978). 'Contracts: Adjustments of long-term economic relationship under classical, neoclassical, and relational contract law', *Northwestern University Law Review*, **72**, pp. 854–906.
Mahoney, J. T., A. S. Huff and J. O. Huff (1994). 'Toward a new social contract theory in organization science', *Journal of Management Inquiry*, **3**, pp. 153–168.
Mandel, M. J. (8 May 1995). 'Help wanted for less pay', *Business Week*, p. 28.

Mossholder, K. W. and A. G. Bedeian (1983). 'Cross-level inference and organizational research: Perspective on interpretation and application', *Academy of Management Review*, **8**, pp. 547–558.

Oliver, R. L. and E. Anderson (1994). 'An empirical test of the consequences of behavior- and outcome-based sales control systems', *Journal of Marketing*, **58**(4), pp. 53–68.

Osterman, P. (1994). 'How common is workplace transformation and who adopts it?', *Industrial and Labor Relations Review*, **47**, pp. 173–188.

Parks, J. M. and E. J. Conlon (1995). 'Compensation contracts: Do agency theory assumptions predict negotiated agreements?', *Academy of Management Journal*, **38**, pp. 821–838.

Ring, P. S. and A. H. Van de Ven (1992). 'Structuring cooperative relationships between organizations', *Strategic Management Journal*, **13**(7), pp. 483–498.

Ross, R. (1973). 'The economic theory of agency: The principal's problem', *American Economic Review*, **63**, pp. 134–139.

Rousseau, D. M. and J. M. Parks (1993). 'The contracts of individuals and organizations', *Research in Organizational Behavior*, **15**, pp. 1–43.

Simon, H. (1991). 'Organizations and markets', *Journal of Economic Perspectives*, **5**, pp. 25–44.

Sonnenfeld, J. A., M. A. Peiperl and J. P. Kotter (1988). 'Strategic determinants of managerial labor markets: A career systems view', *Human Resource Management*, **27**, pp. 369–388.

Starbuck, W. A. and J. M. Mezias (1996). 'Opening Pandora's box: Studying the accuracy of managers' perceptions', *Journal of Organizational Behavior*, **17**, pp. 99–117.

Stiglitz, J. E. (1974). 'Incentives and risk sharing in sharecropping', *Review of Economic Studies*, **61**, pp. 219–256.

Stroh, L. K., J. M. Brett, J. P. Baumann and A. H. Reilly (1996). 'Agency theory and variable pay compensation strategies', *Academy of Management Journal*, **39**, pp. 720–737.

Tosi, H. L., Jr. and L. R. Gomez-Mejia (1994). 'CEO compensation monitoring and firm performance', *Academy of Management Journal*, **37**, pp. 1002–1016.

Watts, R. and J. Zimmerman (1986). *Positive Accounting Theory*. Prentice-Hall, Englewood Cliffs, NJ.

Westphal, J. D. and E. J. Zajac (1994). 'Substance and symbolism in CEOs' long-term incentive plans', *Administrative Science Quarterly*, **39**, pp. 367–390.

Williamson, O. E. (1985). *The Economic Institutions of Capitalism*. Free Press, New York.

Wiseman, R. M. and L. R. Gomez-Mejia (1998). 'A behavioral agency model of managerial risk taking', *Academy of Management Review*, **23**, pp. 133–153.