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The Difference Between Perceptual and Objective Performance Measures: An Empirical Analysis

Kusum L. Ailawadi, Rajiv P. Dant, and Dhruv Grewal

Perceptual performance measures can offer rich insight, but some researchers question their validity. Here, authors used subjective and objective performance measures to tease out the influences of measurement instrument, response style, and respondents' psychological processes in a study of channel performance.

Report Summary

The impact on performance of important marketing constructs such as market orientation, customer satisfaction, and relationship quality must often be studied using self-reported, perceptual measures. However, bias due to common method variance—which results when a single measurement method is used to measure multiple constructs at once—can pose serious problems for researchers.

Here, authors Ailawadi, Dant, and Grewal seek to tease out the effects of different sources of common method variance in a study of channel performance. They econometrically separate the influence of measurement instrument format and response styles, which are stable over time and bias all estimated relationships uniformly, from respondents' psychological processes (positive illusions, cognitive consistency, and self-serving attributions) that bias some estimated relationships differently from others.

Their context is the channel relationship between a large North American company and

the independent agents who sell the company's products. Using five years of surveys, they measured agents' perceptions of their own capabilities, the principal's capabilities, the quality of their relationship with the principal, the external business environment, and their own performance, and compared these perceptual measures with objective performance data from the same time period.

Significant differences were found between perceived performance and objective performance; these differences were consistent with predictions of psychological processes like positive illusions and cognitive consistency as well as predictions of self-serving attributions in individuals.

Perceived-performance measures are indispensable in certain areas of study, but researchers who use them need to make sure to minimize sources of common method variance that may bias the estimated relationship of performance with other variables of interest, as well as improve the accuracy of subjective or self-report measures. ■

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Introduction

Several important marketing constructs, such as market orientation, culture, innovation, customer satisfaction, and relationship quality, are difficult to measure and even more difficult to relate to firm performance. To study these constructs, researchers have to develop and validate perceptual measures for them and then gather data through self-report surveys. More important, because objective performance data, especially for comparable units of analysis, are difficult to obtain, researchers often rely on self-reported, perceptual measures of performance. Perceptual performance measures are not only necessary but also desirable in many situations.¹ For instance, they may encompass important dimensions such as long-term orientation, citizenship, employee morale etc. that are not reflected in commonly used objective measures of performance (Anderson 1990; Jaworski and Kohli 1993; Kumar, Stern, and Achrol 1992), and they may be more comparable across international contexts than are most objective measures based on accounting data (Deshpandé and Farley 2003; Farley 2004). But perceptual measures of performance and its antecedents also have the potential to introduce inaccuracy and bias, which the researcher needs to guard against.

Mezias and Starbuck (2003), among others, have shown that managers are not very accurate in their judgments of performance. However, neither random inaccuracy nor systematic mean-shifts (e.g., everybody thinks and/or claims that their performance is better than it really is) in perceptions of performance pose a serious problem for the researcher who wishes to study the relationship between performance and other marketing variables. More serious is the bias that can occur due to common method variance, when perceptions of performance and other variables of interest to the researcher are obtained from the same respondents using the same measurement method (Bagozzi and Yi 1991; Campbell and Fiske 1959; Podsakoff et al. 2003). Instrument characteristics such as item and scale format and respondent charac-

teristics such as response styles affect all measured constructs uniformly and inflate the correlation between them (Baumgartner and Steenkamp 2001), but people's perceptions of several constructs are also influenced by psychological processes like positive illusions, cognitive consistency, and self-serving attribution bias, whose impact depends on the research context and the other variables that are being measured along with performance. As we will discuss subsequently, the bias generated by these processes differs across variables and may be asymmetrically related to whether people will overestimate or underestimate their performance.

Researchers certainly recognize the general problem of common method variance. Cote and Buckley (1987) and Williams, Cote, and Buckley (1989) have shown that common method variance is a significant portion of the total variance in measured constructs; Bagozzi and Yi (1991), Bollen and Paxton (1998), and Podsakoff et al. (2003) have evaluated confirmatory-factor-analysis-based and other statistical approaches to isolate its impact; and Baumgartner and Steenkamp (2001) have demonstrated how a specific source of common method variance—response styles—can be assessed and controlled for. However, as Baumgartner and Steenkamp (2001) note, few empirical studies in marketing control for bias due to common method variance. And, to the best of our knowledge, none of them separate out the effects of different sources of common method variance or examine the direction and magnitude of their impact on the individual variables whose relationship with performance is being studied.

In this paper, we empirically examine the impact of different sources of common method variance in the context of the channel relationship between a principal and its independent agents. Our objective is to (1) quantify the extent of bias due to all sources of common method variance in the channel context; (2) econometrically separate the influence of sources such as measurement instrument

format and response styles, which are stable over time and bias all estimated relationships uniformly, from respondents' psychological processes, which bias some estimated relationships differently from others; and (3) predict the direction of these differential biases and test for their presence. We conduct our analysis using five years of annual data on agents' perceptions of their performance as well as other constructs pertaining to the channel interaction that have been studied in the literature, combined with objective data on the performance of the same agents during the same period.

We want to note at the outset that "objective" performance measures may not always be the ideal against which perceptual measures must be validated, especially if the latter span more and/or different dimensions than the former (Jaworski and Kohli 1993; Podsakoff and MacKenzie 1994). This paper deals with situations in which the perceived-performance measure is supposed to span the same dimension(s) as the objective measure.

The rest of this paper is organized as follows. The next section describes the data and measures we use for our empirical analysis. Then, we present the conceptual framework underlying our analysis and develop hypotheses about the direction of bias in the estimated relationships between various channel constructs and perceived performance. We present the results of our empirical investigation and conclude the paper with a discussion of our findings and their implications for researchers.

Data and Measures

Data

The data used in this research relate to the independent agents of a large North American company and span a five-year period, from 1996 through 2000. The agents sell the company's products through a catalog and are paid a fixed percentage of their net sales each

year in commissions. Each year, all of the agents were asked to complete a survey as part of the formal interaction between the principal (retailer) and the agents. The primary motivation for these annual surveys was the principal's desire to understand how to manage and communicate with the network of its independent agents efficiently and effectively without direct ownership of the agencies. The measures in the survey include, apart from demographic information, perceptions of (1) the agent's capabilities; (2) the principal's capabilities; (3) the quality of the agent's relationship with the principal; (4) the external business environment facing the agent; and (5) the agent's performance. We merged these survey data with objective performance data for each agent obtained directly from the principal's financial records and with demographic information about the geographic region served by the agent taken from census data. The appendix lists the definitions/scales for all of the constructs used in our analysis, along with the literature sources from which they have been adapted.

These data have several unique features that make them useful for the purposes of our research. First, since this annual survey is part of the company's formal interaction with its agents, response rates are good, and the quality of the data should be high. Second, the objective measure of performance, annual net sales dollars (i.e., gross sales dollars less returns), is obtained directly from company records and is very accurate. In fact, it is used to compute the commissions remitted to the agents each year, so it is highly relevant to both the principal and agents and less likely to suffer from accounting problems than measures in annual reports and other public sources. Third, the measure of perceived performance also taps into financial performance, which avoids a "mismatch" with the objective measure, because they are not tapping fundamentally different dimensions of performance. Fourth, we have longitudinal data that allow us to examine lagged effects and changes in variables, control for sources of common method variance that are stable over

time, and find out if perceptual accuracy improves over time.

The survey was sent to all of the principal's agents each year, and response rates in each year are summarized below.

Year	No. of Surveys Sent	Response Rate
1996	1,308	37%
1997	1,342	52%
1998	1,363	60%
1999	1,528	55%
2000	1,646	53%

We do not have five full years of data on all of the agents, however, due to agent turnover and incomplete census data. Our analysis is based on all complete observations, i.e., all agents in a given year for whom we have data on all relevant variables. We provide below some summary statistics about the responding sample of agents as well as the subset in the final analysis.

Characteristic	Respondents	Final Sample
Total number of observations	3,557	1,717
Total number of agents	1,409	561
% providing three or more years of data	46%	59%
Average age of agency in years	7.5	7.9
% past employees of the principal	7.5%	6.6%
Average number of full-time-equivalent employees	3.0	2.9
Average square footage dedicated to principal	396	357

Perceptual measures

Scales for most of the constructs in the survey are adapted from the literature, as noted in the appendix. Table 1 provides descriptive statistics for all of the constructs, several of which are categorized into four higher-order groups—agent capabilities, principal capabilities, relationship quality, and environmental flux. The table also reports their composite reliabilities, all of which are very high. Table 2 provides the average intraconstruct and interconstruct item correlations for all of the constructs. The diagonal elements in the table are the average correlations between all pairs of items within a

construct, and the off-diagonal elements are the average correlations between all pairs of items across two constructs. The diagonal correlations are all strong and of higher magnitude than the off-diagonal correlations. In addition, the off-diagonal correlations that correspond to constructs within a given higher-order group are somewhat stronger than others. This is not surprising since the constructs within a group should share more variance with one another than with constructs in other groups.

We also conducted confirmatory factor analysis for each year of data to assess the measurement quality of the constructs (Bagozzi and Yi 1988; Jöreskog and Sörbom 1999; Steenkamp and van Trijp 1991). Apart from estimating models for one construct at a time, we also estimated two other sets of measurement models. First, we estimated four single-factor models in which all items across all constructs in a given group were assumed to be indicators of a single factor, e.g., agent capabilities. Second, we estimated four second-order factor models that evaluated all of the constructs within each group, assuming that each individual construct in a group was in turn an indicator of a second-order factor. Table 3 summarizes the fit of these models and also provides the results of a χ^2 test that compares the second-order factor models to the corresponding single-factor models.²

As the table shows, the fit of the second-order factor models is within acceptable limits for all of the groups. The Comparative Fit Index (CFI), the Non-Normed Fit Index (NNFI), and Root Mean Square Residual (RMSR) (Bentler and Bonnett 1980; Hair et al. 1998; Tucker and Lewis 1973) support the theoretical structures specified in the models quite well. The χ^2 test rejects the single-factor structures in favor of the second-order factor structures in all cases, thus providing further evidence of the validity of the constructs in each group. Although we don't report them, all items load strongly onto the prespecified constructs, and their *t*-statistics are highly significant.

Table 1
Descriptive Statistics of Constructs

Construct	No. of Items	Composite Reliability	Mean	Standard Deviation
Agent Capabilities (AGENTCAP):				
Customer orientation	3	.85	4.54	.48
Adaptation	3	.81	4.13	.59
Service quality	4	.83	4.47	.46
Competence	3	.75	4.00	.62
Compliance	3	.73	4.26	.49
Principal Capabilities (PRINCAP):				
Service quality	3	.77	4.19	.52
Operational support	4	.83	4.21	.58
Product quality	7	.92	3.97	.50
Trustworthiness	6	.96	4.26	.56
Relationship Quality (RELTNSHP):				
Flexibility	4	.92	3.82	.67
Mutuality	4	.92	3.64	.74
Conflict norms	4	.81	3.56	.63
Distributive justice	4	.91	3.22	.74
Cooperation	7	.97	4.12	.54
Environmental Flux (ENVFLUX):				
Diversity	5	.92	3.99	.55
Dynamism	4	.96	3.32	.77
Environmental Capacity (ENVCAP):				
Capacity	5	.83	3.99	.55
Agent Performance (PERPERF):				
Perceived performance	5	.96	3.65	.84

Objective performance measure

Net sales is a simple, unidimensional outcome measure of performance that is important for both the principal and the agents, because it reflects the culmination of the efforts of both parties, and because the agents' revenue is a fixed percentage of their net sales. To make the net-sales measure directly comparable with the perceived performance measure, which, in line with general practice in the literature, asks agents to rate their performance relative to other similar agents, we convert net sales into an objective sales measure relative to other similar agents. "Similarity" may be in agent demographics, such as how long the agent has represented the principal, or in market demo-

graphics, such as the sales potential of the region. Therefore, we estimate a benchmark sales level for each agent based on market and agent demographics, and we compute the difference between the agent's actual sales and benchmark sales. This difference, which we term "adjusted sales" (*ADJSLS*), is the objective relative performance measure. Clearly, the larger the adjusted-sales measure, the better the agent's performance relative to other similar agents. We obtain each agent's benchmark sales, i.e., the average sales of an agent with the same demographics, as the predicted value from the following regression of net sales on agent and market demographics and a *YEAR* variable to account for any time trend in sales:

Table 2

Average Intraconstruct and Interconstruct Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Agent Capabilities																			
Customer orientation	1	.56																	
Adaptation	2	.37	.53																
Service quality	3	.35	.29	.53															
Competence	4	.26	.27	.30	.45														
Compliance	5	.29	.29	.33	.39	.48													
Principal Capabilities																			
Service quality	6	.23	.16	.25	.20	.22	.52												
Operational support	7	.22	.16	.18	.15	.16	.38	.46											
Product quality	8	.16	.19	.18	.23	.21	.26	.24	.48										
Trustworthiness	9	.31	.24	.27	.21	.25	.38	.44	.33	.70									
Relationship Quality																			
Flexibility	10	.19	.24	.14	.25	.26	.20	.25	.21	.32	.62								
Mutuality	11	.19	.21	.12	.24	.22	.23	.22	.26	.38	.43	.61							
Conflict norms	12	.12	.18	.06	.14	.12	.09	.10	.12	.13	.24	.28	.51						
Distributive justice	13	.11	.12	.08	.12	.13	.24	.22	.22	.26	.24	.39	.15	.58					
Cooperation	14	.24	.21	.20	.20	.24	.24	.27	.23	.37	.26	.32	.20	.29	.70				
Environmental Flux																			
Diversity	15	.09	.14	.08	.11	.10	.06	.10	.10	.12	.17	.13	.09	.09	.11	.42			
Dynamism	16	.17	.17	.12	.13	.19	.08	.08	.14	.12	.15	.11	.12	.07	.19	.21	.62		
Environmental Capacity																			
Capacity	17	-.03	.03	-.02	.05	-.02	-.01	-.02	.02	-.01	.11	.06	.09	.0	-.01	.17	.07	.73	
Agent Performance																			
Perceived performance	18	.19	.21	.24	.30	.25	.17	.15	.20	.22	.20	.24	.16	.13	.23	.20	.14	.04	.71

Note: The diagonal entries are the average intraconstruct correlations, and the off-diagonal entries are average interconstruct correlations.

$$\begin{aligned}
 NETSALES_{it} = & \beta_0 + \beta_1 AGE_{it} + \beta_2 FTE_{it} \\
 & + \beta_3 SQFT_{it} + \beta_4 RETDIST_{it} + \beta_5 MKTDIST_{it} \\
 & + \beta_6 POP_i + \beta_7 TOTSPEND_i + \beta_8 YEAR_t + \varepsilon_{it} \\
 ADJSLS_{it} = & NETSALES_{it} - NETSALES_{it}
 \end{aligned}
 \tag{1}$$

where

AGE_{it} = Number of years the respondent i has been an agent of the principal at year t

FTE_{it} = Number of full-time-equivalent employees the agent has dedicated to the principal's business

$SQFT_{it}$ = Number of square feet of space the agent has dedicated to the principal's business

$RETDIST_{it}$ = Distance from the agent to the nearest store owned by the principal

$MKTDIST_{it}$ = Distance from the agent to the nearest set of shops (market)

POP_i = Population of the region where the agent is located in 2001

$TOTSPEND_i$ = Total spending on similar products per household in the agent's region in 2001

$YEAR$ = Year of data, 1996 to 2000

Adjusted R^2 for the regression is .25, and the F -statistic is highly significant ($p < .0001$) at

71.94. Two points deserve mention about this $ADJSLS$ measure. First, the less-than-perfect explanatory power of this model should not be

Table 3
Comparison of Measurement Models

Construct Group	No. of Factors	χ^2 (df)	NNFI	CFI	RMSR	$\Delta \chi^2$ (df)
Single-Factor Structure Tests						
Agent capabilities	1	878.43 ₍₁₀₄₎	.67	.72	.04	NA
Principal capabilities	1	1,203.5 ₍₁₆₃₎	.75	.79	.04	NA
Relationship quality	1	2,798.0 ₍₂₂₇₎	.55	.59	.10	NA
Environmental flux	1	1,115.9 ₍₂₄₎	.42	.61	.18	NA
Second-Order Factor Structure Tests						
Agent capabilities	5	353.87 ₍₉₉₎	.89	.91	.03	524.56(5)*
Principal capabilities	4	397.14 ₍₁₅₉₎	.94	.95	.02	806.36(4)*
Relationship quality	5	490.69 ₍₂₂₂₎	.95	.96	.03	2,307.31(5)*
Environmental flux	2	NA	NA	NA	NA	NA

* $p < .01$ for the difference in χ^2 relative to the corresponding single-factor model.

troubling: It simply highlights the fact that an agent's sales are not driven by demographic factors alone. If demographics alone explained a large portion of the variance in sales across agents, there would be little left for observed factors, such as capabilities, effort, and channel relationship, or unobserved factors, such as firm-specific skills and resources, to explain. Second, although a simpler way to convert net sales into a relative measure would be to divide by average sales across all agents in each year, we want an objective measure relative to other *similar* agents, not relative to *all* other agents, and that is why we report results in this paper based on *ADJSLS*. However, when we repeated our analyses with relative sales, although there were some differences across the measures, our substantive findings were largely the same.

Conceptual Framework and Hypotheses

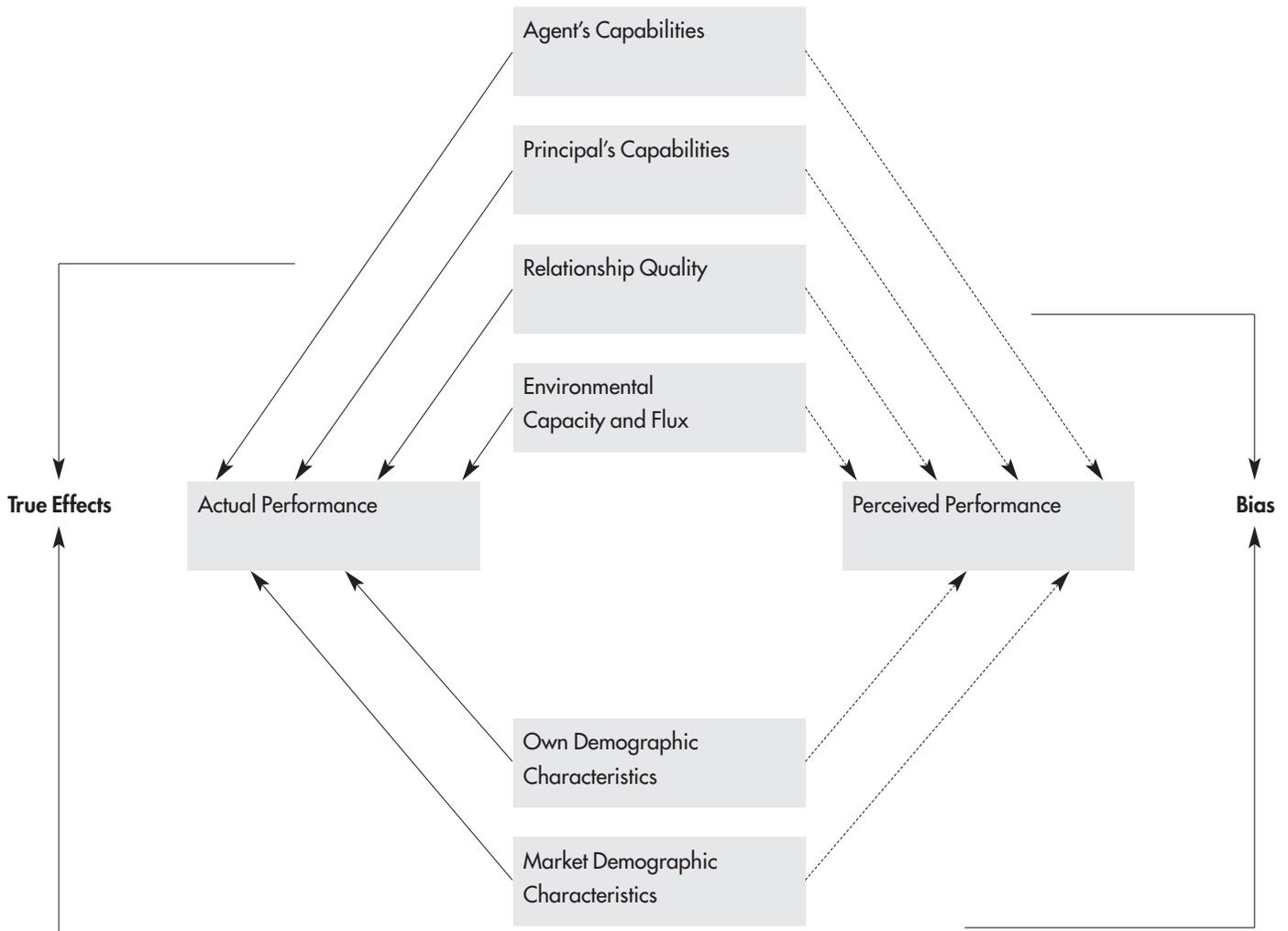
Conceptual framework

Performance of agents may be influenced by five key sets of factors, based on the literature (e.g., Bello and Gilliland 1997; Cannon and Perreault 1999; Gatignon and Xuereb 1997; Jap 1999; Lusch and Brown 1996; Verhoef 2003): (1) the agents' own capabilities (*AGENTCAP*,

e.g., customer orientation, product/service quality, competence); (2) the principal's capabilities (*PRINCAP*, e.g., product/service quality, operational support); (3) the quality of the relationship between them (*RELTNSSH*, e.g., flexibility, cooperation, mutuality); (4) the nature of the environment in terms of its capacity (*ENVCAP*) and flux (*ENVFLUX*, e.g., dynamism and diversity); and (5) demographic characteristics of the agents (e.g., length of experience with principal, space, and employees invested in business).

Figure 1 represents the relationship of these five sets of factors with actual (objective) and perceived performance and also shows that actual performance directly determines agents' perceived performance. It can be proved econometrically that, if the perceived-performance measure is perfectly valid, it should be completely determined by actual performance (with the exception of random measurement error); the impact of any other antecedent factors on perceived performance should occur only through their effect on actual performance. As shown in the figure, any direct effect on perceived performance that does not go through actual performance is evidence of bias due to method variance shared between perceived performance and the antecedent factors. Therefore, we can

Figure 1
Conceptual Framework



test for the existence and extent of bias due to common method variance by estimating the following regression model and examining whether the estimates of β_1 through β_{12} are significantly different from zero:

$$\begin{aligned}
 PERPERF_{it} = & \beta_0 + \beta_1 AGENTCAP_{it} \\
 & + \beta_2 PRINCAP_{it} + \beta_3 RELTNSHP_{it} \\
 & + \beta_4 ENVCAP_{it} + \beta_5 ENVFLUX_{it} + \beta_6 AGE_{it} \\
 & + \beta_7 FTE_{it} + \beta_8 SQFT_{it} + \beta_9 MKTDIST_{it} \\
 & + \beta_{10} RETDIST_{it} + \beta_{11} PASTEMP_i \\
 & + \beta_{12} RESPNUM_{it} + \beta_{13} ADJSLS_{it} + \epsilon_{it} \quad (2)
 \end{aligned}$$

In the equation above, $PERPERF_{it}$ is perceived performance of agent i at year t ; $PASTEMP_i$ is a

dummy variable indicating whether agent i is a past employee of the principal; and $RESPNUM_{it}$ is the number of times agent i has filled out the survey until year t , and other variables are as defined previously.

It can also be shown that, if all of the common method variance is due to sources that stay stable over time, such as response style or scale/item format (see Horan, DiStefano, and Motl 2003), then taking the first difference of Equation 2 should remove its impact. Therefore, we can test for the existence and extent of bias due to time-variant common method factors by estimating the following regression

and examining whether the estimates of γ_1 through γ_6 are significantly different from zero:

$$\begin{aligned} \Delta PERPERF_{it} = & \gamma_0 + \gamma_1 \Delta AGENTCAP_{it} \\ & + \gamma_2 \Delta PRINCAP_{it} + \gamma_3 \Delta RELTNSHP_{it} \\ & + \gamma_4 \Delta ENVCAP_{it} + \gamma_5 \Delta ENVFLUX_{it} \\ & + \gamma_6 RESPNUM_i + \gamma_7 \Delta ADJSLS_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

In the equation above, Δ represents change in a variable from year $t-1$ to t , and all agent-specific variables in Equation 2 that don't vary over time are differenced out.

Finally, as we discuss subsequently, some sources of common method variance have an asymmetric influence on whether perceived-performance measures overestimate or underestimate performance. We can test for the existence and extent of these asymmetric sources by estimating the following binomial logit models and examining their coefficient estimates:

$$\begin{aligned} Pr(Overestimation)_{it} = & \frac{e^{V_{it}}}{1 + e^{V_{it}}} \\ \text{where } V_{it} = & \beta_{0,ov} + \beta_{1,ov} AGENTCAP_{it} \\ & + \beta_{2,ov} PRINCAP_{it} + \beta_{3,ov} RELTNSHP_{it} \\ & + \beta_{4,ov} ENVCAP_{it} + \beta_{5,ov} ENVFLUX_{it} \\ & + \beta_{6,ov} AGE_{it} + \beta_{7,ov} FTE_{it} + \beta_{8,ov} SQFT_{it} \\ & + \beta_{9,ov} MKTDIST_{it} + \beta_{10,ov} RETDIST_{it} \\ & + \beta_{11,ov} PASTEMP_i + \beta_{12,ov} RESPNUM_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

$$\begin{aligned} Pr(Underestimation)_{it} = & \frac{e^{U_{it}}}{1 + e^{U_{it}}} \\ \text{where } U_{it} = & \beta_{0,un} + \beta_{1,un} AGENTCAP_{it} \\ & + \beta_{2,un} PRINCAP_{it} + \beta_{3,un} RELTNSHP_{it} \\ & + \beta_{4,un} ENVCAP_{it} + \beta_{5,un} ENVFLUX_{it} \\ & + \beta_{6,un} AGE_{it} + \beta_{7,un} FTE_{it} + \beta_{8,un} SQFT_{it} \\ & + \beta_{9,un} MKTDIST_{it} + \beta_{10,un} RETDIST_{it} \\ & + \beta_{11,un} PASTEMP_i + \beta_{12,un} RESPNUM_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

Hypotheses development

The most frequently cited sources of common method variance are format effects and response style, which apply uniformly to all constructs measured using similar scales. However, the psychological processes of

respondents providing data on several constructs can also contribute greatly to common method variance bias. We focus on these here because their impact varies with the specific constructs that are measured.

The social psychology literature identifies three psychological processes that are relevant to agents' perceptions of their own performance, their own and others' capabilities, and environmental factors. First is the existence of positive illusions. There is substantial evidence that normal individuals possess highly skewed, positive views of themselves (Taylor and Brown 1988), while individuals who are low in self-esteem are more likely to be unbiased in their self-perceptions (Coyne and Gottlieb 1983). Second is the need for cognitive consistency, causing individuals to modify their cognitions in ways that maximize the internal consistency of their cognitive systems, and causing groups to modify their cognitions in ways that maximize the internal consistency of their interpersonal relations (Abelson et al. 1968). Third is the self-serving bias, whereby people attribute their successes to themselves but blame their failures on others or on external factors, in order to enhance or protect their self-esteem (Bradley 1978; Campbell and Sedikides 1999; Folkes 1988). When perceptions of performance and of each of the variables depicted in Figure 1 are provided by the same respondents, these three psychological processes can bias the estimated association of the variables with performance. We discuss them below.

Agents' Own Capabilities. If some agents, e.g., those with low self-esteem, do not exhibit the positive illusions that other agents do, the result would be a positive association between these agents' perceptions of their own capabilities and their perceptions of performance, outside of any real structural relationship between own capabilities and actual performance. This bias may be alleviated in an analysis of changes, if agents' self-esteem is relatively stable over time. Agents' need for cognitive consistency would also result in an artifactually

positive association between perception of own capabilities and perception of performance that would not get differenced away in an analysis of changes. This is because people expect covariation between behavior and outcome: If agents believe their capabilities are strong, they are also likely to believe their performance is strong. Because poor performance is dissonant with a positive perception of their capabilities, agents with poor performance may reduce this dissonance with an inflated cognition of their own performance.

The consequences of positivity and cognitive consistency for performance perception are symmetric. Agents with more-positive perceptions of their own capabilities are more likely to overestimate their actual performance, and agents with less-positive perceptions of their own capabilities are more likely to underestimate their actual performance. In contrast, the consequence of self-serving bias is asymmetric: If agents attribute superior performance to themselves but not inferior performance, there would be an artifactual positive association between perceptions of own capabilities and perceptions of performance when perceived performance is high, but not when perceived performance is low. As a result, overestimates of performance should be associated with more-positive perceptions of own capabilities, but underestimates of performance should not have a significant association with perceptions of own capabilities. Thus, we hypothesize:

H1a: After controlling for the influence of objective performance, agents' perception of their own capabilities will have a positive association with their perceived performance, i.e., $\beta_1 > 0$.

H1b: After controlling for changes in objective performance, changes in agents' perception of their own capabilities will have a positive association with changes in perceived performance, i.e., $\gamma_1 > 0$.

H1c: Agents' perception of their own capabilities will have a positive association with the

probability of overestimating performance, but it will not be related to the probability of underestimating performance, i.e., $\beta_{1,ov} > 0$ and $\beta_{1,un} = 0$.

Principal's Capabilities. Since individuals tend to have positive illusions about themselves, but not about others, such illusions would not create an artifactual positive relationship between agents' perceptions of principal's capabilities and their perceptions of their own performance. In fact, by biasing perceived performance upwards for some agents, positive illusions may obfuscate any real positive effect of principal's capabilities on actual performance. If agents expect the capabilities of the principal to influence their performance, cognitive consistency will lead to a positive association between perceptions of the principal's capabilities and performance, outside of any real structural relationship between the two, and this bias will not be differenced away in an analysis of changes. Finally, if individuals are more likely to attribute inferior performance to others but not superior performance, underestimates of performance should be associated with less-positive perceptions of the principal's capabilities, but overestimates of performance should not have a significant association with perceptions of the principal's capabilities. Thus, we hypothesize:

H2a: After controlling for the influence of objective performance, agents' perception of the principal's capabilities will have a positive association with their perceived performance, i.e., $\beta_2 > 0$.

H2b: After controlling for changes in objective performance, changes in agents' perception of the principal's capabilities will have a positive association with changes in their perceived performance, i.e., $\gamma_2 > 0$.

H2c: Agents' perception of the principal's capabilities will have a negative association with the probability of underestimating performance, but it will not be related to the probability of overestimating performance, i.e., $\beta_{2,ov} = 0$ and $\beta_{2,un} < 0$.

Relationship Quality. To the extent that agents expect the quality of their relationship with the principal to influence their performance, cognitive consistency should lead to a positive association between perceptions of relationship quality and performance, outside of any real structural relationship between the two. The more positively agents perceive their relationship with the principal, the more likely they should be to overestimate their performance and the less likely they should be to underestimate their performance. The impact of positivity and self-serving attributions depends upon the extent to which agents implicitly ascribe the quality of the relationship to their own efforts rather than the principal's efforts. If they ascribe it, at least to some extent, to themselves, the direction of bias should be as in the case of agent capabilities, and so should the asymmetry in the association of overestimates and underestimates of performance with perceptions of relationship quality. However, the asymmetry may not be as strong. Thus, we hypothesize:

H3a: After controlling for the influence of objective performance, agents' perception of the quality of their relationship with the principal will have a positive association with their perceived performance, i.e., $\beta_3 > 0$.

H3b: After controlling for changes in objective performance, changes in agents' perception of the quality of their relationship with the principal will have a positive association with changes in their perceived performance, i.e., $\gamma_3 > 0$.

H3c: Agents' perception of the quality of their relationship with the principal will have a positive association with the probability of overestimating performance, but it will not be related to the probability of underestimating performance, i.e., $\beta_{3,ov} > 0$ and $\beta_{3,un} = 0$.

Environment. Cognitive consistency should lead to a positive association of perceived environmental capacity and a possibly negative association of perceived environmental flux with perceived performance over and above any real

structural relationship with objective performance. Self-serving bias may also exhibit itself with environmental variables if agents attribute inferior performance to external factors but not superior performance. If so, overestimation of performance may not be associated with perceptions of greater environmental capacity and less environmental flux, but underestimation of performance may be associated with less capacity and greater flux. However, this asymmetry may be weaker than it is in attributions to one's own and the principal's capabilities. Thus, we hypothesize:

H4a: After controlling for the influence of objective performance, agents' perception of environmental capacity will have a positive association with their perceived performance, and their perception of environmental flux will have a negative association, i.e., $\beta_4 > 0$ and $\beta_5 < 0$.

H4b: After controlling for changes in objective performance, changes in agents' perception of environmental capacity will have a positive association with changes in perceived performance, and changes in their perception of environmental flux will have a negative association, i.e., $\gamma_4 > 0$ and $\gamma_5 < 0$.

H4c: Agents' perception of environmental capacity will have a positive association with the probability of overestimating performance and a negative association with the probability of underestimating performance. Their perception of environmental flux will have a negative association with the probability of overestimating performance and a positive association with the probability of underestimating performance, i.e., $\beta_{4,ov} > 0$, $\beta_{4,un} < 0$, $\beta_{5,ov} < 0$, and $\beta_{5,un} > 0$.

Demographic Factors. Because demographic variables are generally factual rather than perceptual, and they are not measured using the same Likert-type scales that perceptual measures are, the potential for bias due to common method variance is alleviated. However, certain demographic variables may be systematically associated with perceptual (in)accuracy. First, agents who have a longer association with the

Table 4
Correlations Between Performance Measures

	Sales	ADJSLS	Lagged SALES	Lagged ADJSLS
Perceived performance (<i>PERPERF</i>)	.32	.29	.24	.23
Perceived sales growth (<i>PERSG</i>)	.29	.27	.20	.20
Perceived profit growth (<i>PERPG</i>)	.28	.24	.20	.18
Perceived overall profit (<i>PEROP</i>)	.28	.23	.21	.21
Perceived labor productivity (<i>PERLP</i>)	.28	.27	.21	.21
Perceived cash flow (<i>PERCF</i>)	.27	.25	.21	.20
Lagged <i>PERPERF</i>	.26	.25	.30	.28
Lagged <i>PERSG</i>	.22	.21	.26	.24
Lagged <i>PERPG</i>	.23	.21	.27	.23
Lagged <i>PEROP</i>	.24	.22	.26	.23
Lagged <i>PERLP</i>	.25	.25	.27	.27
Lagged <i>PERCF</i>	.23	.22	.25	.24

principal or are past employees of the principal have greater experience and therefore may be more accurate in their perceptions. On the other hand, experience may make individuals more confident in their perceptions but not necessarily more accurate (Mezias and Starbuck 2003; Swann and Gill 1997). Second, perceptions may grow more accurate over time (Maule and Hodgkinson 2003), so that agents are less likely to underestimate or overestimate in later surveys than in earlier ones. Third, tracking performance may be more critical to agents who have invested more resources in the business in terms of manpower, space, etc., and in environments where competition is intense, so the perceptions of these agents may be more accurate. On the other hand, it may be more difficult to assess performance after controlling for resources employed and market conditions, so perceptions may be less accurate (Comer 1999). We do not propose *a priori* hypotheses about these demographic variables because the direction of the association cannot be predicted from prior research.

Results

We assess the validity of the perceived-performance measure and potential bias in its

relationship with channel constructs in three steps. First, we examine the correlation between the measurements of perceived performance and of objective performance. Second, we determine whether the observed association of performance with key channel-related variables is biased when one uses the perceived-performance measure instead of objective performance, and we distinguish between bias due to time-invariant factors and bias due to time-varying common-method factors. Third, we quantify the extent to which agents tend to underestimate or overestimate performance and how this underestimation or overestimation is related to their perceptions of these channel variables. Note that, in all our analyses, we standardize both the perceived-performance and objective-performance measures. This controls for any “mean shift” and makes the scales of the two measures comparable.

Correlations between perceived-performance and objective-performance measures

Table 4 contains the correlations of objective performance with the perceived-performance measure and with the individual items that constitute the perceived-performance scale. To see if agents’ perception of their own performance either leads or lags objective performance

Table 5
Bias due to all Common Method Factors

Independent Variable	Dependent Variable		
	PERPERF	PERPERF	ADJSLS
Agent capabilities	.074** (3.11)	.081** (3.28)	-.001 (-.09)
Principal capabilities	.034 (1.39)	.026 (1.02)	.007 (.56)
Relationship quality	.094** (3.83)	.084** (3.32)	.006 (.46)
Environmental flux	.016 (.68)	.024 (.95)	.016 (1.44)
Environmental capacity	.039 (1.46)	.060** (2.20)	.037** (3.01)
Distance to principal's store	.098 (1.28)	.103 (1.25)	--
Distance to market	-.079 (-1.03)	-.074 (-.90)	--
Dedicated square footage	.116** (4.27)	.088** (3.08)	--
Dedicated FTE employees	.026 (1.01)	.023 (.84)	--
Number of years as agent	.063* (1.94)	.069** (1.96)	--
Respondent past employee	.039 (.35)	.101 (.85)	-.069 (-.92)
Survey response number	.021 (.93)	.035 (1.51)	.034** (3.93)
Adjusted sales	.307** (10.88)	--	--

Note: *t*-statistics are in parentheses

** $p < .05$; * $p < .10$

(Frazier and Rody 1991), we also report the corresponding correlations with one-year lags between the measures. The table highlights several important results. First, the correlation of perceived performance with objective performance is significantly positive but far from perfect. Second, the individual items that compose the perceived-performance scale, including the item that specifically refers to sales, correlate with objective performance less strongly than does the overall perceived-

performance scale. Third, *ADJSLS* does not correlate with perceived performance more strongly than with net sales, even though the perceived-performance measure is relative. This is consistent with Comer (1999), who found that subjective salesperson performance correlates more strongly with objective measures that do not control for externalities than with measures that do. Fourth, the correlation between objective-performance and perceived-performance measurements is not strengthened when we allow for a time lag between them. It does not appear that agents' assessments either are more in tune with future trends in objective performance or lag behind it.

Since some of the items in the perceived-performance measure refer to growth, we also checked the correlations of those items with changes (i.e., growth) in objective performance. These correlations were much lower than those reported in the table. For instance, perceived sales growth has a correlation of .16 with change in net sales and .12 with change in adjusted sales. Finally, it may be argued that, from a managerial viewpoint, how well agents assess changes and trends in their performance over time is as important as, and perhaps even more important than, their ability to assess the level of their performance relative to others. Therefore, we examined the correlations between changes in perceived performance and changes in objective performance. However, these correlations are even lower than correlations among levels. Change in perceived performance has a correlation of .15 with change in net sales and .10 with change in adjusted sales.

Thus, the analysis of correlations shows a statistically significant positive association of perceived performance with objective performance, but the association is far from perfect. The correlation between changes in the two types of measures is even weaker. However, the magnitude of the correlation is just the starting point of our analysis. After all, even a stronger correlation would not be very comforting if perceived

performance contains substantial systematic error that would make its association with other variables very different from its association with objective performance. We investigate this next.

Total bias due to common method variance

To assess the extent to which observed associations of channel variables with performance are biased due to common method variance if the perceived-performance measure is used instead of objective performance, we estimate the regression model in Equation 2. To account for the longitudinal nature of the dataset, where observations from the same agent over time are not independent, we estimate a random effects model using maximum likelihood, where the error term has an agent-specific component and a random component.

Estimates of this random effects model are provided in the first column of Table 5. The table makes several interesting points. The good news is that perceived performance does have a significant and strong relationship with objective performance. The coefficient of *ADJSLS* is the strongest of all the variables in the model. The bad news, however, is that some of the channel factors have a significant association with perceived performance, holding objective performance constant. Among perceptual constructs, agents' perceptions of their own capabilities and of the quality of their relationship with the principal stand out as biasing influences, supporting H1a and H3a. However, H2a and H4a about principal capabilities and the environment are not supported. This could be because, as noted earlier, respondents with positive illusions about themselves have inflated perceptions of their performance but not of the principal's capabilities or the external factors. Among agent and market characteristics, square footage and number of years as an agent stand out as biasing influences—agents are unable to properly account for these variables in benchmarking their performance against other agents.

The direct association of these variables with perceived performance, holding objective

performance constant, means that a researcher who uses the perceived-performance measure to estimate the effect of these variables on performance would obtain biased estimates that would not hold up if objective performance were used. The last two columns of the table confirm this—variables such as agents' perceptions of their own capabilities and of the quality of their relationship with the principal show a significant association with perceived performance but not with objective performance. This puts in question the validity of observed empirical relationships between perceived performance and some variables that are measured using the same method.

Although it may appear disconcerting that channel constructs show no significant association with objective performance, this is consistent with the findings of Voss and Voss (2000) and Szymanski, Kroff, and Troy (2003), who find that perceptions of variables like product quality and innovation are strongly associated with perceived performance but not nearly as much with objective performance. It is also consistent with Frazier's (1999) argument that it may be difficult to find a significant association between objective performance and channel variables in cross-sectional analyses because unobserved firm-specific factors affect performance and dominate the channel constructs. We find some support for this argument below.

Bias due to time-varying common method factors

To assess whether any bias remains once the effect of time-invariant common method factors is removed, we estimate the regression model in Equation 3. Estimates of this model are provided in the first column of Table 6. Again, the good news is that changes in perceived performance are significantly associated with changes in objective performance. Further, the biasing influence of agent capabilities is reduced. Consistent with H3b, however, relationship quality continues to be a significant biasing influence in Equation 3 even though time-invariant common method factors are controlled for.

Table 6
Bias due to Time-Variant Common Method Factors

Independent Variable	Dependent Variable		
	Change in <i>PERPERF</i>	Change in <i>PERPERF</i>	Change in <i>ADJSLS</i>
Change in agent capabilities	.026 (.83)	.026 (.83)	.001 (.03)
Change in principal capabilities	-.009 (-.28)	-.006 (-.17)	.033 (1.01)
Change in relationship quality	.081** (2.54)	.087** (2.70)	.053* (1.66)
Change in environmental flux	-.045 (-1.41)	-.044 (-1.38)	.007 (.23)
Change in environmental capacity	-.040 (-1.22)	-.035 (-1.01)	.065* (1.99)
Survey response number	-.066** (-2.09)	-.084** (-2.71)	-.175** (-5.68)
Change in adjusted sales	.105** (3.33)	--	--

Note: *t*-statistics are in parentheses
** $p < .05$; * $p < .10$

Interestingly, relationship quality shows no association with objective performance in the last column of Table 5, but its effect is positive and statistically significant in the last column of Table 6. This supports the argument that a longitudinal analysis of changes that controls for unobserved firm-specific factors may be more suited to examining how channel variables influence objective performance (Frazier 1999; Gomez, McLaughlin, and Wittink 2004). Thus, longitudinal data hold promise in the context of channels research—not only do they allow the researcher to control for several sources of common method variance, they are also more likely to reveal any real association that might exist between channel variables and performance. Of course, the advantage of analyzing changes in variables over time must be weighed against the loss in efficiency that is likely to occur when there is not enough variation in the independent variables over time (Christen and Gatignon 2003).

Overestimation versus underestimation of performance

As discussed previously, some biases operate asymmetrically for overestimation versus underestimation of performance. We now examine the extent to which respondents overestimate or underestimate their performance relative to other agents and whether the association of channel variables with this overestimation or underestimation is consistent with our hypotheses.

Standardized <i>PERPERF</i> Minus Standardized <i>ADJSLS</i>	% of Sample
Less than -1.0	17%
Between -1.0 and -.5	11%
Between -.5 and -.25	8%
Between -.25 and +.25	18%
Between +.25 and +.5	10%
Between +.5 and +1.0	18%
Greater than +1.0	18%

The table above summarizes the distribution of the difference between standardized perceived performance and standardized objective performance for our sample. It shows that about 18% of the sample is very accurate in estimating performance relative to other agents, with a difference of less than .25 between the two standardized measures. 36% of the sample substantially overestimates performance (difference greater than +.5), while 28% substantially underestimate performance (difference less than -.5). Since we have multiple observations per agent in our sample, we also wanted to see whether individual agents consistently overestimate or underestimate their performance or whether they oscillate from one to the other during the years of the survey. Interestingly, we find that, of the agents who respond more than twice, 49% substantially overestimate their performance relative to other agents every time, and 31% substantially underestimate it every time.

To test the hypotheses we developed about the association of channel variables with overesti-

Table 7
Correlates of Overestimation and Underestimation of Relative Performance

Independent Variable	Dependent Variable	
	Probability of Overestimation	Probability of Underestimation
Agent capabilities	.190** (2.69)	.001 (.01)
Principal capabilities	.044 (.61)	-.146* (-1.87)
Relationship quality	.345** (4.71)	-.101 (-1.31)
Environmental change	-.001 (-.02)	-.054 (-.71)
Environmental capacity	.274** (3.53)	.193** (2.34)
Distance to principal's store	-.095 (-.45)	-.165 (-.67)
Distance to market	.402* (1.87)	.353 (1.43)
Dedicated square footage	.198** (2.21)	.080 (.76)
Dedicated FTE employees	.138* (1.83)	.139 (1.34)
Number of years as agent	-.025 (-.27)	-.157 (-1.55)
Respondent past employee	.339 (1.04)	.143 (.40)
Survey response number	.097 (1.47)	.114 (1.60)

Note: *t*-statistics are in parentheses

** $p < .05$; * $p < .10$

mation versus underestimation, we first divide the sample into three groups. Group 1 consists of “underestimates,” for whom the difference between the standardized values of perceived performance and objective performance is less than $-.5$. Group 2 consists of “accurates,” for whom the difference is between $-.5$ and $+.5$, and Group 3 consists of “overestimates,” for whom the difference is greater than $+.5$. Then, we estimate the binomial logit models in equations 4 and 5. Equation 4 compares groups 1

and 2 to examine the correlates of underestimation, and Equation 5 compares groups 2 and 3 to examine the correlates of overestimation. Table 7 provides random effects maximum likelihood estimates of the two models.

The table highlights several interesting findings. First, the estimated coefficients of agents' own capabilities and principal's capabilities in the two models are consistent with H1c and H2c and point to the existence of some self-serving attribution bias. More-positive perceptions of own capabilities are significantly related to overestimation, but more-negative perceptions are not significantly related to underestimation. In contrast, positive perceptions of the principal's capabilities are not at all related to overestimation, but negative perceptions of the principal's capabilities show a statistically significant association with underestimation. It does appear that agents are more likely to attribute perceived success to themselves and perceived failure to the principal. It is important to note that these asymmetric self-serving biases exhibit themselves despite the more symmetric forces of other sources of common method variance.

Second, there is asymmetry in the coefficient of relationship quality too. Consistent with our hypothesis in H3c, there is a positive association of this variable with overestimation of performance and a statistically insignificant association with underestimation. As we expected, though, the asymmetry is less strong than for agent capabilities. The coefficient of relationship quality in the model predicting underestimation is not statistically significant, but it is negative and much stronger than the coefficient of agent capabilities.

Third, the estimated coefficients of perceptions of the environment are not consistent with attribution asymmetry. Perception of flux in the environment does not have a significant relationship with perceptual accuracy. As we hypothesized in H4c, perception of high environmental capacity is positively associated with

overestimation of performance. Surprisingly, it is also positively associated with underestimation of performance.

Fourth, the association of various demographic factors with accuracy of perceived performance is mixed but interesting. Experience with the principal does not seem to make agents significantly more accurate. The number of years an agent has been affiliated with the principal makes underestimation of performance somewhat less likely, and it does not matter at all if the agent is a past employee of the principal. This is consistent with Meziar and Starbuck (2003). It is also interesting that increased resource investment on the part of the agent worsens perceptual accuracy. Agents who have more employees or dedicate a lot of square footage to the principal's business are more likely to overestimate their performance relative to other agents. This may reflect their desire for cognitive consistency—they expect to do better than other agents because they have invested more—but it is interesting that agents who dedicate less square footage and FTE employees to the business do not tend to underestimate their performance. In fact, directionally, the estimated coefficients suggest that some agents with high resource investment overestimate their performance while others underestimate it. It appears that they are unable to accurately calibrate their high resource investment and corresponding performance vis-à-vis other agents. Finally, repeated experience with survey completion does not seem to improve accuracy.

Conclusion

Summary of findings

We have examined the validity of observed relationships between performance and the variables that might influence performance, when perceptual measures of performance and these other variables are obtained using the same method and from the same respondents. Our analysis is done in the context of a principal and its independent agents. Along with agents'

perceived performance, we obtained measures of other variables whose relationship with performance is typically studied in channels research. We developed and tested hypotheses about how the relationship of each of these variables with perceived performance may be biased and how they may be associated with systematic underestimation versus overestimation of objective performance. We were able to do this analysis because we obtained both subjective and objective performance measures. To exclude the possibility that any lack of correspondence between the two types of measures may be because of differences in the fundamental dimensions they tap, the perceptual measure in our work was designed to tap into the same dimension that objective performance assesses. Further, we obtained longitudinal data from the same respondents using the same survey instrument over five years. This allowed us to separate biases due to instrument format and response style from biases due to the psychological processes of respondents.

Our main findings are as follows. First, there are significant differences in the observed association of various variables with perceived performance versus with objective performance. In particular, agents' perceptions of variables such as their own capabilities and agents' perceptions of their relationship with the principal are significantly positively associated with perceived performance but not with objective performance. Second, some, though not all, of these differences persist after we control for time-invariant sources of bias. Third, these differences are consistent with the predictions of psychological processes like positive illusions and cognitive consistency. Fourth, there is an asymmetric association of agents' perceptions of variables such as their own capabilities, their relationship with the principal, and the principal's capabilities with the probability that agents will overestimate versus underestimate their performance. This asymmetric association is consistent with the predictions of self-serving bias in individuals. Fifth, agents do not appear to be able to correctly incorporate their percep-

tion of market potential into their perception of their relative performance. They are more likely to be accurate when they perceive the environment as being less munificent, but the likelihood of both underestimation and overestimation increases with perceptions of high environmental capacity. Sixth, agents are not able to calibrate their performance relative to others and relative to the resources they invest in the business. Their years of experience in the business do not make them more accurate, and their investment in employees and space makes them more likely to overestimate their relative performance.

Implications for researchers

The implications of these findings for researchers are important. First and foremost, they demonstrate the pitfalls of obtaining perceptual data on both performance and its potential antecedents from the same respondents, especially when the nature of the variables being measured is such that respondents' psychological need for consistency, ego enhancement, or ego protection is likely to be aroused. In the channel context, for instance, one can see that the problem is serious because the agent expects and attributes a relationship between his performance and his own and the principal's capabilities, and his responses will likely reflect that psychological process. In contrast, if each respondent is providing information on either performance or its potential antecedents, but not both, the problem is mitigated. There may be inaccuracies, but these do not bias the relationship between antecedents and performance. Perhaps that is why, even though the correlation of a supervisor's subjective ratings of an employee's performance with objective performance measures is far from perfect, researchers do not find significant differences in the estimated relationship of these performance measures with other variables measured separately, such as age (McEvoy and Cascio 1989), integrity tests (Ones, Viswesvaran, and Schmidt 1993), and personality (Tett, Jackson, and Rothstein 1991). Thus, researchers should make an effort to separate

their measures of performance from their measures of its antecedents, either by using different respondents within the organization to provide information on each, or by using multiple methods to gauge performance. Clearly, using multiple respondents to provide data on both performance and antecedents and averaging their responses doesn't solve the problem.

Second, unlike what one might conclude from general treatments of common method bias, the impact of different common method factors varies substantially across different variables both in magnitude and in direction. It is not just that all correlations are inflated. Importantly, theory allows us to predict these differences *a priori* for several marketing variables.

Third, our work shows that commonly used procedures for assessing the quality of perceptual measures may not reveal the problem. Clearly, reliability is not an issue. Perceptions of respondents can be very reliable and yet biased. In fact, even in our analysis, the reliability of perceived performance and the other variables is very strong. Convergent validity is an important issue, but convergent validity of perceived performance is often evaluated by correlating it with perceptual measures of other constructs that should covary with performance. However, as we have seen here, these correlations may reflect common method variance and not convergent validity. Convergent validity should be assessed by examining a construct's correlation with other constructs whose measures have been obtained by different methods (Campbell and Fiske 1959) or at least from different respondents.

Fourth, researchers should keep in mind the specific objective performance measures against which they intend to validate their subjective measures before they design their surveys and collect data. They should ensure that at least some of the subjective measures in their survey do tap into the same dimension(s) as the objective measure. A lack of convergence between subjective and objective performance measures

may indeed be because subjective measures can be designed to assess multiple facets of performance that objective measures do not, but that argument would be more credible if the specific subjective performance items that are designed to tap into the same dimension(s) as objective performance do converge with the latter.

Fifth, our work reinforces the benefits of obtaining longitudinal data whenever possible. Not only can the researcher control for some sources of common method variance by examining changes over time, the true impact of variables like relationship quality may stand a better chance of being revealed when more dominant firm-specific drivers of performance are differenced away.

A sixth implication of our research is that respondents may not be able to correctly assess their own performance relative to others. Since our objective in this paper was to assess the validity of subjective performance measures commonly used in the literature, we worded the scale in relative terms, in accordance with standard practice. The exact items in the scale are taken from Lusch and Brown (1996), but others too have argued for the use of relative perceived-performance measures (e.g., Doney and Cannon 1997; Kohli, Shervani, and Challagalla 1998; Sujan, Weitz, and Kumar 1994). The main reason is to account for differences in performance levels between respondents due to business/industry differences and market externalities. Perhaps one way to retain the advantage of the relative measure while improving the quality of the data obtained from respondents is to tell them explicitly whom they should benchmark against when they assess their relative performance, e.g., the three largest competitors in their served market.

We should note, however, that the lack of correspondence we find between perceived performance and objective performance cannot be attributed to the fact that the perceived-performance measure is relative. Our objective measure is relative as well so that there is no

“mismatch” between the two, although we do recognize that this relative objective measure is estimated using a regression, and, as such, it may have some random error. Importantly, the systematic difference in the pattern of association that we observe between channel variables and perceived performance on the one hand and objective performance on the other hand cannot be explained by random inaccuracy in agents’ benchmarking of their performance versus others, or by random error in the estimation of objective performance relative to others. In other words, there is no reason why agents’ capabilities and relationship quality should show a significantly positive relationship with perceived performance but not with objective performance, either because agents made random errors in assessing their relative performance or because our estimation of objective relative performance had some error. Nor do such errors explain why we would observe the specific asymmetric associations of variables like agents’ own capabilities and principal’s capabilities with underestimation and overestimation of performance. Finally, we repeated our analysis using two other objective measures—net sales and relative net sales—and found that most of our substantive findings remained unchanged.

Discussion

Perceptual-performance measures are used extensively by managers and in academic research, and the question of their validity is quite a sensitive one. There are strong arguments in favor of their use, particularly in certain circumstances. For instance, subjective ratings of performance may encompass important dimensions that may not be reflected in commonly used objective measures of performance (Anderson 1990; Jaworski and Kohli 1993). Kumar, Stern, and Achrol (1992) identify eight facets of reseller performance and use them to develop perceived-performance measures. It would be difficult for any single measure to encompass all of these facets. Also, objective measures like profit or rates of return may suffer from the vagaries of accounting methods, as

recent events in the corporate world have shown, and they simply cannot be used in many instances, because managers are not willing to share them or because they are difficult to compare, e.g., in international contexts. Another issue is that, at least for some constructs, perception is indeed reality. For instance, no matter what any “objective” criteria might say, whether a customer trusts a supplier or not is ultimately a matter of the customer’s perception.

Given these advantages and the rich insights that perceptual-performance measures can provide, it does not make sense to conclude that they should not be used. Certainly, that is not a conclusion that should be drawn from our research. Rather, the lesson from our work is that researchers need to focus on trying to (1) minimize sources of common method variance that may bias the estimated relationship of performance with other variables of interest to the researcher; and (2) improve the accuracy of subjective or self-report measures. We have shown that the former problem is significant, that it differs across variables, and that the differences can be predicted *a priori*. We also suggest ways to alleviate the problem.

Prior research provides several suggestions for the latter problem (e.g., Podsakoff et al. 2003). One exemplar for this is the Profit Impact of Marketing Strategy (PIMS) project and database. Although PIMS generated a large body of marketing strategy research and substantial debate, its hallmark was the ability to obtain, on a large scale, measures of own and competitive strategy, environment, and performance through a well-designed survey (Buzzell and Gale 1987). For instance, managers were asked to report not just their market share, but also their market share relative to their biggest competitors, their dollar sales disguised by a multiplicative factor, the number of their customers, their purchase frequency, and their purchase amounts (Farris 2004). Each of these questions appeared in different formats, required the responding managers to think carefully and access different types of data

before responding, and allowed the researcher to test for convergent validity. Several researchers have subsequently used the PIMS scales in their research, and validation attempts have been relatively successful (Farley 2004). Another exemplar for improving accuracy of subjective measures is the multiple-respondent approach of Kumar, Stern, and Anderson (1993), which assesses respondent competency and uses a consensus approach to resolve discrepancies in informant reports.

In conclusion, we recognize that our analysis is limited to one dataset in one research context. However, the measures we use and the constructs we examine are very typical in the channels literature. Further, it is important to conduct such analyses in a specific research context because the validity of the perceived-performance measure is influenced by the context, specifically, by which other variables are being studied and how they are being measured. We believe that our work makes a contribution to the literature by going beyond a recognition of the general existence of common method variance to an understanding of the specific sources of such variance in the relationship between individual marketing variables and performance. We also hope that it moves the discussion forward from trying to justify the universal superiority of either subjective or objective measures to identifying situations where the validity of relationships of interest to the researcher may be influenced by the types of measures used, predicting how these influences might vary across specific relationships, and finding ways to alleviate these influences. Finally, we hope it will encourage such analyses in other important marketing contexts, such as in the study of market orientation and innovativeness. For instance, are the differences in relationships of innovativeness and product quality with perceived versus objective performance found by Voss and Voss (2000) and Szymanski, Kroff, and Troy (2003) attributable to common method variance, and, if so, which particular sources of common method variance are at play? The type of analysis we have done in

this paper can answer these questions and provide guidance to future researchers, who can design research methods to alleviate the impact of those specific sources. On the other hand, there may well be situations where biases in observed relationships between variables are much less serious (Spector 1987) or are largely driven by time-invariant common method factors that are somewhat easier to control, and these, too, should be identified. ■

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Appendix. List of Survey Items ¹

I. Agent Capabilities

Customer Orientation (Kumar, Stern, and Achrol 1992)

It is very important for our *xxx* business that we ...
go out of our way to satisfy *xxx*'s customers.
solve customers' problems involving *xxx*'s products and services.
willingly accept returns of *xxx* products from our customers.

Adaptation (Kumar, Stern, and Achrol 1992)

It is very important for our *xxx* business that we ...
change our selling tactics for *xxx*'s products to match the market trends.
find creative ways to market *xxx*'s products and services.
be responsive to seasonal sales fluctuations (e.g., by changing hours of operations, staff, local advertising).

Service Quality (Dabholkar, Johnston, and Cathey 1994)

Our store performs the service right the first time.
Our customers feel safe in their transactions with us.
Our employees are consistently courteous to our customers.
When a customer has a problem, we show a sincere interest in solving it.

Competence (Kumar, Stern, and Achrol 1992)

We have detailed knowledge of *xxx*'s product lines, which makes us an effective *xxx* agent.
We understand *xxx*'s business procedures and can help customers that require special assistance in dealing with *xxx*.
We have invested considerable time and money in educating and training our employees to be more competent in selling *xxx* products.

Compliance (Kumar, Stern, and Achrol 1992)

We willingly agree to participate in *xxx*'s marketing programs when asked.

We usually conform to *xxx*'s accepted procedures for handling merchandise.

We report all required information on our market and business accurately and on time.

II. Principal Capabilities

Service Quality (Parasuraman, Zeithaml, and Berry 1986)

xxx's employees are knowledgeable and courteous to their customers.
xxx treats its customers with considerate individualized attention.
xxx's employees inspire trust and confidence in their customers.

Operational Support

xxx's management usually responds promptly to my needs and problems.
Assistance from *xxx* for keeping operations running smoothly is readily available.
xxx provides me with substantial computer and/or phone support.
xxx's ASMs are always available to help us solve any day-to-day operational problems.

Product Quality

xxx's soft goods lines represent superior value for our customers.
xxx's soft goods lines have enough variety and assortment.
xxx's big-ticket items provide a rich assortment to the customers.
xxx's big ticket goods represent superior value for our customers.
I can count on *xxx* to acquire quality goods from the best suppliers.
xxx's suppliers usually provide quality soft goods at attractive prices.
xxx's big-ticket items offer the right quality at the right price.

Trustworthiness (Crosby, Evans, and Cowles 1990)
I can count on *xxx* to be honest in their dealings with me.
xxx is a company that stands by its word.
I can rely on *xxx* to keep the promises they make to me.
xxx is sincere in its dealings with me.
xxx can be counted on to do what is right.
xxx is a company that I have great confidence in.

III. Relationship Quality

Flexibility (Kaufmann and Dant 1992)
We would willingly make adjustments to help out *xxx* when faced with special problems or circumstances.
We would gladly set aside the contractual terms in order to work through difficult situations with *xxx*.
xxx willingly makes adjustments to help us out when we are faced with special problems or circumstances.
xxx gladly sets aside the contractual terms in order to work with us in difficult times.

Mutuality (Kaufmann and Dant 1992)
Even if costs and benefits are not evenly shared between us in a given time period, they balance out over time.
We each benefit and earn in proportion to the efforts we put in.
My business usually gets a fair share of the rewards and cost-savings in doing business with *xxx*
In our relationship, none of us benefits more than one deserves.

Conflict Norms (Smith and Barclay 1995)
In our relationship with *xxx* ...
differences of opinion are encouraged and seen as beneficial.
what conflict there is in our relationship tends to be beneficial in the long run.
conflict is not seen as harmful by itself, as it does not prevent us from getting the work done.
the way disputes are handled eventually brings us closer together.

Distributive Justice (Kumar, Scheer, and Steenkamp 1995)
Our earnings from *xxx* catalogue agency business are fair given ...
the duties and responsibilities that I perform for *xxx*.
what other *xxx* agents earn in markets similar to mine.
what *xxx* earns from its sales through my catalogue store.
the contributions I make towards *xxx*'s marketing effort in my market.

Cooperation (Dant 1986)
We have a mutually beneficial relationship.
We can work together well in this business.
We can count on *xxx* to be a team player.
We have a fair and equitable relationship.
We look after each other's interest in this relationship.
We should describe our relationship as cooperative.
Neither party makes demands that might harm the other.

IV. Environment

Environmental Capacity (Achrol and Stern 1988)
For *xxx* catalog business in our local sales territory ...
the potential for growth in sales is high.
the demand for *xxx* products or brands is high.
the potential for growth in total employment is high.
the potential for growth in retail establishments is high.
the general consumer purchasing levels are up.

Environmental Diversity (Achrol and Stern 1988)
Our customers are very diverse in terms of their ...
incomes, professions, social class, and education.
preferences for the variety of products they want to purchase.
product price/quality preferences.
credit needs.
service needs (e.g., sales assistance/advice, product servicing/installation).

Environmental Dynamism (Achrol and Stern 1988)
Major changes have occurred in our local *xxx* catalog business in terms of ...
competitors' mix of products/brands.
competitors' sales strategies.
customer tastes/preferences in product features.
customer tastes/preferences in brands.

V. Agent Performance

Perceived Performance (Lusch and Brown 1996)
As compared to other similar *xxx* agents, our performance is very high in terms of ...
sales growth.
profit growth.
overall profitability.
labor productivity.
cash flow.

VI. Demographic Variables

Distance to Principal's Store
The nearest *xxx* retail store is approximately _____ miles away from my agency.

Distance to Market
The nearest set of shops (or *market*) is approximately _____ miles away from my agency.

Dedicated Square Footage
My retail store has a shop floor area of about _____ sq. ft., of which about _____ sq. ft. are dedicated to *xxx*.

Dedicated FTE Employees²
Not counting myself, I usually have _____ full-time employees at this store, of which _____ assist with *xxx* business. Also, I usually have _____ part-time employees at this store, of which _____ assist with *xxx* business.

Number of Years as Agent

I have been a xxx merchant agent since the year 19 _____.

Past Employee

I was once a xxx employee: Yes No

Appendix Notes

1. Literature sources from which the scales are adapted are listed in parentheses wherever applicable.
2. Computed as number of full-time employees assisting with xxx business plus 50% of number of part-time employees assisting with xxx business.

Notes

1. We use the terms “perceptual” and “subjective” interchangeably to describe self-reported perceptual measures

of performance.

2. The table reports results for the survey year 2000. Results are similar for the remaining four years.

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