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The *JMI* in Brief

Articles

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The *JMI* in Brief

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ARTICLES

The relationship between firm-level organizational slack and corporate lobbying is unclear. In this paper, a series of hypotheses concerning organizational slack and subsequent lobbying at the firm level are tested. Using a panel dataset with a sample of S&P 500 firms, the relationships between (i) available slack and (ii) potential slack and corporate lobbying in the United States are measured. Findings show that available slack is related to corporate lobbying and how intensely firms attempt to sway public policy.

Keywords: Lobbying, Slack, Available Slack, Potential Slack, Corporate Political Activities

This study focuses on the relationship between board effectiveness and management compensation reporting. Specifically, the effect of overlapping memberships in audit and compensation committees (OMAC) on the readability of management compensation reports (MCR) is analyzed. Using archival data from firms listed on the German HDAX between 2014 and 2018 (329 firm-year observations) and the Flesch Reading Ease index, regression analysis shows a positive significant effect of OMAC on MCR. Similar statistical results are found in a robustness check, which refers to an alternative readability score (the Gunning Fog index). Several corporate governance and firm characteristics are included as control variables, and fixed-effects panel regressions are used. This study provides empirical support for the agency-theoretical assumption that board effectiveness and knowledge spillovers decrease conflicts of interest and information asymmetry between boards of directors and shareholders.

Keywords: audit committee, compensation committee, management compensation reporting, overlapping membership, corporate governance

The *JMI* in Brief

This study examines the influential role that organizational cynicism plays in understanding the relationship between ethical leadership and deviant work behavior. Scant research has addressed leadership or personality traits in determining organizational cynicism and its relationship to important outcomes such as deviant work behavior. An interactive effect of ethical leadership and conscientiousness is examined to determine if conscientious individuals are more or less prone to become organizational cynics based on the presence or absence of ethical leadership. The results suggest that conscientious individuals are less likely to rely on ethical leadership to prevent organizational cynicism and subsequent deviant behaviors. Conversely, individuals with lower levels of conscientiousness are more sensitive to ethical leadership and are more likely to respond as cynics, and with subsequent deviant behaviors. That is, individuals with higher levels of conscientiousness do not need ethical role models to prevent cynicism and deviant behaviors nearly as much as those who have lower levels of conscientiousness. The results provide important insights into how, and when, ethical leadership affects deviant workplace behavior.

Keywords: Organizational Cynicism, Ethical Leadership, Workplace Deviance

Although loss aversion has been shown to be a pervasive phenomenon in economics, business, and management, measuring individual loss aversion tendency has proven challenging because it requires complex and lengthy experiments and data collections. To address this, this study develops a seven-item loss aversion scale, which is simple and unidimensional. The study validates the scale by correlating it with two other decision-making tendency scales – risk aversion and risk propensity, and tests the predictive validity through two behavioral tendency statements (i.e., the sunk cost fallacy and the endowment effect) and four lottery games. The overall results suggest that the scale is a reliable and valid instrument that can be used to assess an individual's loss aversion tendency in place of more complex behavioral experiments. The paper discusses the managerial implications of the scale in various business areas and suggests future research directions for further validating the scale.

Keywords: Loss Aversion, Scale Development, Survey

The *JMI* in Brief

  Saurabh Srivastava and Derrick D'Souza

Strategic thinking is an important construct in management research, and the ability to measure it is necessary for empirical research in the area to thrive. The objective of this study is to develop, test, and validate an instrument that scholars can use to measure strategic thinking in an organizational context. A survey methodology is employed to develop the instrument, and to test its reliability and validity. The resulting fourteen-item scale displays robust convergent, discriminant, and nomological validity. The development of the instrument offers avenues for empirical research in multiple areas of management where the strategic thinking construct may be applied, including strategic management, organizational theory/design/change, organizational behavior, and human resource development, among others.

Keywords: Strategic thinking, measurement instrument, scale development

The Impact of Organizational Slack on Lobbying Activities

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Abstract: The relationship between firm-level organizational slack and corporate lobbying is unclear. In this paper, a series of hypotheses concerning organizational slack and subsequent lobbying at the firm level are tested. Using a panel dataset with a sample of S&P 500 firms, the relationships between (i) available slack and (ii) potential slack and corporate lobbying in the United States are measured. Findings show that available slack is related to corporate lobbying and how intensely firms attempt to sway public policy.
Keywords: lobbying, slack, available slack, potential slack, corporate political activities

According to management research, top management teams (TMTs) frequently realign their tangible and intangible assets to create a portfolio that leads to competitive advantage (Wefald *et al.,* 2010). Resources can be allocated to a range of market activities such as production, logistics, and marketing. Alternatively, managers can allocate resources to non-market strategies including social or political efforts (Bach and Allen, 2010; Romero, 2019). Such strategies, particularly those related to corporate political activities (CPA), which include corporate lobbying, political connectedness, and political donations are viewed with skepticism by the public. According to the Center for American Progress, surveys suggest that over eighty percent of Americans think that corporate political spending primarily benefits corporations and the wealthy. The Center for Responsive Politics continually echoes this sentiment as it reports on campaign finance law, bailout recipients, and congressional insider trading.

Organizational theorists also have an interest in such topics as they seek to complement the extant literature on market activities. Researchers have shown that corporate lobbying is linked to lower corporate tax rates (Richter *et al.*, 2009), higher return on assets (ROA) (Bonardi *et al.*, 2006: Brown, 2016a), and stock market performance (Chen *et al.*, 2014) amongst other outcomes.

Given these findings, as well as the perception that CPA investment is "an effective means of impacting policy makers in Washington D.C." (Hadani, 2012: 944), one would assume the preponderance of firms would invest in CPA. However, this is not always the case as scholars have identified specific underlying firm-level characteristics or resource stocks associated with lobbying activities such as firm size (Lux *et al.*, 2011), ownership structure (Hadani, 2012), and managerial entrenchment (Mathur *et al.*, 2013).

The process for allocating finite firm resources to a mix of market-based and non-market-based projects is complex. As part of the project selection process, managers must consider the level of investment, variance (i.e., risk), and expected cash flows (i.e., return). TMTs must also consider resource availability, which is linked with a firm's level of organizational slack. Recent work suggests that the level of organizational slack is correlated with R&D investment and experimentation (Nohria and Gulati, 1996), commitment to sustainability programs (Boso *et al.*, 2017) and entry mode selection, which includes the study of exporting (Lin *et al.*, 2009), alliances (Bizzi, 2017), and mergers and acquisitions (Uhlenbruck *et al.*, 2017). The common thread in these studies is the assumption that slack alters the behavior of risk-averse managers, in that it encourages the continuing support of projects despite the inherent risks and uncertainty that accompanies such initiatives (Bromiley, 1991; Shaikh *et al.*, 2018). In short, more ample resources act as a buffer when funds are allocated to more speculative, time-variant projects (Latham and Braun, 2008; Levinthal and March, 1981; Malen and Vaaler, 2017).

Surprisingly, few if any, studies have examined the direct link between slack resources and corporate political activities. This is unexpected because investment in CPA exhibits many of the same project characteristics noted above, specifically, considerable risk and payoffs, which are uncertain in both time and magnitude (Hersch *et al.*, 2008). This gap is addressed by examining the distinct impact of available and potential slack (Bourgeois and Singh, 1983) on lobbying, a core CPA variable. This paper will attempt to answer the following research questions, which have not been adequately addressed to date. Does slack, in general, influence lobbying expenditures? If so, is there a specific form of slack (i.e., available or potential) that influences firm spending on lobbying? The examination of these questions helps to add to the knowledge stock of the antecedents of CPA and refines the understanding of organizational slack and its linkage with other organizational variables.

This study makes two contributions to the existing literature. First, it contributes to the CPA literature. More specifically, this study examines how various forms of organizational slack are potential determinants of lobbying expenditures. As noted previously, recent research has begun to isolate the antecedents of CPA. While this research has laid a foundation for understanding why certain firms engage in lobbying, there are still many unanswered questions concerning antecedents. Slack variables are incorporated to contribute in this vein.

The second contribution is to the organizational slack literature. This contribution stems from the refinement of the understanding of various forms of slack, which have

their own distinct effects (Paeleman *et al.*, 2017). Each form of slack differs in its ease of use and potential deployability. This study contributes to the slack literature because two forms of slack, namely, available slack (liquid slack like cash), and potential slack (resources outside the organization but potentially available through raising cash through equity or debt issuance) were examined in this new context (i.e., lobbying).

The rest of the paper is organized as follows. The first portion of the paper contains a literature review as well as theory and hypothesis development. Next, there is a discussion of the methods employed, estimation techniques, and variable descriptions. Finally, the results are presented along with a discussion segment, which includes study limitations, future research potential, and managerial implications.

THEORETICAL BACKGROUND

Determinants of Lobbying Activities

Studies examining the determinants of lobbying activities fall into two broad categories: industry-level determinants and firm-level determinants. Research investigating industry-level determinants focuses on a host of factors including reliance on the government as a key supplier or key buyer (Agrawal and Knoeber, 2001; Hart, 2001), industry concentration (Drope and Hansen 2008, 2009), or the level of regulation (Vining *et al.*, 2005; Kim, 2008; Al-Ubaydli and McLaughlin, 2015).

Firm-level determinants, the focus of this paper, incorporate a wide range of firm characteristics. The most notable antecedent in the literature is firm size, captured by either revenues or number of employees (Lux *et al.,* 2011), which tends to have a positive relationship with CPA levels.[1] Similarly, firm age has been included in multiple papers and has been found to be positively related or statistically insignificant with regard to CPA (Brown, 2016a; Rudy and Johnson, 2016a). Additionally, firms' ownership structure has also been included in several papers. Ownership structure alludes to the level of institutional ownership and/or investors' portfolio concentration (Hadani, 2012; Mathur *et al.,* 2013) and the findings have supported the notion that firms with more constraints, such as blockholders, are deterred from investing in increasing CPA.

Some more idiosyncratic antecedents that have been studied include the degree of international diversification by Lu and Beamish (2004), which found that more diversified firms have a higher tendency to lobby. Evidence has also been found in both qualitative (Bucheli and Salvaj, 2018) and quantitative (Kline and Brown, 2019) studies that a firm's liability of foreignness increases its propensity to engage in CPA in host countries. Shaffer and Hillman (2000) argued that the level of corporate structure centralization was an important determinant of political activity and found evidence of such in a qualitative case study. Finally, the characteristics of the CEO and/or top management team have been the focus of several studies that have found that older CEOs lead firms that partake in increasing CPA. Furthermore, older CEOs are more prone to transactional, and less prone to relational, lobbying efforts at the firms they lead (Hillman and Hitt, 1999; Rudy and Johnson, 2016b).

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[1] There are too many papers to list for firm size as it is included as a control or explanatory variable in the vast majority of firm-level CPA papers. The paper cited is a meta-analysis and includes numerous references to firm size in CPA research.

Behavioral Theory of the Firm and Organizational Slack

Cyert and March defined organizational slack as "the difference between total resources and total necessary payments" (1963: 42). This paper relied heavily on the work of Bourgeois (1981), which refined the classification of slack into three dimensions: available, recoverable (also referred to as unavailable), and potential slack (Bourgeois and Singh, 1983). Available and recoverable slacks are considered internal forms of slack (Singh, 1986), which reflect resources that are accessible within the firm. Available or unabsorbed slack, the most liquid form of internal slack, captures slack in the form of cash and cash equivalents (i.e., short-term, highly liquid securities with less than a three-month maturity), and provides managers with the most discretion as it can easily be allocated to new projects (Singh, 1986).

Recoverable slack is less liquid than available slack as it supports firm operations in some way. For example, non-cash working capital (i.e., raw materials, work-in-process, and finished inventory), surplus machinery (Austin *et al.,* 1996) or human capital (i.e., employees), are integrated into firm operations (Greve, 2003; Malen and Vaaler, 2017; Singh, 1986) and therefore require effort to extract and reallocate. In addition to the effort to reallocate recoverable slack, it is also important to note that converting absorbed slack to liquid cash will incorporate various costs. For assets such as non-cash working capital and surplus machinery, discounts reflect transaction costs, and obsolescence, while human capital reallocation requires relocation costs, severance pay, and/or retraining expenses.

The third form of slack is potential slack, which reflects the resources that are available outside of the firm. Depending on market conditions, firms have the ability to issue new equity (i.e., common or preferred equity shares) to fund new capital projects. Alternatively, firms can raise cash by issuing firm bonds or by borrowing from other creditors through shorter-term lines of credit. However, these resources, which come in the form of firm debt or cash raised by issuing firm equity, are more cumbersome to access due to capital market inefficiencies (Bromiley, 1991; Jensen, 1993).

Organizational slack has clear benefits. Since organizational slack constitutes resources over and above those required to produce a firm's products or services (Nohria and Gulati, 1996), slack gives managers flexibility in making strategic decisions. The behavioral perspective suggests that excess resources help managers to stabilize and adapt to changing market conditions, as well as to drive value creation (Vanacker *et al.,* 2017). In general, managers allocate slack resources to manage internal threats such as workforce attrition or sub-unit conflict, or to buffer the firm from some external force. This paper mainly focuses on the usage of slack to protect the firm from outside influences, which range from new products or services offered by competitors to the changing regulatory or macroeconomic environment.

The benefits of slack are illustrated by the recent research examining the linkage between organizational slack and firm innovation and sustainability initiatives. In a study of slack and explorative activities, Bruneel *et al.* (2016) draw on the fundamental assumptions from the behavioral perspective. Consistent with this perspective, they assert that slack provides management with the freedom to invest in projects with uncertain payoffs (Greve, 2007). They found that abundant resources (i.e., slack) were associated with explorative search efforts, which are considered to be of higher risk and aligned with experimentation as opposed to exploitation. Consistent with this theme, a host of scholars have noted linkages between slack and R&D spending and innovation

initiatives (Greve, 2003; Greve, 2007; Malen and Vaaler, 2017). Scholars have also studied the relationship between slack and sustainability efforts. While investment in sustainability is plagued by high risk and uncertainty (Boso *et al.,* 2017), they also incorporate additional risk factors due to their non-market nature. For example, sustainability projects often exhibit characteristics that diverge from typical projects with direct commercial viability (Bruneel *et al.,* 2016), due to the lack of formal performance measures and accounting systems (Voss *et al.,* 2008), and established operational routines (Greve, 2007). Accordingly, behavioral theorists posit that there is a direct relationship between slack and non-market project selection. More specifically, it is argued that the availability of slack provides firms with strategic flexibility, which buffers stakeholders from sub-optimal managerial decisions (Bourgeois, 1981; Cyert and March, 1963; Fadol *et al.,* 2015). In contrast, firms without available slack will likely have a more constrained universe of investment projects.

However, there are also costs associated with available and recoverable slack. The costs from these forms of slack stem from the fact that excess assets (i.e., cash, marketable securities, inventory, long-lived assets, employees, etc.) generally do not generate a rate of return that shareholders desire (Jensen, 1989). For example, while excess cash provides flexibility, it is not an asset that generates high rates of return. Excess cash is generally swept into short-term money market funds that pay low interest rates. Since shareholders can easily diversify firm-specific risk, theoretically, they should prefer firms that are allocating resources to assets and projects with more return upside and more aggressive risk postures. Firms with less excess resources will likely have better measures of efficiency, which are commonly measured with calculations of return on assets (ROA) and return on equity (ROE). In short, the costs associated with slack, particularly available and recoverable, can be characterized as "opportunity" costs, which potentially create a drag on firm performance and efficiency.

Available Slack and Lobbying Activities

Scholars operationalize available slack in a host of ways including cash (Bizzi, 2017; George, 2005; Kim and Bettis, 2014; O'Brien and Folta, 2009), cash as a percentage of total assets (Paeleman *et al.,* 2017), the current ratio (current assets divided by current liabilities) (Hambrick *et al.,* 1996; Malen and Vaaler, 2017; Wang, 2017), the quick ratio (i.e., current assets less inventory divided by current liabilities) (Palmer and Wiseman, 1999; Smith *et al.,* 1991), and working capital to sales (i.e., current assets less current liabilities divided by sales) (Miller *et al.,* 1996). However, the measure that is most aligned with the concept of available slack is typically measured as available cash from the balance sheet. Cash is readily available and does not require the organizational procedures to extract, unlike accounts receivable or inventory, for example. For the purpose of this study, cash and cash equivalents are used as a proxy for available slack (Bizzi, 2017; Kim and Bettis, 2014).

With respect to corporate political activities, available slack is salient for a host of reasons. First, there is uncertainty associated with the frequency and magnitude of returns from lobbying activities, as well as the timing of such payoffs. In this vein, the benefits are two-fold. Available slack broadens the universe of viable lobbying investments with attractive risk/return profiles (consistent with the firm's historical comfort), while excess available slack allows for opportunities that significantly deviate from typical firm investments. In both instances, available slack resources mitigate

business risks associated with lobbying investment and therefore may motivate resource allocation to lobbying.

Second, available slack provides bargaining power to firms that engage in lobbying. While contribution limits negate some of the power large firms can wield in a particular campaign cycle, resource endowment does provide an incentive for a continued long-run alignment between politicians and the firms that influence them. In short, firms with ample available slack can make contributions year after year. In addition, available slack could be diverted to a political opponent should politician/firm goals become misaligned. Thus, more available slack should increase the efficacy of CPA initiatives.

Third, available slack is linked to strategic flexibility. Slack resources provide the ability, but not the obligation to make future investments (Tognazzo *et al.,* 2016). Available slack allows the management team to view prospective resource allocation decisions based on objective project criteria (i.e., prospective risk and return) as opposed to a biased focus on sunk costs. This is particularly relevant when considering how finite firm resources are dispersed to activities with uncertain payoffs like lobbying or how project exit decisions are executed.

Theoretically, available slack should facilitate firm spending on lobbying. On this basis, the following hypothesis was made:

Hypothesis 1 – Available slack will be positively associated with lobbying intensity.

Potential Slack and Lobbying Activities

Much like available slack, potential slack, which is measured as firm financial leverage (i.e., the debt-to-equity ratio), provides a buffer to organizations (Bizzi, 2017). Low levels of debt give management the flexibility to borrow funds to pursue new opportunities, while high levels of debt tend to constrain funding sources (Bromiley, 1991). High levels of debt also threaten the solvency of the firm, thus increasing firm risk and constraining equity financing as well. A common measure of the insolvency threat is the interest coverage ratio, which is a ratio of earnings before interest and taxes (i.e., EBIT, also commonly called operating cash flow) to interest expense from debt obligations. Higher levels of debt increase the denominator in this ratio and therefore lower the amount of coverage provided by cash flows from firm operations. In addition, debt, especially high amounts of debt, also diverts current cash flows from investible projects to interest and principal payments, further constraining managerial discretion (O'Brien *et al.,* 2014).

In general, potential slack acts as a buffer for organizations like available slack. However, the resource availability is much more uncertain since raising capital is dependent on the conditions in the external environment. Macroeconomic factors such as interest rates, inflation/deflation, and exchange rates directly influence the cost and availability of funds. In addition, lending standards exhibit considerable variance at the extremes of business cycles (i.e., tough lending standards in recessions/depressions and loosened standards during expansions). Given this variability, the expectations of using potential slack in times of need are lessened as compared to available slack.

In addition to the general buffering logic, potential slack, like available slack, provides bargaining power with actors in the political system. This potentially fosters long-term goal alignment between the firm and political actors, further reinforcing the likelihood of success from lobbying investment. Potential slack serves as a resource

endowment that suggests future contributions will be available. However, as noted previously, there is more uncertainty with potential slack than with available slack. The uncertainty may be even more magnified with respect to the impact on bargaining power in the political arena. The reasons for this are two-fold. First, political actors usually have a short-term orientation, which is usually focused on the coming election cycle. This attention is likely more aligned with a firm's available slack (i.e., cash on hand), since liquid resources can serve as a political resource in the near-term. This logic is supported by research on intertemporal choice, which has documented how decision-makers favor current consumption over future consumption (Berns *et al.*, 2007). In short, decision-makers place more value on available resources over potential resources at a future time. This, therefore, lessens the bargaining power of firms with potential slack (Bizzi, 2017). Second, an assessment of potential slack in the future requires an understanding of financial statements and fairly developed business acumen in the areas of valuation, management, and operations. According to the Congressional Research Service Survey of the 116th United States Congress, approximately 29% of its members had prior business experience. As such, it is possible that the majority of Congress may struggle with more complicated financial concepts and may incorrectly assign a lower probability of receiving potential slack resources in the future. Consequently, in the eyes of political actors, potential slack should be less meaningful, yet still positively correlated with lobbying effort.

Theoretically, potential slack should facilitate firm spending on CPA. On this basis, the following hypothesis was made:

Hypothesis 2 – Potential slack will be positively associated with lobbying intensity.

METHODS

Data and Sample

This paper relied on various data sources. First, political activity data was gathered from the Center for Responsive Politics website, a non-partisan and non-profit database of political activities including lobbying expenditures. Secondly, primary SIC code was found using the U.S. Department of Labor's Standard Industrial Classification (SIC) code system. Finally, all remaining firm financial data were drawn from the Compustat database found in the Wharton Research Data Services (WRDS) repository.

The sample consists of an unbalanced panel with 2,828 firm-year observations over the eight-year period from 2001 through 2008. This period was chosen to control for the political party in power. During this time, George W. Bush served two terms as President of the United States and, while being agnostic toward political party, the eight years of President William Clinton's administration were avoided because political activity data is only available from 1998 to the present. Additionally, due to the recession in the U.S. from 2008 to 2009, the two terms of President Barack Obama were also avoided so as not to have the confounding results from this major negative economic event.

In the analysis, both random effects and fixed effects models were estimated. Random effects models are more effective in certain situations with panel data that include time invariant variables. Time invariant data include any continuous or dichotomous data that does not vary within a unit of analysis, in this case a firm, over

time. When there are too many time invariant variables, the lack of variation within units leads fixed-effects models to be weaker or, in some instances, to be statistically insignificant. In panel data sets with time invariance issues, a random effects model is superior to fixed effects in that the weakening of models' results is not an issue since random effects model coefficients are interpreted as results across firms in the same time period and within firms in differing time periods. While no estimation technique is perfect, in this case, random effects models are more appropriate because fixed effects models are not able to be feasibly run. The random effects model in this study is as follows:

$$\text{LOBBY INTENSITY}_{it} = \beta_0 + \beta_1 (\text{FINANCIAL SLACK}_{it-1}) + \beta_2 (\text{POTENTIAL SLACK}_{it-1}) + \beta_3 (\text{PLANT PROPERTY \& EQUIPMENT}_{it}) + \beta_4 (\text{FIRM PERFORMANCE}_{it-1}) + \beta_5 (\text{LOG FIRM SIZE}_{it}) + \beta_6 (\text{AGE}_{it}) + \beta_7 (\text{INDUSTRY}_{it}) + \beta_8 (\text{YEAR}_{it}) + \varepsilon_{it}$$

Where, the subscript $i = 1,…, N$ represents each firm in the sample and $t = 1, 2, ….T$ represents each year from 2001 to 2008.

Measures

Dependent variables (DVs). To test the hypotheses, the dependent variable was *lobbying expenditures,* measured several different ways for robustness. First, lobbying expenditures were measured as the natural logged value of lobbying expenses, in dollars, by firm i in year t. Since some firms may have zero dollars of lobbying, and the natural logarithm of zero is undefined, 1 was added to each lobbying expenditure figure prior to taking the natural logarithm. Therefore, once manipulated the natural logged value of lobbying expenditures remains zero (since the natural log of 1 is 0). Secondly, lobbying intensity was measured by using the *number of lobbyists* as a dependent variable. For this measurement, a count variable was used for the number of lobbyists that a firm used in year t as collected from the Center for Responsive Politics. Finally, and as a third measure of lobbying, the number of *issues* that a firm generates on specific legislation or addressed toward a federal government division was used. This measure includes all issues that a firm brought forth to a U.S. government entity (Legislative, Regulatory, etc.) in a given year and was disclosed for reporting purposes under the Lobbying Disclosure Act of 1995. This act is the basis for all lobbying reported to the U.S. government and subsequently captured by data centers such as the Center for Responsive Politics. Issue initiation signals the intensity with which firms lobby government bodies in addition to the expenditures and number of lobbyists.

Independent variables (IVs). Corresponding to the two hypotheses, two different independent variables, each a different type of slack—Available and Potential—were measured. For additional robustness, each of the two aforementioned types of slack were measured in two different ways.

The first type of slack (Hypothesis 1) is *Available Slack*. Consistent with prior literature, the Compustat database was the source of slack data. Following Kim and Bettis (2014) and Bizzi (2017), two different measures of available slack were used. First, available slack was measured as the natural log value of cash on the balance sheet, in dollars, in the year t-1 (*Available Slack 1*). This measure of slack was utilized because cash is the most flexible type of slack and provides managers with the most discretion (Singh,

1986). In addition, and for robustness, available slack was measured as the natural logged value of working capital, defined as a firm's short-term assets less short-term liabilities in year t-1 (*Available Slack 2*).

The second category of slack incorporated into the models is *Potential Slack*, which is measured with financial leverage ratios (Bourgeois and Singh, 1983; Bizzi, 2017). First, potential slack was measured as a firm's long-term debt (LTD) to book value of equity (*Potential Slack 1*). Secondly, potential slack was measured as a firm's long-term debt to market value of equity (*Potential Slack 2*).

Control variables. Several control variables were incorporated to parse the marginal effects of the explanatory variables. *Two digit SIC codes* were utilized to control for differences across industries captured by the sample (Burns and Kedia, 2008; Hadani, 2012). Since panel data were used over an eight-year period, *Time Period* was controlled for by creating dummy variables for each year, using 2001 as the reference year.

Firm-level variables were also controlled for, which could influence political activity intensity. More specifically, *firm fixed assets* were controlled for by including the plant, property, and equipment (PP&E) figures for each firm in year *t* (Richter *et al.*, 2009). Following Mathur *et al.* (2013), Hadani (2012), and Brown (2016a), prior *firm performance* was operationalized as a firm's return on assets (ROA) in year t-1 and was calculated by taking the firm's net income divided by its total assets. Prior *firm performance* was controlled for since higher performing firms may be able to spend marginal profits on lobbying activities in future periods. *Firm size* was controlled for because size may influence the firm's ability to make investments (Sanders and Hambrick, 2007). Firm size was measured as the log of firm revenue in year *t*. Finally, firm *age* was controlled, which was measured as the firm's age in year t (Brown, 2016b).

RESULTS

Table 1 includes the descriptive statistics for the measures included in this study and Table 2 displays the pairwise correlations between variables in the data. Tables 3 to 5 report the results of the random-effects estimation calculated in STATA. There are seven models reported in each of these random-effects estimation tables. In each, Model 1 is the controls-only model and omits all explanatory variables. The next four models incorporate the independent variables that align with the two hypotheses in the paper. Table 3 reports the *Lobbying Expenditures* dependent variable, Table 4 reports the findings with the *Number of Lobbyists* dependent variable and Table 5 reports the findings from the *Issues* dependent variable. As noted above, each independent variable was measured two different ways and, therefore, in each of these three tables, Models 2 and 3 correspond with Hypothesis 1 and Models 4 and 5 correspond with Hypothesis 2.

Table 1
Summary Statistics

	Variable	Mean	S.D.
1	Lobbying Expenditures	$8.8	$6.4
2	Number Lobbyists	2.3	4.5
3	Issues	10.3	18.4
4	Firm Age	68	47
5	Firm Size	$14,915	$30,371
6	Firm Fixed Assets	$98,011	$21,920
7	Firm Prior Performance	10.7%	9.3%
8	Available Slack 1	$6.0	$1.6
9	Available Slack 2	$6.7	$1.4
10	Potential Slack 1	43.9%	17.2%
11	Potential Slack 2	39.5%	97%

N = 2,828 firm years

Lobbying Expenditures

The results displayed in Table 3 show mixed support for the hypotheses in general. Specifically, Hypothesis 1 received strong support as both cash and working capital were positive and significant (Cash B=0.320, p=0.000 and Working Capital B=0.354, p=0.001). One would interpret these results as follows. In regard to Cash (Financial Slack 1), as firms gained 10 percent in additional cash holdings, their lobbying expenditures would increase by 3.2 percent. For Working Capital (Financial Slack 2), a 10 percent increase in this metric would equate to a 3.54 percent increase in lobbying expenditures. Hypothesis 2 received no support as the coefficients on both measures of potential slack were insignificant (Potential Slack 1, B= -0.002, p=0.534 and Financial Slack 2, B= -0.125, p= 0.190).

Number of Lobbyists

In Table 4, Hypothesis 1 is once again supported as the coefficients on cash are significant and positive (B=0.225, p=0.000) as is that on working capital (B=0.122, p=0.069). Interpreting these findings, as cash increased by 10 percent, lobbying expenditures increased 2.25 percent. Likewise, as Working Capital increased by 10 percent, lobbying expenditures increased 1.22 percent. However, Hypothesis 2 did not receive support in Models 4 and 5.

Table 2
Pairwise Correlations

	$ Lobbying	# of Lobbyists	# of Issues	Revenue	PP&E	ROA	Available Slack 1	Available Slack 2	Potential Slack 1	Potential Slack 2
$ Lobbying	1									
# of Lobbyists	0.439***	1								
# of Issues	0.459***	0.652***	1							
Revenue	0.274***	0.475***	0.442***	1						
PP&E	0.280***	0.506***	0.453***	0.789***	1					
ROA	-0.016	-0.022	-0.013	0.013	-0.041**	1				
Available Slack 1	0.373***	0.409***	0.382***	0.418***	0.330***	-0.082***	1			
Available Slack 2	0.139***	0.248***	0.189***	0.229***	0.113***	0.088***	0.383***	1		
Potential Slack 1	-0.007	0.005	-0.005	0.002	0.007	-0.028*	-0.010	0.003	1	
Potential Slack 2	0.051**	0.102***	0.114***	0.175***	0.226***	-0.255***	0.070***	-0.089***	0.032*	1

*** < 0.01 ** < 0.05 * < 0.10

Table 3
Random Effects Estimation (DV=Lobby Expenditures)

	Model 1 DV Lobby Exp.	Model 2 DV Lobby Exp.	Model 3 DV Lobby Exp.	Model 4 DV Lobby Exp.	Model 5 DV Lobby Exp.
Available Slack 1 (H1)		0.320***			
Available Slack 2 (H1)			0.354***		
Potential Slack 1 (H2)				-0.002	
Potential Slack 2 (H2)					-0.125
Firm Age	0.013**	0.011**	0.011*	0.013**	0.013**
Firm Size	0.000	0.000	0.000*	0.000	0.000
Firm Fixed Assets	0.000**	0.000**	0.000**	0.000***	0.000***
Firm Prior Performance	-2.552***	-2.510**	-2.417**	-2.533**	-2.773***
Constant	7.586***	5.905***	4.823***	7.602***	7.661***
Wald Chi-Sq	268.46***	286.88***	211.71***	263.80***	245.18***
Overall R-Square	0.186	0.222	0.1905	0.1889	0.1916

N = 2,828 firm years. Year and industry dummy variables were included in this analysis but were omitted to save space in the tables.
*** < 0.01 ** < 0.05 * < 0.10

Table 4
Random Effects Estimation (DV=Number of Lobbyists)

	Model 1 DV # of Lobbyists	Model 2 DV # of Lobbyists	Model 3 DV # of Lobbyists	Model 4 DV # of Lobbyists	Model 5 DV # of Lobbyists
Available Slack 1 (H1)		0.225***			
Available Slack 2 (H1)			0.122*		
Potential Slack 1 (H2)				-0.002	
Potential Slack 2 (H2)					-0.022
Firm Age	0.006	0.005	0.004	0.006	0.006
Firm Size	0.000	0.000	0.888	0.000	0.000
Firm Fixed Assets	0.000***	0.000***	0.000***	0.000***	0.000***
Firm Prior Performance	-1.281**	-1.385**	-1.405*	-1.113*	-1.134*
Constant	2.993**	1.838	2.702**	2.973**	2.985**
Wald Chi-Sq	246.78***	282.50***	117.65***	245.81***	235.91***
Overall R-Square	0.3301	0.3501	0.2188	0.3320	0.3377

N = 2,828 firm years. Year and industry dummy variables were included in this analysis but were omitted to save space in the tables.
*** < 0.01 ** < 0.05 * < 0.10

Table 5
Random Effects Estimation (DV=Number of Issues)

	Model 1 DV - # of Issues	Model 2 DV - # of Issues	Model 3 DV - # of Issues	Model 4 DV - # of Issues	Model 5 DV - # of Issues
Available Slack 1 (H1)		0.712***			
Available Slack 2 (H1)			-0.565		
Potential Slack 1 (H2)				0.002	
Potential Slack 2 (H2)					-0.003
Firm Age	0.021	0.020	-0.003	0.021	0.016
Firm Size	0.000***	0.000***	0.000***	0.000***	0.000***
Firm Fixed Assets	0.000***	0.000***	0.000***	0.000***	0.000***
Firm Prior Performance	-4.953	-4.419	-3.552	-4.650	-2.773***
Constant	3.222	-0.763	6.750	3.184	3.382
Wald Chi-Sq	1528.05***	1527.90***	1154.15***	1515.43***	1449.17***
Overall R-Square	0.375	0.382	0.297	0.376	0.375

N = 2,828 firm years. Year and industry dummy variables were included in this analysis but were omitted to save space in the tables. *** < 0.01 ** < 0.05 * < 0.10

Issues

The findings reported in Table 5 were less supportive of the hypotheses than were those in Tables 3 and 4. Hypothesis 1 had mixed support as the coefficient on cash was significant and positive (B=0.712, p=0.008) but the coefficient on working capital was insignificant (B= -0.565, p=0.118). One would interpret this significant finding as for every increase of 1.4 percent in cash holdings one additional lobbying issue would be presented to the government. Additionally, there was no support for Hypothesis 2.

Robustness Check: Heckman Two-Step Procedure

In datasets such as the one in the present study, potential selection bias is possible and, therefore, estimated a Heckman Two-Step procedure for robustness (Heckman, 1979). The Heckman model is warranted when samples are non-random and there is a chance that omitted variables from a broader sample of firms will bias results. The first step in the Heckman Two-Step procedure is to estimate a selection equation where the control variables are regressed on the selection variable, in this case firm-level slack. In this first estimation, the dependent variable is binary and the result is a correction factor, known as the Inverse Mills Ratio (Bascle, 2008). In the second step, the Mills coefficient is then added to the original estimation equation as an additional right-hand variable to adjust for the selection bias. However, if the Inverse Mills Ratio coefficient is insignificant (p>0.05), then the conclusion is that there is no selection bias present and the original reported results are unbiased due to selection. In the Heckman equations estimated herein, the Inverse Mills Ratio was insignificant (Lamda=1259.88, p=0.344 and Lamda=912.98, p=0.223) and, therefore, selection bias is not present in the included sample.

DISCUSSION

The first theoretical contribution of this work stems from incorporating a new construct, specifically available organizational slack, into the existing theoretical model linking firm characteristics to CPA. Firm-level slack is most commonly thought of as cash on hand or working capital and, as such, these were the first set of independent variables that were measured. Hypothesis 1 tested the relationship between available slack and firm lobbying intensity as measured by lobbying expenditures (Table 3), the number of lobbyists (Table 4), and the number of legislation issues (Table 5). Testing additional lobbying measures is important because the three variables together show a firm's willingness to take the political marketplace seriously. For example, only including expenditures could make findings suspect if there are outliers that spend an inordinate amount of money contracting lobbyists. In fact, this type of spending may question how much firms are really engaged in lobbying since larger firms may just throw money at political problems. By adding in the number of lobbyists as an additional DV, an attempt was made to mitigate this since firms must spend precious resources to hire different firms that are experts in different areas of government relations. Furthering this argument, the number of issues that a firm presents to government may be even more revealing since the issues are of a more granular level and, therefore, may show the intent of the non-market resource allocation even more.

Prior research in the CPA literature suggests that firm size (employees) (Lux *et al.,* 2011), ownership structure (Hadani, 2012; Mathur *et al.,* 2013), foreignness (Kline and Brown, 2019), and CEO characteristics are antecedents of firm-level CPA. Hypothesis 1 received strong support as cash was positive and significant for all three measures of lobbying activities, and the second measure, working capital, was positive and significant for lobbying expenditures and the number of lobbyists. This suggests that there is support to add available organizational slack to the list of established antecedents of CPA, specifically lobbying intensity.

The second theoretical contribution is to the literature on organizational slack. Rather than focusing on one specific form of slack, this study examines the two forms of organizational slack, available and potential slack, thus further refining the understanding of slack resource allocation concerning non-market activities, namely lobbying activities. In this vein, the theoretical contribution is derived from inconsistent findings across the two hypotheses. As noted previously, there is strong support for the link between available slack and lobbying activities. Potential slack was added to the models as liquid assets are not always the most telling data points. However, there is no support for Hypothesis 2, which expected a positive relationship between potential slack (i.e., borrowing capacity) and lobbying intensity. This suggests an important nuance in that the sources of slack matter when considering investment in non-market activities. It appears that there is a behavioral component to allocating corporate resources to lobbying activities. While available slack can be used today with little friction, potential slack requires a few steps to access it. This not only adds complexity to decision-making, but it also injects a time component as well. Together, more friction and a temporal dimension appear to influence managerial decision-making in this domain. Adding managerial characteristics in future research may provide answers in this area.

Limitations and Future Research

This study, as with all studies, has some deficiencies. First, the sample only consists of observations from 2001 through 2008, which was a period where George W. Bush served two terms as President of the United States. Future research covering longer periods of time and capturing leadership from other political parties would help with generalizability. Second, this paper focused only on publicly traded firms lobbying the U.S. political marketplace. To add additional insight in this research domain, scholars could include multiple political contexts (i.e., European Union, South America, etc.). Studying managerial decisions in various political situations would not only elucidate cultural differences with respect to lobbying, but may also uncover nuances related to the link between organizational slack management and resource allocation. Third, this study focused solely on lobbying and organizational slack. Future research examining the relationship between firm slack and political connections or political action committees would add robustness and enhance the broader understanding of CPA. Finally, this study includes only large, publicly traded firms. This limits the generalizability of the study since these firms have easy access to capital from equity/debt issuances and short-term lending facilities. It is possible that since managers of smaller firms will have less access to capital, they will have different risk preferences related to organizational slack and priorities for how it is utilized. In addition, smaller firms generally experience higher growth rates than more mature firms, and thus may direct more resources to initiatives like increasing production or store expansion. Research capturing data from smaller, privately held firms would help uncover the underlying determinants of firm slack holdings and managerial postures toward CPA investment in another context.

Managerial Implications

Scholars have demonstrated that non-market activities such as lobbying are related to positive firm outcomes like lower tax rates (Richter *et al.,* 2009) and stock market performance (Chen *et al.,* 2014), and that there are firm characteristics such as size (Lux *et al.,* 2011) and ownership (Hadani, 2012), which are associated with lobbying activities. This paper suggests that organizational slack, specifically available slack, is another determinant of lobbying intensity. There are two general managerial implications from this body of work. The first implication is that managers should view lobbying activities as part of their universe of potential corporate projects. Allocating money to such activities should be based on estimates from common analytical frameworks considering investment costs, cash flows, and risk estimates. The second implication is viewed from more of a behavioral perspective, which is specifically related to the sources of slack linked to lobbying intensity. The findings in this paper suggest that lobbying intensity has a positive relationship with available slack, but not with potential slack. This suggests managers are comfortable allocating liquid resources to risky, uncertain projects like lobbying, but not externally sourced funds.

How can this be? The research on behavioral biases may provide some direction for this phenomenon. For example, scholars have documented mental accounting, which captures one's segmentation of resources into "accounts" for certain uses (Grinblatt and Han, 2005; Tversky and Kahneman, 1981). Perhaps managers are willing to allocate available slack (i.e., one type of mental account) for all forms or operations, but they are

only willing to tap potential slack (i.e., another type of mental account) for established market-based operations. Theoretically, all available funds should be aggregated into the overall portfolio of resources that managers can allocate to potential projects. If firms suffer from this behavioral bias, managers should recognize a need for bias training so that projects are selected based on objective data reflecting returns and risk and not sources of funds.

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Effect of Overlapping Audit and Compensation Committee Memberships on the Readability of Management Compensation Reports in the German HDAX

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Abstract: This study focuses on the relationship between board effectiveness and management compensation reporting. Specifically, the effect of overlapping memberships in audit and compensation committees (OMAC) on the readability of management compensation reports (MCR) is analyzed. Using archival data from firms listed on the German HDAX between 2014 and 2018 (329 firm-year observations) and the Flesch Reading Ease index, regression analysis shows a positive significant effect of OMAC on MCR. Similar statistical results are found in a robustness check, which refers to an alternative readability score (the Gunning Fog index). Several corporate governance and firm characteristics are included as control variables, and fixed-effects panel regressions are used. This study provides empirical support for the agency-theoretical assumption that board effectiveness and knowledge spillovers decrease conflicts of interest and information asymmetry between boards of directors and shareholders.
Keywords: audit committee, compensation committee, management compensation reporting, overlapping membership, corporate governance

This analysis deals with the relationship between overlapping memberships in audit and compensation committees (OMAC) and the readability of management compensation reports (MCR). This link is important from the perspectives of research, regulatory, and business practice. Since the 2008–2009 financial crisis, the effectiveness of the board of directors and their contributions to (non) financial reporting have been questioned (Ferrero-Ferrero *et al.*, 2012). Major concerns arise from the lack of expertise by non-executive directors, especially in countries with a two-tier system (management

board and supervisory board) (Ferrero-Ferrero *et al.*, 2012). Along with board effectiveness, the quality of management compensation disclosure has been criticized in terms of information overload and greenwashing policy (Miller, 2010; de Villiers *et al.*, 2014). Thus, international standard setters have initiated several reform initiatives to increase both corporate governance quality and compensation reporting quality. As a proxy for board effectiveness, the implementation of audit committees and compensation committees is important to increase the quality of management compensation disclosure (Liao and Hsu, 2013). According to an agency-theoretical framework, management acts opportunistically to reach individual goals, for example, shirking or consumption on the job. The literature states that executives have incentives to establish complex and non-readable management compensation reports (Coulton *et al.*, 2001). The public can hardly identify whether the management compensation system substantially contributes to incentive alignment and thus to their goals. Audit committees as a monitoring institution should contribute to higher readability of these compensation reports because of their monitoring responsibilities (Chandar *et al.*, 2012). In recent years, audit committee effectiveness has been operationalized by the overlapping memberships of audit committee and compensation committee members (e.g., Liao and Hsu, 2013; Kusnadi *et al.*, 2016; Chandar *et al.*, 2012). Compensation committees are responsible for the establishment of and change in management compensation systems. Their knowledge should also be relevant for monitoring compensation reports by audit committees. Thus, this study focuses on the effect of OMAC on MCR. This relationship has not been analyzed, and it represents a relevant research gap, especially for the German two-tier system. The motivation for exclusively using German companies in this research is the long tradition of mandatory management compensation reporting for German stock corporations in contrast to other European countries. While huge learning effects should be present in this setting, previous research has criticized the low readability of these reports in Germany and the lack of compensation-related expertise on supervisory boards (Richter and Kinne, 2017). Even if management compensation systems are very complex in business practice and its disclosure lacks objectivity, German supervisory boards only work part-time. Moreover, not every member of the supervisory board has adequate expertise and experience in (non) financial reporting, auditing, and compensation-related issues. Unlike firms with one board of directors, information asymmetries and conflicts of interest between the management board and the supervisory board are higher by tendency. OMAC can increase the efficiency within supervisory boards in German stock corporations and promote their monitoring duties. Thus, the following research question is addressed in this analysis: Does the effectiveness of supervisory boards through the recognition of OMAC have a positive effect on MCR?

After the European Union (EU) audit reform of 2014, every member state decided whether stock corporations should establish audit committees. In Germany, according to the Transformation Act of 2016, the implementation of supervisory board committees is still voluntary. However, the German Corporate Governance Code (GCGC) as a "soft-law" system recommends the implementation of audit committees (GCGC, 2019). The majority of German HDAX companies have established audit committees as the best practice (von Werder and Turkali, 2015). Neither the EU nor the German law includes mandatory rules on the implementation of compensation committees. As a result, the establishment of both committees is voluntary in German stock corporations. Unlike in

other European countries, management compensation reports as part of the management report ("*Lagebericht*") were mandated in 2005 in Germany. As a reaction to the 2008–2009 financial crisis, the European standard setter established mandatory management compensation reporting according to the 2017 modernized shareholder rights directive (EC, 2017). Starting in the business year 2021, the new MCR will become a separate reporting document in addition to financial reports, other non-financial reports, and corporate governance reports. As the new management report has to be approved by the shareholders on a yearly basis as "say on pay" votes, the European Commission (EC) explicitly stresses the need for high-quality compensation reporting (EC, 2017). Thus, the readability of compensation reports is a useful proxy for reporting quality in this context.

Similar research has not been conducted on the effect of compensation committees on compensation reporting. Some studies found a positive effect of the implementation of compensation committees (Nelson and Percy, 2005), size and meeting frequency of compensation committees (Laksmana, 2008; Schiehll *et al.*, 2013; Kang and Nanda, 2018) on compensation reporting quality. OMAC as a board effectiveness variable has been linked to financial reporting studies (Velte, 2017; Kalelkar, 2017; Shankaraiah and Amiri, 2017; Fernandez-Mendez *et al.*, 2017; Habib and Bhuiyan, 2016; Kusnadi *et al.*, 2016; Liao and Hsu, 2013; Chandar *et al.*, 2012; Chang *et al.*, 2011). OMAC represents increased expertise and knowledge spillover that lead to increased monitoring quality in the audit committee (Habib and Bhuiyan, 2016). However, OMAC may also cause audit committee members to become "too busy," thus decreasing their effectiveness (Kalelkar, 2017; Laux and Laux, 2009; Tanyi and Smith, 2015).

This work is the first analysis on the link between OMAC and MCR. Germany was chosen as a classical representative of a continental European code law regime with a two-tier system. Since 1931, Germany has a long tradition of mandatory compensation reporting in contrast to other European countries. While learning effects of the management board and supervisory board are realistic, several regulations on MCR have been conducted in the past several years (e.g., in 2005, 2009, and 2019). The literature criticizes the high complexity and low MCR by German stock corporations (Richter and Kinne, 2017). Thus, the readability of compensation reporting as an alternative measure of quality is the focus in this study. In the German two-tier system, supervisory boards work part-time and can have up to 21 members, but not every member has special experience and expertise in (non) financial reporting and auditing and compensation-related issues. Thus, to increase board effectiveness, supervisory boards are flexible in establishing audit and compensation committees, as no legal obligation exists. There should be relevant knowledge spillover between these two committees by monitoring compensation reports. Overlapping memberships in both committees can promote board effectiveness with regard to the need for expertise in the disciplines of auditing and compensation.

This study addresses the link between OMAC in German HDAX firms (329 firm-year observations) and the MCR for the business years 2014–2018. Regression analysis indicates that OMAC is linked to an increased MCR based on the Flesch Reading Ease index. The findings are robust to the alternative readability score (i.e., the Gunning Fog index) and are consistent with previous research, which shows a positive effect of other compensation committee variables on compensation reporting quality (Nelson and Percy, 2005; Laksmana, 2008; Schiehll *et al.*, 2013; Kang and Nanda, 2018).

The results have huge implications for regulatory, practical, and research discussions. First, regulators are made aware of the improved audit committee effectiveness by OMAC. As the implementation of either committee is mandatory by law for German stock corporations, the results show how it may be useful to discuss stricter regulations on board composition. Second, from a business practice view, information processes within supervisory boards should be improved to increase the readability of compensation reporting. Overlapping members' knowledge spillover can be linked to an increased understanding of both financial and compensation reporting. With respect to individual circumstances in the communication processes of supervisory boards and their committees, a positive effect of overlapping memberships on supervision depends on firm-specific circumstances (e.g., branch of industry, firm size, firm risk). Third, from a research perspective, future researchers should use other compensation reporting proxies (e.g., quality scores). Other research methods (e.g., experimental designs) are also useful to analyze the motives and reactions of OMAC. Aside from the linear relationship in this model, future research should also test a non-linear direction and include other overlapping attributes, such as overlapping memberships between audit committees and risk committees, nomination committees, or sustainability committees.

The remainder of this analysis is organized as follows. First, the agency-theoretical framework, the literature review on the link between board effectiveness and compensation reporting, and the hypothesis are discussed. Second, the research design, sample, and descriptive statistics are presented. Finally, the empirical results of the correlation and regression analyses with checks for robustness, limitations, and recommendations for future research are given.

AGENCY-THEORETICAL FRAMEWORK, LITERATURE REVIEW, AND HYPOTHESIS

Principal Agent Theory

According to principal agent theory (Ross, 1973; Jensen and Meckling, 1976; Tirole, 1986), both audit committees and compensation committees, as two key board committees, should decrease information asymmetry and conflicts of interest between top management and shareholders (Velte, 2017). Management compensation reporting is a relevant information instrument for shareholders and other stakeholder groups (Laksmana *et al.*, 2012), and it is linked to increased managerial discretion. Given the lack of standardization and narrative disclosures, the comparability of compensation reports is low (Richter and Kinne, 2017). Agency conflicts due to the low MCR can be prevented by audit committees and compensation committees. One of the goals of audit committees is to monitor (non) financial reports, such as compensation reports. Compensation committees support non-executive directors in implementing and updating an incentive-based executive remuneration system. Both committees monitor institutions to decrease agency problems within corporations. These committees should pave the way for a more incentive-based executive compensation system and an increased transparency of compensation reports. Therefore, Laux and Laux (2009) find that compensation committees increase the use of pay-for-performance of chief executive officer (CEO) compensation, such as stock-based payments, for better management incentives consistent with shareholders' interests. For a financial market crisis, Laux and Laux (2009) present a theoretical model and find that the presence of

a compensation committee can increase the use of pay-for-performance CEO compensation, such as stock-based payments, for better management incentives consistent with shareholders' interests because of the increased compensation-related expertise of the board. These increased monitoring costs by the compensation committee will be borne by the audit committee. Consequently, the total monitoring costs in both committees will be lower and (non) financial reporting quality will be higher in view of knowledge spillover (Laux and Laux, 2009). OMAC may also curb the increase in pay-for-performance compensation, as it contributes to a better understanding of pay-for-performance compensation, increased experience, and expertise with MCR.

Agency conflicts are not only relevant in shareholder value-oriented and market-dominated regimes (case law regimes) with one board of directors (one-tier system; e.g., United Kingdom and the United States) but also in stakeholder value-oriented (code law regimes) and bank-dominated financial systems with a management board and a supervisory board (two-tier system; e.g., Germany, Austria, and France). Elston and Goldberg (2003) illustrate similar agency problems in the US and German capital markets. German stock corporations must implement a management board (as executive directors) and a separate supervisory board (as non-executives). The management board leads the firm, and the supervisory board monitors the activities of the management board (Elston and Goldberg, 2003). Unlike in a one-tier system, information asymmetry and conflicts of interest between management boards and supervisory boards are higher by tendency. According to principal agent theory, the management board has different goals (e.g., shirking, consumption on the job) compared with the supervisory board and the shareholders. As the management board is better informed than the supervisory board, implementing an incentive-based compensation system is a great challenge for supervisory boards. As supervisory boards in Germany work part-time and receive a significant lower compensation than one-tier systems, management reporting and their disclosure represent a major instrument for reducing agency problems within German stock corporations.

Literature Review and Deduction of Hypothesis

The number of empirical-quantitative studies on the effect of corporate governance on compensation reporting is low compared with those on other (non) financial reporting items (Nelson *et al.*, 2010). Some studies have found a positive effect of board effectiveness on compensation reporting quality. According to Nelson and Percy (2005), the implementation of compensation committees increases compensation reporting quality in the Australian capital market. Nelson *et al.*'s (2010) study shows that the meeting frequency of audit committees and the choice of a big four audit firm positively affect the quality of management compensation reports. Laksmana (2008) conducts a study on the US capital market and finds a positive relationship between either the board size and meeting frequency of the board of directors and compensation committees and the transparency of compensation reports. In a Brazilian sample, the existence of a compensation committee and the choice of a big four audit firm leads to an increased quality of compensation reports (Schiehll *et al.*, 2013). Furthermore, Kang and Nanda (2018) find a positive effect of the implementation of compensation committees and the quality of management compensation reporting. In accordance with compensation reporting, previous researchers have assumed a positive effect of audit committee effectiveness on other types of non-financial reporting, such as sustainability

reports (Alotaibi and Hussainey, 2016; Khan *et al.*, 2013; Rouf, 2011; Said *et al.,* 2009).

Empirical research on (non) financial reporting quality usually relies on content analysis and a self-created disclosure index (scores). However, the literature stresses the low validity of this research method given the increased subjectivity of (un)weighted disclosure scores (Bloomfield, 2008; Li, 2008). In the last decade, an increased number of researchers have analyzed narrative reporting instruments using *readability indices*. This includes the relationship between firm characteristics and the readability of CSR reports (Bakar and Ameer, 2011; Nazari *et al.,* 2017), integrated reports (Melloni *et al.*, 2017; Velte, 2018; Roman *et al.*, 2019; Wang *et al.*, 2018), management's discussion and analysis sections (Ben-Amar and Belgacem, 2018), and management reports (Laksmana *et al.,* 2012; Hooghiemstra *et al.,* 2017). Velte (2018) examines a sample of EU public interest entities and finds a positive effect of (combined) financial and sustainability expertise within audit committees and the readability of integrated reports. Laksmana *et al.* (2012) examine the link between the readability of the compensation discussion and analysis section in proxy statements and the pay-for-performance sensitivity of CEO compensation. They find a low readability of disclosure through excessive CEO remuneration. According to Hooghiemstra *et al.* (2017), excessive CEO pay and less readable management reports lead to a reduced say on pay voting dissent. Thus, the readability of management reports is relevant for shareholders and other stakeholders.

To date, no empirical analysis on the link between OMAC and management compensation readability has been conducted. Previous empirical research on OMAC has mainly concentrated on financial reporting quality. According to Velte (2017), as it is also linked to the German two-tier system, OMAC contributes to lower discretionary accruals and thus better financial reporting quality. Other similar research designs related to other regimes (e.g., Spain, United States, and Australia) support this relationship (Fernandez-Mendez *et al.,* 2017; Kalelkar, 2017; Habib and Bhuiyan, 2016; Chandar *et al.,* 2012). In view of the results of previous research on related board effectiveness variables, a positive effect of OMAC on MCR is assumed.

Germany can be classified as an interesting setting for this research. In contrast to those of other European countries, German stock corporations have a long tradition of mandatory management compensation reporting since 1931, and thus they should have appropriate learning effects in the last decades. However, previous research has criticized the low readability of these reports and the lack of compensation-related expertise within supervisory boards (Richter and Kinne, 2017). As a reaction to the low quality of management reports, the German legislator increased the contents of management compensation reports several times (e.g., in 2005, 2009, and 2019). Thus, it is questionable whether the effectiveness of supervisory boards by OMAC can increase MCR. In view of these arguments, the German setting is useful to address this research question and contributes to the latest European regulation on management compensation reporting and shareholder rights in 2017. The European Commission explicitly criticized the huge complexity and low quality of compensation disclosure among the EU member states, and the aim of the new EU directive on shareholder rights is to increase the readability of these disclosures (EC, 2017). A "new" management compensation report will be mandatory for EU member states and for German stock corporations beginning in the business year 2021. The results of this study are transferable to other European member states with a two-tier system (e.g., Austria and France) and a code law tradition.

In accordance with principal agent theory (Ross, 1973; Jensen and Meckling, 1976; Tirole, 1986) and previous research results, OMAC should lead to increased board effectiveness. Higher board effectiveness is associated with better monitoring of (non) financial reporting and management incentives to increase MCR. Therefore, the following hypothesis is stated (H1):

> **H1:** *Overlapping membership in audit and compensation committees (OMAC) leads to increased readability of management compensation reports (MCR).*

An alternative relationship between OMAC and MCR can also be found in the literature. Although OMAC is connected with knowledge spillover, according to the busyness hypothesis, the monitoring quality of the board and its committees decreases when their members are busy (Tanyi and Smith, 2015). If the members of the supervisory board in the setting are too busy to conduct their monitoring duties in view of the management compensation system and reporting, OMAC may not increase MCR or even reduce them. Following this argument, Liao and Hsu (2013) and Chang *et al.* (2011) find a negative effect of OMAC on earnings quality. Thus, the null hypothesis (H0) is as follows:

> **H0:** *OMAC and MCR are not related or negatively associated.*

RESEARCH DESIGN

The German Setting

The German capital market is chosen for these reasons. First, Germany is an insider system of corporate governance, with low effect from external monitoring by investors and a dominance on creditor protection (e.g., banks). Corporate governance is mainly con-ducted through monitoring of the supervisory board. German stock corporations have a two-tier system with separate management and supervisory boards. By tendency, in comparison with the one-tier-system, supervisory boards are more independent but have less industry and business experience and expertise. This can lead to increased agency problems (conflicts of interest and information asymmetries) between the management board and the supervisory board. The implementation of an incentive-based management compensation system and its readable disclosure is a major challenge in reducing agency conflicts. Second, as efficiency within the supervisory board of German stock corporations can be impaired by the diverse composition of its members, their part-time work, and size (up to 21 members), the implementation of audit and compensation committees as part of the supervisory board is a relevant challenge in Germany. The implementation, develop-ment, and monitoring of management compensation reports require combined expertise of accounting, audit, and compensation-related aspects. The literature stresses the low expertise of German supervisory boards in management compensation and the huge complexity of management compensation systems (Richter and Kinne, 2017). Thus, supervisory boards engage external consultants to implement compensation systems, which can lead to agency problems. As the combined expertise of (non) financial reporting, audit, and compensation-related issues is required, overlapping memberships in both committees

(audit and compensation) can increase the degree of expertise of both committees and the supervisory board. Thus, monitoring of the management compensation report will be stricter and will motivate the management board to publish more readable reports. These issues promote the relevance of the German setting, which is important for addressing the research question and the main hypothesis. Although this study is not directly transferable to one-tier systems and case law regimes, the new EC directive on shareholder rights in 2017 can lead to standardization and an increased comparability of compensation reports among EU member states. Germany, as one of the leading EU economies and with a long tradition of mandatory compensation reporting for stock corporations, may represent a major role in the political discussion on the relevance of the new regulations.

Sample Selection

The initial sample was represented by 110 German companies listed on the HDAX for the business years 2014–2018 (Table 1). Financial institutions were excluded because of their specific asset structure, financial leverage, and reporting and compensation standards and practices (Frias-Aceituno *et al.*, 2013). Several companies in the sample do not implement committees because of the small size of the supervisory board, and thus these firms are excluded. Given the small number of missing firms, the use of a two-stage approach and the inverse mills ratio as instruments for potential sample bias problems is not required in this study. Firms with no fully available compensation reports in this timeframe and firms with missing values on the control variables were also excluded. The final sample consists of 329 firm-year observations in 2014–2018. Table 1 summarizes the sample selection process. Data on OMAC are hand-collected from annual, corporate governance, and sustainability reports.

Table 1
Sample Selection

	2014	2015	2016	2017	2018
listed companies on the German "HDAX" (DAX30, TecDAX, MDAX)	110	110	110	110	110
-financial institutions	9	9	9	8	8
-companies without audit committees	16	15	15	15	14
-companies with missing values on dependent and control variables	20	20	21	21	21
final sample	65	66	65	66	67

The effect of OMAC on MCR is highlighted in the regression model. Based on the significant Lagrange multiplier test, F-test for overall significance, and Hausman test, a panel data regression model with firm and time fixed-effects is used. The Durbin-Wu-Hausman test is the model most commonly used to check for endogeneity and the choice of relevant regression models. This test is conducted to choose either the random effects

or the fixed-effects model for the various regression analyses.[1] Based on the results, the fixed-effects model is used. Regression analysis with fixed effects minimizes the risk of omitted variable bias. The variance inflation factor (VIF) is calculated to test for multicollinearity. If the VIF is higher than 10, severe multicollinearity problems may occur (Hair *et al.*, 2009). However, no VIF exceeds 3.29 in the data, and thus multicollinearity does not affect the results. The basic regression model is presented in Equation 1 as follows:

(1) $MCR_{it} = \beta_0 + \beta_1 x\ OMAC_{it} + Sum\ \beta_2 x\ control\ variables_{it} + \varepsilon_{it}.$

Dependent and Independent Variables

The dependent variable is MCR. Previous empirical studies on the link between board effectiveness and management compensation reports have relied on the content analysis of these reports and a scoring model (e.g., Kang and Nanda, 2018). However, disclosure indices and scoring models are associated with increased subjectivity with regard to the lack of standardization of management compensation reports (Clarkson *et al.*, 2006). Therefore, the literature proposes the use of textual analysis to analyze the readability of (non) financial reports (Li, 2008).

In accordance with sustainability and corporate governance reports, the quality of management compensation reporting can be reduced through information overload and self-impression management (Miller, 2010; de Villiers *et al.,* 2014). Management compensation systems are complex, and supervisory boards in listed corporations often use external compensation consultants as support. To be useful for stakeholders, compensation reports must be understandable. Reports that lack clarity cannot positively affect firms' reputation or performance but may have a negative effect (Clarkson *et al.,* 2006). Given these challenges, this study uses MCR as the dependent variable, includes the criteria of clear and concise wording, and improves the value of information for stakeholders. Previous research on readability has mainly used the Flesch Reading Ease and the Gunning Fog indices (Loughran and McDonald, 2014; 2016). The Flesch Reading Ease index is used first to analyze how easy or difficult the English version of the management compensation report is to read (Li, 2008). Formula (2) provides Flesch Reading Ease scores (Li, 2008):

(2)   *206.835 – 1.015 (total words/total sentences) – 84.6 (total syllables/total words).*

Higher scores indicate that management compensation reports are easier to read. Given the heterogeneity of management compensation reports in business practice, such as the lack of standardization of contents or the use of qualitative information to describe the management system, analyzing MCR is not easy. In the present study, the Flesch Reading Ease score is transformed into the MCR score, as shown in Table 2. Seven scores are associated with specific limits of the index from 0 to 100. The range goes from extremely difficult to extremely easy to read.

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[1] The null hypothesis of the Hausman test implies that the difference in coefficients is not systematic and preferred model is random effects. Further, this study selects 5% as the level of significance for each regression model. The Hausman test shows that fixed effects are present for regression equation (p-values: 0.0303 (H1)).

Table 2
Flesch Reading Ease Score

Flesch Reading Ease	Notes	Score
0.0-30.0	Very difficult to read	1
30.0-50.0	Difficult to read	2
50.0-60.0	Fairly difficult to read	3
60.0-70.0	Plain English	4
70.0-80.0	Fairly easy to read	5
80.0-90.0	Easy to read	6
90.0-100.0	Very easy to read	7

OMAC represents the independent variable as the proportion of audit committee members who also sit on the compensation committee.

Control Variables

First, consistent with similar research (Nelson and Percy, 2005; Nelson *et al.,* 2010; Laksmana, 2008; Kang and Nanda, 2018), other audit and compensation committee items are used as control variables: the ratio of female and independent members in the audit committee (AC_GEND and AC_IND), the logarithm of the size of the audit (compensation) committee (AC_SIZE and CC_SIZE), and the logarithm of the number of meetings of the audit (compensation) committee during the fiscal year (AC_MEE and CC_MEE). Second, supervisory board items are included as controls: the logarithm of the size and the meeting frequency of the supervisory board (B_SIZE and B_MEE). A dummy variable is used to indicate whether the supervisory board or the compensation committee has engaged an external compensation consultant (ECC). AUDF is recognized as the ratio of audit-related fees to total fees paid to the external auditor. This item represents auditor independence and should be positively related to cooperation with the supervisory board (Velte, 2017; 2018). Third, firm characteristics are integrated, such as accounting-based performance (return on assets [ROA]), market-based performance (Tobin's Q), firm size (total assets [SIZE]), and firm risk (BETA for systematic firm risk and DEBT for unsystematic firm risk). The branch of industry (IND) may also influence board composition and compensation reporting. Table 3 summarizes the variables.

Table 3
Variables of the Empirical Study

	explanation
dependent variable	
MCR	Readability of management compensation reports (as a subcategory of the management report according to German commercial law), measured by the Flesch Reading Ease score (see Table 3)
independent variables	**explanation**
OMAC	proportion of audit committee members who also sit on the compensation committee
control variables corporate governance-specific:	
AC_GEND	Percentage of female members in the audit committee (as reported)
AC_IND	Percentage of independent members in the audit committee (as reported)
AC_MEE	Logarithm of number of audit committees' annual meetings during the fiscal year (as reported)
AC_SIZE	Logarithm of number of supervisory board members serving on the audit committee during the fiscal year (as reported)
CC_SIZE	Logarithm of number of supervisory board members serving on the compensation committee during the fiscal year (as reported)
CC_MEE	Logarithm of number of compensation committees' annual meetings during the fiscal year (as reported)
B_SIZE	Logarithm of number of members serving on the supervisory board during the fiscal year (as reported)
B_MEE	Logarithm of number of annual meetings of the supervisory board during the fiscal year (as reported)
ECC	Dummy variable if the supervisory board or the compensation committee engages an external compensation consultant during the fiscal year (1= yes, otherwise = O) (as reported)
AUDF	Ratio of audit-related fees to total fees paid to the external auditor (Datastream)
Firm specific:	
ROA	Return on Assets = Net income before preferred dividends + ((interest expense on debt – interest capitalized) * (1 - tax rate))/average of last year's and current year's total assets (Datastream)
Tobin's Q	market value of equity and liabilities/book value of equity and liabilities (Datastream)
SIZE	Logarithm of total assets (firm size) (Datastream)
BETA	Beta factor (systematic firm risk) (Datastream)
DEBT	Total debt/total assets (unsystematic firm risk) (Datastream)
IND	dummy variable for (1) manufacturing and (2) services (branch of industry) (Datastream)

Descriptive Statistics

Table 4 presents an overview of how the readability of compensation report scores has evolved over time. Table 5 lists the descriptive statistics of the variables. To eliminate the potential effects of outliers, the continuous variables are winsorized at the 1st and 99th percentiles. The compensation reporting mean scores for business years 2014–2018 do not change significantly from 26.5 in 2014 to 26.9 in 2018. During the whole time period, the compensation reports are extremely difficult to read. Thus, the risk of information overload may be high. As shareholders and other stakeholders cannot easily analyze information in the management compensation report and can hardly examine the management compensation system, the decision usefulness of the reports has to be questioned.

Table 4
Development of MCR

Readability index	2014	2015	2016	2017	2018
Flesch Reading Ease Score	26.5	26.0	26.7	27.1	26.9

Table 5
Descriptive Statistics

Variables	Mean	SD	Median	Min	Max
MCR	26.640	2.546	27.703	15.643	34.486
OMAC	0.325	0.204	0.335	0.000	0.500
AC_GEND	0.253	0.205	0.232	0.000	0.667
AC_IND	0.315	0.197	0.343	0.000	0.721
AC_MEE	1.253	0.202	1.143	1.089	2.253
AC_SIZE	2.242	0.487	2.014	1.142	2.142
CC_SIZE	2.140	0.531	2.142	1.043	2.313
CC_MEE	1.354	0.264	1.241	1.124	2.353
B_SIZE	2.276	0.726	2.347	1.102	3.041
B_MEE	1.846	0.347	1.714	1.214	2.567
ECC	0.000	1.000	0.500	0.000	1.000
AUDF	0.687	0.193	0.694	0.081	1.000
ROA	0.054	0.154	0.046	-0.064	0.244
TOBIN's Q	2.045	1.353	1.948	0.043	6.859
SIZE	12.759	2.898	13.423	8.439	17.428
BETA	0.451	0.154	0.425	0.014	1.898
DEBT	0.321	0.192	0.312	0.000	0.741
IND	0.000	0.000	0.500	0.000	1.000

Notes: This table represents the descriptive statistics for MCR, OMAC and control variables used in this study.

Table 5 indicates that, on average, 32.5% of the audit committee members also sit on the compensation committee (with a median of 33.5%). On average, the ratio of female and independent audit committee members is moderate (mean: 25.3% and 31.5%; median: 23.2% and 34.3%, respectively). The majority of firms do not report that they engaged an ECC (mean: 0; median: 0.5). The majority of audit fees paid to external auditors are linked to audit duties and not to other (consulting) services that may lower auditor independence (mean: 68.7%; median: 69.4%).

EMPIRICAL RESULTS

Correlation Analysis

Table 6 shows the Pearson's correlation coefficients. OMAC is positively correlated with MCR. AC_GEND, AC_IND, CC_MEE, B_MEE, and ECC as other corporate governance variables are positively related to MCR. A positive and significant correlation is found between OMAC and AC_GEND, AC_IND, AC_MEE, B_MEE, and ECC as other corporate governance variables.

Regression Analysis

Table 7 summarizes the results of the regression analysis. OMAC is positively and significantly related to MCR. Thus, Hypothesis 1 is supported. This result is consistent with previous research (Nelson and Percy, 2005; Nelson *et al.,* 2010; Laksmana, 2008; Kang and Nanda, 2018), that indicates a positive effect of compensation committees on management compensation reporting. With regard to Laux and Laux's (2009) theoretical model, OMAC is associated with knowledge spillovers, which are important for the monitoring role of audit committees. With regard to corporate governance variables, a positive and significant relationship is found between MCR and the following corporate governance variables: AC_GEND, AC_IND, CC_SIZE, B_SIZE, and ECC. Tobin's Q is positively related to MCR, and DEBT is negatively related to MCR.

Table 6
Correlation Matrix

Variables	MCR (1)	OMAC (2)	AC_GEND (3)	AC_IND (4)	AC_MEE (5)	AC_SIZE (6)	CC_SIZE (7)	CC_MEE (8)
(1)	1.000							
(2)	0.313**	1.000						
(3)	0.243*	0.217*	1.000					
(4)	0.214*	0.203*	0.253*	1.000				
(5)	0.039	0.341**	0.211*	0.325**	1.000			
(6)	0.154	0.253*	0.326**	0.231*	0.213	1.000		
(7)	0.241	0.145	0.157	0.145	0.323*	0.221	1.000	
(8)	0.243*	0.289*	0.255	0.164	0.313**	0.232*	0.151	1.000
(9)	0.153	0.098	0.214	0.254*	0.224*	0.006	0.212*	0.224
(10)	0.243*	0.213*	0.254*	0.154	0.255*	0.153	0.024	0.154
(11)	0.424**	0.314**	0.224	0.351**	0.142	0.211*	0.114	0.069
(12)	0.296	0.213	0.326**	0.323**	0.048	0.144	0.241*	0.212*
(13)	0.243*	0.241	0.254*	0.135	0.279	0.342**	0.311**	0.051
(14)	0.251	0.351	0.253	0.241	0.153	0.114	0.053	-0.141
(15)	0.041	0.141	0.322**	0.036	0.045	0.065	0.113	0.131
(16)	-0.231*	-0.242*	-0.248	0.076	0.056	0.143	0.046	0.065
(17)	-0.267*	-0.141	-0.058	0.154	0.213*	0.113	0.241*	0.155
(18)	0.141	0.241*	0.153	0.081	0.133	0.254*	0.005	0.311**

Table 6 (continued)

Variables	B_SIZE (9)	B_MEE (10)	ECC (11)	AUDF (12)	ROA (13)	Tobin's Q (14)	SIZE (15)	BETA (16)	DEBT (17)	IND (18)
(1)										
(2)										
(3)										
(4)										
(5)										
(6)										
(7)										
(8)										
(9)	1.000									
(10)	0.112	1.000								
(11)	0.232*	0.212*	1.000							
(12)	0.113	0.055	0.235	1.000						
(13)	0.152	0.042	0.163	0.231*	1.000					
(14)	0.144	0.111	0.114	0.343**	0.023	1.000				
(15)	0.213*	0.131	0.034	0.265**	0.056	0.138	1.000			
(16)	0.008	0.014	0.325**	0.053	0.141	0.142	0.123	1.000		
(17)	0.024	0.224*	-0.153	0.142	0.113	0.275*	0.257*	0.152	1.000	
(18)	0.153	0.113	0.142	0.223	0.058	0.242*	0.168	0.274	0.074	1.000

Notes: This table presents the Pearson's correlation analysis between MCR, OMAC and control variables. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels respectively (two-tailed test).

Table 7
Regression Analysis (MCR based on Flesch Reading Ease readability index)

Variables	MCR (Flesch Reading Ease index)	
	Coef.	p-value
OMAC	2.759**	0.042
AC_GEND	1.797**	0.039
AC_IND	2.142**	0.041
AC_MEE	1.424	0.164
AC_SIZE	1.567	0.140
CC_SIZE	2.225*	0.064
CC_MEE	1.656	0.148
B_SIZE	1.665*	0.078
B_MEE	2.118*	0.058
ECC	3.114***	0.001
AUDF	0.838	0.114
ROA	0.159	0.221
Tobin's Q	1.221*	0.085
SIZE	2.142	0.212
BETA	-1.242	0.197
DEBT	-1.132**	0.075
IND	0.141	0.232
INTERCEPT	-1.869	
Firm fixed effects	YES	
Time fixed effects	YES	
(adj.) R^2	0.249	
F stat.	2.342**	
Observations	329	

Notes: This table represents panel regression analysis of the impact of OMAC and the control variables on MCR (Flesch Reading Ease) as proxy for readability of management compensation reporting. Robust and clustered (by firm) standard errors are reported in parentheses. The p values are two-tailed. The symbols ***, **, and * indicate significance at the 1, 5, and 10% level, respectively.

Robustness Test: Modification of the Readability Score (Gunning Fog Index)

Further analyses are conducted to check the robustness of the results (Table 8). To confirm that OMAC has a significant positive effect on MCR, an alternative measure of the dependent variable is used. In the main regression, the Flesch Reading Ease index is included. The Gunning Fog index, an equally well-known readability index in empirical accounting research (Loughran and McDonald, 2014; 2016), was chosen for the robustness check. This index appears in the literature on computational linguistics, and it was introduced into empirical accounting research by Li (2008).

The Gunning Fog index captures text complexity as a function of syllables per word and words per sentence (Li, 2008). Scores are calculated using formula (3):

(3)   *Fog = 0.4 * (words per sentence + percentage of complex words),*

in which complex words are defined as words with three syllables or more. The association between the Gunning Fog index and MCR is as follows:

- at least 18: "unreadable,"
- 14–18: "difficult to read,"
- 12–14: "ideal,"
- 10–12: "acceptable," and
- 8–10: "childlike."

Unlike in the Flesch Reading Ease index, a negative relationship between the Fog index and OMAC indicates that MCR is increased by OMAC. To increase comparability with the main regression model, MCR is multiplied by (−1). After conducting the regression analysis, OMAC contributes positively to MCR (Table 8). Thus, the main results remain robust, and Hypothesis 1 is supported.

Table 8
Robustness Test (MCR based on Gunning Fog readability index)

Variables	MCR (Gunning Fog index)	
	Coef.	p-value
OMAC	2.365**	0.038
AC_GEND	1.568**	0.041
AC_IND	2.056**	0.036
AC_MEE	1.676*	0.067
AC_SIZE	1.442	0.129
CC_SIZE	2.676	0.112
CC_MEE	2.221*	0.688
B_SIZE	1.332	0.121
B_MEE	1.789*	0.062
ECC	2.989**	0.021
AUDF	0.989	0.134
ROA	0.121	0.209
Tobin's Q	1.543*	0.079
SIZE	2.098	0.177
BETA	-1.136	0.154
DEBT	-1.267**	0.070
IND	0.113	0.198
INTERCEPT	-1.722	
Firm fixed effects	YES	
Time fixed effects	YES	
(adj.) R²	0.229	
F stat.	2.112**	
Observations	329	

Notes: This table represents panel regression analysis of the impact of OMAC and the control variables on MCR (Gunning Fog) as proxy for readability of management compensation reporting. Please note that the Fog index is an inverse measurement of readability, thus multiplied by (–1). Robust and clustered (by firm) standard errors are reported in parentheses. The p values are two-tailed. The symbols ***, **, and * indicate significance at the 1, 5, and 10% level, respectively

CONCLUSION

Both board effectiveness and (non) financial reporting have been subjects of controversy since the 2008–2009 financial crisis from the research, regulatory, and practical perspectives. International standard setters have finalized several reform initiatives on sustainable corporate governance, which affects board composition (e.g., implementation of committees) and compensation reporting (e.g., EC, 2017). The current study examines OMAC and its effect on MCR. A sample of firms listed on the German HDAX (329 firm-year observations) for the business years 2014–2018 is selected. OMAC, as the independent variable, is hand-collected. The Flesch Reading Ease index is used to measure MCR as the dependent variable. The regression analyses indicate that OMAC is positively related to MCR. This knowledge spillover is important for the monitoring duties of audit committees with regard to MCR (Liao and Hsu, 2013). The research findings are robust to an alternative measure of readability (Gunning Fog index). This study is based on Laux and Laux's (2009) study, which assumes that overlapping memberships can be linked to increased skills of pay-for-performance compensation and management incentives.

The results are consistent with previous research (Nelson and Percy, 2005; Nelson *et al.,* 2010; Laksmana, 2008; Kang and Nanda, 2018). They provide evidence of a positive effect of board effectiveness on management compensation reporting. To the best of knowledge, this work is the first on the relationship between OMAC and MCR. German stock corporations are the focus because they have a long tradition of mandatory management compensation reporting compared with other countries. Despite this long tradition, their quality of compensation disclosure is low and difficult to read for shareholders. With regard to the special two-tier system, agency problems (information asymmetries and conflicts of interest) among the management board, supervisory board, and shareholders can lead to low board effectiveness. As German supervisory boards have also been criticized about their lack of expertise and increased busyness, the implementation of audit committees and compensation committees is useful to increase the monitoring quality of compensation reports. As the combined expertise related to (non) financial reporting, auditing, and compensation-related issues is needed, overlapping memberships in both committees are associated with knowledge spillover and a better motivation for the management board to present readable reports to the public.

The results are relevant for regulatory, practical, and research aspects. First, these results may motivate standard setters to promote the role of audit committees and compensation committees, as their implementation is still voluntary in German listed corporations. Second, from a business practice perspective, the positive relationship between OMAC and MCR depends on many firm-specific circumstances and should be analyzed in more detail because of the individual circumstances in the communication processes of supervisory boards and their committees. Industry, firm size, firm risk, and other factors outside the topic of corporate governance should be further analyzed. For example, the range and structure of management compensation are dependent on the branch of industry, specific firm risks (e.g., climate change risks, digital transformation challenges), and firm size (listing requirements). Third, from a research perspective, primary data are needed to examine the motives and reactions of overlapping memberships. In this context, other committees can be included, such as overlapping

memberships between audit committees and risk committees, nomination committees, or sustainability committees.

This study has some limitations. First, referring to a specific and rather short time period (2014–2018), this study offers limited insights, as regulatory changes in sustainable corporate governance after the 2008–2009 financial crisis require long-term studies. Second, only one measure of board effectiveness is included. Management compensation reporting can be used as a symbolic tool (information overload and greenwashing policy) in contrast to the interests of stakeholders. Thus, researchers should connect other corporate governance variables with MCR, such as the connection between diversity and sustainable management compensation or multiple directorships to positively affect compensation reporting. Third, a linear relationship between OMAC and MCR is assumed, but there could be an inverted U-shaped relationship. Fourth, the German capital market is a classical representative of a two-tier system and a code law regime. The results of this study are not directly transferable to one-tier systems, case law regimes, and outsider models of corporate governance. Thus, cross-country studies with both case law and code law systems can be useful to obtain more knowledge about country-related governance aspects. Finally, the use of readability scores is subject to some limitations that could also decrease the validity of results (Li, 2008). Other research methods on this topic, such as the content analysis of compensation reports and scoring methods, can also be used.

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The Role of Organizational Cynicism and Conscientiousness in the Relationship between Ethical Leadership and Deviance

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Abstract: This study examines the influential role that organizational cynicism plays in understanding the relationship between ethical leadership and deviant work behavior. Scant research has addressed leadership or personality traits in determining organizational cynicism and its relationship to important outcomes such as deviant work behavior. An interactive effect of ethical leadership and conscientiousness is examined to determine if conscientious individuals are more or less prone to become organizational cynics based on the presence or absence of ethical leadership. The results suggest that conscientious individuals are less likely to rely on ethical leadership to prevent organizational cynicism and subsequent deviant behaviors. Conversely, individuals with lower levels of conscientiousness are more sensitive to ethical leadership and are more likely to respond as cynics, and with subsequent deviant behaviors. That is, individuals with higher levels of conscientiousness do not need ethical role models to prevent cynicism and deviant behaviors nearly as much as those who have lower levels of conscientiousness. The results provide important insights into how, and when, ethical leadership affects deviant workplace behavior.
Keywords: organizational cynicism, ethical leadership, workplace deviance

> As the employees filed into the meeting room, they awaited the Vice
> President of their division to announce the reason for the meeting.
> "We are here today to discuss the results of the employee engagement
> survey," he states. "As you know, our results were poor again this year.
> The leadership team for the company wants to know why. My
> perspective is that you are free to leave at any time if you are unhappy.
> No one is forcing you to work here. You know where the door is." The
> following year only a few employees filled out the engagement survey;
> they reasoned that it was not worth the time if management was not
> going to take it seriously to improve their leadership.

As demonstrated in the above vignette, suspicion, mistrust, and negative
expectations can arise from the behavior of organizational leaders, potentially leading
to cynical attitudes and dysfunctional behaviors. Unfortunately, two-thirds of adults are
reported to believe corruption in business is widespread (Khoury and Crabtree, 2019).
In the United States, the cynical belief that organizations and organizational leaders are
principally self-serving rose in recent years with polls showing only about half of
respondents trusting business institutions (Edelman, 2018). These trends are worrisome
as employee cynicism is often associated with negative outcomes such as intentions to
quit, poor job performance (Chiaburu *et al.*, 2013), and deviant behavior (Evans *et al.*,
2011). Despite its prevalence and implications, a comprehensive knowledge of employee
cynicism is lacking, and there is a need to examine its causes and consequences
(Chiaburu *et al.*, 2013; James and Shaw, 2016; Scott and Zweig, 2016).

Organizational cynicism is an attitude distinguished by the belief that one's
employer, including its procedures and management, lacks integrity and is self-serving
with little to no concern for its employees (Dean *et al.*, 1998; Wilkerson, 2002). Research
finds that contextual aspects of the work environment are strong predictors of
organizational cynicism (Chiaburu *et al.,* 2013). Positive aspects (e.g., supportive
management and fair treatment) reduce cynicism while negative aspects (e.g., broken
promises and self-interested management) are associated with increased levels of
cynicism. These antecedents, while informative, focus mostly on organizational policies
and practices to alleviate cynicism among the ranks of employees. Research is needed
that moves beyond the symptoms of various policies and practices to the essential
problem: the persons who make those determinations and manage the employees.
Although limited, research in the field of education indicates that organizational
cynicism can be mitigated by leadership approaches, including leader-member
exchanges (Gkorezis *et al.*, 2014), democratic leadership (Terzi and Derin, 2016), and
ethical leadership (Mete, 2013).

The present study empirically tests ethical leadership as an antecedent of
organizational cynicism and the subsequent deviance that results from cynicism (see
Figure I). Ethical leadership embodies the policies, practices, and institutionalized
norms often associated with organizational cynicism. Ethical leadership is "the
demonstration of ethically appropriate conduct through personal actions and
interpersonal relationships, and the promotion of such conduct to followers through
two-way communication, reinforcement, and decision-making" (Brown *et al.*, 2005: 120).
Ethical leadership likely encompasses many of the antecedents of organizational
cynicism as research indicates employees often feel supported and valued by ethical

managers (Bedi *et al.*, 2016; Loi *et al.*, 2015). Thus, organizations with ethical leadership are less likely to be plagued by perceptions of management duplicity and self-interests.

This study also examines conscientiousness as a moderator of the ethical leadership-organizational cynicism relationship. Conscientious individuals are goal-oriented, dependable, hardworking, and persistent, and these characteristics determine how individuals experience, decipher, and react to their environment (Roberts *et al.*, 2009). Persons high in conscientiousness are typically confident in their own abilities and less sensitive to contextual elements (Roberts *et al.*, 2009; Gerhardt *et al.*, 2007). Individuals are therefore likely to respond differently to ethical leadership depending on their own level of conscientiousness.

Figure I
Hypothesized Model
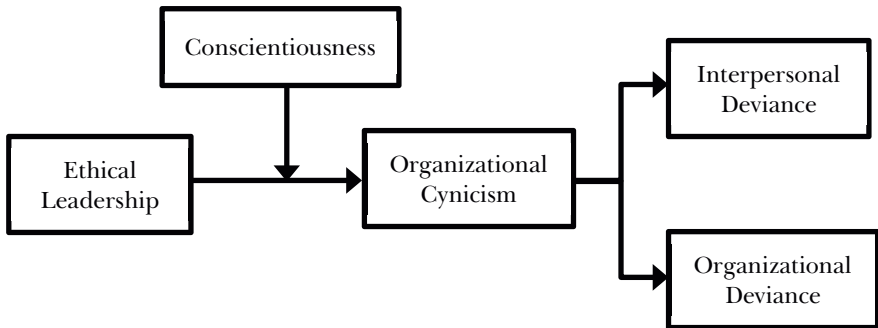
This study contributes to understanding ethical leadership and organizational cynicism more fully. First, in response to calls for research examining mediated models (Ng and Feldman, 2015; Chiaburu *et al.*, 2013), organizational cynicism is proposed as a mediator of the ethical leadership–deviance relationship. Ethical leadership studies often neglect indirect models that examine how employees process and react to ethical leadership (Ng and Feldman, 2015); similarly, Chiaburu *et al.* (2013) contend organizational cynicism research needs more robust empirical models. Since people generally respond to their evaluations of workplace events rather than the events directly (Eagly and Chaiken, 1993), organizational cynicism can function as a clarifying lens to illuminate the process by which ethical leadership affects employee attitudes and workplace behavior.

Second, the present study incorporates an important individual difference variable into the understanding of ethical leadership and its relationship to workplace deviance. Situational factors dominate studies of organizational cynicism, but there is a need to examine which persons might be more prone to cynicism (Scott and Zweig, 2016). Leadership research also has a history of discounting individual attributes (Uhl-Bien *et al.*, 2014) though personal attributes, such as equity sensitivity, can produce differential reactions to ethical leadership (Evans *et al.*, 2016). Individual differences frame how workplace events are perceived and understood (Roberts *et al.*, 2009); therefore, it is

proposed that ethical leadership and conscientiousness interact to affect organizational cynicism, which in turn influences employee deviance behaviors.

THEORETICAL DEVELOPMENT

Organizational cynicism is a negative attitude toward one's employing organization; as such, is comprised of the belief that one's employer lacks integrity, negative emotional reactions toward the organization, and behavioral tendencies consistent with these beliefs and feelings (Dean *et al*., 1998). Cynicism typically arises when employees believe the organization, its management, procedures, and processes are operating in a manner counter to the interests of employees (Wilkerson, 2002). Managers are often viewed as organizational agents (Levinson, 1965) who can have a powerful influence on employee feelings and beliefs about one's employer (Brown *et al*., 2005; Dean *et al*., 1998). Research demonstrates the employee-manager interactions can be negative workplace experiences (e.g., unmet expectations) that cause higher employee cynicism, or positive experiences (e.g., fair treatment) that diminish cynicism (Chiaburu *et al*., 2013).

Since ethical leaders promote feelings of trust in management and more positive feelings toward the organization (Bedi *et al.*, 2016), experiencing ethical leadership will likely minimize cynical beliefs about one's employer. The effects of ethical leadership are often examined through the lenses of social learning theory and social exchange theory (Hansen *et al*., 2013; Ng and Feldman, 2015). Social learning theory (Bandura, 1986) suggests individuals learn from each other via observation, imitation, and modeling. Learning often occurs by vicarious experience—by observing others' actions and the corresponding consequences. Employees look to organizational leaders as role models to determine their attitudes and behaviors toward many aspects of organizational life including ethical values (Brown *et al.*, 2005).

Social exchange theory describes relationships in terms of a series of interdependent interactions that produce obligations toward one another (Cropanzano and Mitchell, 2005). A common theme in social exchange theory research is that reciprocity is rooted in quid pro quo tendencies. Specifically, unlike economic exchanges that are more contractual in nature, high quality social exchanges generate greater reciprocity through trust, obligation, and gratitude (Blau, 1964; Brown and Trevino, 2006). When employees receive favorable (or unfavorable) treatment, they in turn feel an obligation to reciprocate favorable (or unfavorable) treatment in some kind. Because of the fair and consistent treatment they receive, followers of ethical leaders are more likely to believe they are in a social exchange relationship (Hansen *et al*., 2013).

Ethical Leadership

Ethical leaders are described as being moral people and moral managers in both their personal and professional lives that instill and reinforce similar values in their followers (Brown *et al.*, 2005; Brown and Trevino, 2006). Moral people act fairly, honestly, and with concern for others in their interpersonal relationships. Moral managers treat followers justly and fairly, which increases the quality of subordinate-follower relationships (Hansen *et al.*, 2013) and thus, ethical leaders are likely to be viewed favorably by followers. Ethical leaders also "practice what they preach" (Brown and Trevino, 2006), which enhances role model credibility and attractiveness. Ethical leaders personally exhibit virtuous behaviors via their own actions, which aligns with

their communications and managerial efforts toward employees. Behavioral integrity, which is the alignment of the words and deeds of managers, is positively related to employee satisfaction with leadership and with favorable attitudes toward an organization (Davis and Rothstein, 2006).

Ethical leaders, as conceptualized by Brown *et al.* (2005), construct employee-employer relationships that adhere to many principles of organizational justice. Ethical leaders act with integrity; they treat followers in a fair, bias-free manner that produces perceptions of leader honesty and favorable views of the organization (Bedi *et al.*, 2016). The consideration style of ethical leaders reflects interactional justice (respectful, truthful), procedural justice (unbiased, consistent), and distributive justice (equitable, fair) (Brown and Trevino, 2006; Xu *et al.*, 2016). Meta-analysis results from Chiaburu *et al.* (2013) revealed all three types of justice have a negative relationship with organizational cynicism. Conversely, unjust treatments, processes, or outcomes are associated with employees having negative feelings and views toward the organization (Colquittt *et al.*, 2013).

Ethical leadership is thus more likely to result in constructive interactive employee-employer relationships (Bedi *et al.*, 2016) that reflect positive socio-emotional attributes such as trust and respect versus low quality employee-employer relationships characterized by suspicion and malice (Cropanzano and Mitchell, 2005; Xu *et al.*, 2016). Indeed, ethical leadership has strong positive association with employee trust of management (Bedi *et al.*, 2016; Ng and Feldman, 2015). Organizational cynics, on the other hand, believe employers lack integrity, and cynics have a negative expectancy about the future (Wilkerson *et al.*, 2008). Cynics believe that negative and disappointing experiences will continue in future. Trust and cynicism are opposing beliefs and negatively related: trust emphasizes credibility of one's actions while cynicism implies a lack of trustworthiness (Chiaburu *et al.*, 2013). Since trust and organizational cynicism are negatively related, the relationship between ethical leadership and trust provides a compelling inference that ethical leadership will be negatively related to organizational cynicism.

In sum, ethical leadership provides a positive employee-employer experience for employees, which reduces disapproving evaluations of one's employer. Rather than focusing on the policies and practices, this study incorporates the source: the people who make and enact those decisions. Therefore, the first hypothesis is that:

Hypothesis 1: Ethical leadership is negatively related to organizational cynicism.

Individuals tend to respond to their organizational environment in ways that are consistent with their attitudes toward the organization (Eagly and Chaiken, 1993); hence, employees are likely to express organizational cynicism with negative behavioral responses. The model proposed here treats organizational cynicism as a mediator of the ethical leadership–workplace deviance relationship. Workplace deviance is "voluntary behavior that violates significant organizational norms and in doing so, threatens the well-being of the organization or its members, or both" (Bennett and Robinson, 2000: 349). Workplace deviance can be classified according to the target of the perpetrator's actions. Organizational deviance includes intentionally harmful behaviors directed toward the organization, and interpersonal deviance includes intentionally harmful behaviors directed toward other organizational members.

Deviance typically results from provocations in the workplace such as feeling mistreated, unsupported, or subject to unfair decisions (Colbert *et al.*, 2004; Robinson and Bennett, 1997). The causes underlying deviance are similar to the feelings and beliefs of organizational cynicism. Cynics believe their employers are unscrupulous, lack integrity, and accordingly, cynics feel strong negative emotions such as contempt and anger toward their employing organization (Dean *et al.*, 1998). When employees experience disparity or feel outrage at their situation, they often become motivated to restore balance, improve their circumstances, or vent their frustrations (Robinson and Bennett, 1997). Ethical leadership though is a positive experience, which is likely to reduce disapproving evaluations of one's employer, which should decrease the likelihood of engaging in intentionally harmful behavior. Hence, it is anticipated that:

> *Hypothesis 2: Organizational cynicism mediates the negative relationship between ethical leadership and (a) organizational deviance and (b) interpersonal deviance.*

Personality

Conscientiousness is likely to influence the ethical leadership–organizational cynicism relationship for at least three reasons. First, highly conscientious persons exhibit a higher tendency to utilize self-management practices, including planning to achieve goals and personal motivation (Gerhardt *et al.*, 2007). Self-management entails not only motivation, but also self and situational awareness that support one's own purposeful efforts to achieve goals. Second, conscientiousness is associated with generalized self-efficacy at work (Burke *et al.*, 2006) with a number of studies indicating conscientiousness is related to an overall belief in one's ability to successfully complete work tasks (Roberts *et al.*, 2009). Moreover, conscientiousness is negatively associated with perceived situational constraints (Gerhardt *et al.*, 2007). Conscientious persons will likely respond to challenging situations with more planning and persistence in order to achieve their goals. Third, conscientiousness is associated with experiencing positive affect and more satisfaction with life and work (Heller *et al.*, 2004). Persons with higher levels of conscientiousness are more likely to engage in positive coping actions (i.e., problem-focused planning and action). As these findings suggest, persons with higher levels of conscientiousness are industrious self-managers and thus should be less sensitive to the effect of ethical leadership.

Consistent with the person-situation interactionist paradigm, respondents should have nuanced responses to ethical leadership based on their degree of conscientiousness. More specifically, persons with low levels of conscientiousness are more likely to respond favorably to ethical leadership exhibited by their managers, since low conscientiousness persons are typically more susceptible to situational circumstances. Persons low in conscientiousness are more likely to look to their supervisors for cues for managing their circumstances and as a source of satisfaction. In addition, since low conscientiousness persons typically experience more negative feelings and beliefs, they are more likely to feel contempt and resentment toward their employer when ethical leadership is low, and thus they will engage in higher levels of workplace deviance. Hence, conscientiousness should moderate the effect of ethical leadership such that:

Hypothesis 3a: Conscientiousness moderates the indirect negative relationship between ethical leadership and organizational deviance through organizational cynicism. For persons with lower (higher) levels of conscientiousness, there will be a stronger (weaker) negative indirect effect of ethical leadership on organizational deviance through organizational cynicism.

Hypothesis 3b: Conscientiousness moderates the indirect negative relationship between ethical leadership and interpersonal deviance through organizational cynicism. For persons with lower (higher) levels of conscientiousness, there will be a stronger (weaker) negative indirect effect of ethical leadership on interpersonal deviance through organizational cynicism.

METHOD

Participants and Data Collection

Working adults enrolled as graduate-level students at a metropolitan university in the United States were solicited to participate in an online survey in exchange for nominal extra credit. Participation was voluntary and responses were confidential. From a possible 359 subjects, 332 surveys were recorded online. Fifty-five surveys were missing entire sections of data and thus discarded, which resulted in a sample of 277 working adults. Median age was 27.1 years (SD = 6.1) with average work experience of 8.1 years (SD = 6.0). Subjects were mostly male (53.4%) and 24.2% reported having managerial/supervisory experience. The majority of the subjects identified as Caucasian (79.1%), followed by Black (7.9%), and then Asian (6.1%).

Measures

Constructs were measured with established instruments and respondents answered using a five-point Likert-type scale unless otherwise noted. Scale responses ranged from 1 (strongly disagree) to 5 (strongly agree).

Ethical leadership. Employees responded to ten questions regarding the extent to which their supervisor engaged in behaviors consistent with ethical leadership (Brown *et al.*, 2005). Sample items include "makes fair and balanced decisions" and "discusses business ethics or values with employees" ($\alpha = 0.94$).

Organizational cynicism. This attitude was measured with the Wilkerson *et al.* (2008) seven-item instrument. Employees were asked to think about their employing organization when responding to each of the items. Sample items include "Company management is more interested in its goals and needs than in its employees' welfare" and "Overall, I expect more success than disappointment in working with this company" (reverse scored) ($\alpha = 0.88$).

Conscientiousness. The International Personality Item Pool (IPIP) scale (Goldberg *et al.*, 2006) for conscientiousness from Costa and McCrae (1992) was used to assess the extent to which respondents engaged in behaviors representative of trait conscientiousness. Sample items for this ten-item scale include, "Am always prepared" and "Make plans and stick to them" ($\alpha = 0.83$).

Workplace deviance. Employee deviance was measured with scales developed by Bennett and Robinson (2000) that differentiate deviance directed at the organization and deviance directed toward coworkers. Sample items from the twelve-item

organizational deviance scale include "Taken property without permission" and "Intentionally worked slower than you could have worked" (α = 0.76). Sample items from the seven-item interpersonal deviance scale include "Said something hurtful to someone at work" and "Cursed someone at work" (α = 0.83).

   Social desirability responding (SDR). Social desirability responding (SDR) was a control variable to limit potential bias associated with dependent variables (workplace deviance) that are less socially acceptable or desirable. SDR was measured with the thirteen-item True/False scale developed by Reynolds (1982). Sample items include "I am always courteous, even to people who are disagreeable" and "No matter who I am talking to, I am always a good listener" (α = 0.66).

RESULTS

   Table 1 reports descriptive statistics, zero-order correlations, and reliability coefficients. As expected, ethical leadership was negatively correlated with organizational cynicism (r = -0.65, $p < 0.01$), and organizational cynicism was positively correlated with organizational deviance (r = 0.25, $p < 0.01$) and interpersonal deviance (r = 0.19, $p < 0.01$).

   MPlus 8.1 (Muthén and Muthén, 1998-2017) was used to estimate the model parameters for the confirmatory factor analyses (CFAs). The weighted least squares mean and variance (WLSMV) estimator was used for all models. For the purposes of latent variable scaling and model identification, each latent factor variance was fixed at one. Table 2 includes the different models tested ranging from a one-factor to a six-factor model with chi-square difference testing. Of the six models, the hypothesized six-factor model exhibited the best fit ($\chi2$ = 2298.80, df = 1637, CFI = 0.95, TLI = 0.95, RMSEA = 0.04, SRMR = 0.09).

Table 1
Means, Standard Deviations and Cronbach Alpha Reliabilities

	Mean	SD	1	2	3	4	5	6
SDR	8.46	2.62	(0.66)					
Ethical Leadership	3.95	0.82	0.19**	(0.94)				
Organizational Cynicism	2.50	0.77	-0.17**	-0.65**	(0.88)			
Conscientiousness	4.06	0.52	0.29**	0.19**	-0.18**	(0.83)		
Organizational Deviance	1.55	0.39	-0.43**	-0.18**	0.25**	-0.57**	(0.75)	
Interpersonal Deviance	1.48	0.55	-0.36**	-0.15*	0.19**	-0.21**	0.43**	(0.83)

Notes: SDR = social desirability responding; ** = $p < 0.01$. Cronbach Alpha reliability values are shown on the diagonal.

Table 2
Measurement Model Assessment

Models	χ^2	df	$\Delta\chi^2$, Δdf[1]	CFI	TLI	RMSEA	SRMR
Model 1: One-factor model	5071.16**	1652		0.73	0.72	0.09	0.15
Model 2: Two-factor model (Deviance, cynicism, and social desirability created as its own factor.)	4490.96**	1651	166.27, 1**	0.77	0.76	0.08	0.15
Model 3: Three-factor model (Conscientiousness as own factor.)	3618.55***	1649	196.58, 2**	0.84	0.84	0.07	0.13
Model 4: Four-factor model (Social desirability as its own factor.)	3554.16**	1646	31.51, 3**	0.85	0.84	0.07	0.13
Model 5: Five-factor model (Cynicism as its own factor.)	2469.98**	1642	221.95, 4**	0.93	0.93	0.04	0.10
Model 6: Six-factor model (Hypothesized model)	2298.80**	1637	69.25, 5**	0.95	0.95	0.04	0.09

CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean error of approximation; SRMR = standardized root mean squared residual; * $p > 0.05$; **$p > 0.01$

Hypotheses were tested using SPSS version 23 along with the PROCESS version 3 macro developed by Hayes (2018). Hierarchical multiple regression and conditional process modeling are tools to analyze direct effects, indirect effects, and conditional indirect effects. Table 3, Model 1 reports the regression results for Hypothesis 1. The control variable of SDR was entered in step 1 and the predictor in step 2. Results support a negative relationship between ethical leadership and organizational cynicism (B = -0.60, t = -13.30, p < 0.01). Hypothesis 2a predicted organizational cynicism would mediate the relationship between ethical leadership and the outcomes of organizational deviance and interpersonal deviance. SDR was entered in step 1, ethical leadership was entered in step 2, and organizational cynicism was entered in step 3 (see Table 4). Hypothesis 2a was supported as the relationship between ethical leadership and organizational deviance was no longer significant when the mediator was entered (Baron and Kenney, 1986) while organizational cynicism had a significant effect on organizational deviance (B = 0.10, t = 2.86, p < 0.01). Mediation was also tested by the bootstrapping resampling method that creates an empirical representation of the indirect effect with the distribution of results used to create a confidence interval (CI) (Hayes, 2018). Based on the bias corrected method with 5,000 estimates, the indirect effect is supported (estimated effect = -0.06, CI [-0.11, -0.02]). Regression results did not support Hypothesis 2b, which predicted a mediated effect for the outcome of interpersonal deviance. The CI around the regression coefficient for organizational cynicism (B = 0.09, t = 1.67, p < 0.10) includes zero, and the indirect effect estimate also has zero in the CI (estimated effect = -0.05, CI [-0.11, 0.00]).

Table 3
Regression Results for Organizational Cynicism as Dependent Variable

	Organizational Cynicism			
	Model 1		Model 2	
	B	95% C.I.	B	95% C.I.
Constant	5.21 **	[4.61, 5.80]	8.67 **	[6.21, 11.13]
SDR	-0.01	[-0.04, 0.02]	-0.01	[-0.04, 0.02]
Ethical Leadership	-0.60 **	[-0.69, -0.51]	-1.49 **	[-2.11, -0.87]
Conscientiousness	-0.07	[0.90, 1.11]	-0.91 **	[-1.52, -0.31]
Ethical Leadership * Conscientiousness			0.22 **	[0.07, 0.37]
R^2	0.42 **		0.44 **	
$R^2 \Delta$	0.39 **		0.02 **	

** = p < 0.01

Table 4
Regression Results for Mediation Analysis

Organizational Deviance

	Model 1		Model 2	
	B	95% C.I.	B	95% C.I.
Constant	2.45**	[2.01, 2.47]	1.74**	[1.32, 2.15]
SDR	-0.06**	[-0.08, -0.04]	-0.06**	[-0.08, -0.04]
Ethical Leadership	-0.05 ł	[-0.10, 0.00]	-0.05**	[-0.05, 0.08]
Organizational Cynicism			0.10**	[0.03, 0.27]
R^2	0.19**		0.21**	
$R^2 \Delta$	0.01 ł		0.02**	

Interpersonal Deviance

	Model 1		Model 2	
	B	95% C.I.	B	95% C.I.
Constant	2.33**	[2.00, 2.67]	1.89**	[1.27, 2.15]
SDR	-0.07**	[-0.10, -0.05]	-0.07**	[-0.10, -0.05]
Ethical Leadership	-0.06	[-0.14, 0.02]	-0.01	[-0.10, 0.09]
Organizational Cynicism			0.09 ł	[-0.02, 0.19]
R^2	0.14**		0.15**	
$R^2 \Delta$	0.01		0.01 ł	

** = $p < 0.01$; ł = p < 0.10

Hypothesis 3 concerned the conditional indirect effect of the ethical leadership-conscientiousness interaction through the mediator of organizational cynicism. Hypothesis 3a predicted a conditional indirect effect on the outcome of organizational deviance. Table 3, Model 2 shows organizational cynicism regressed on the interaction term, which was significant (B = 0.22, t = 2.86, p < 0.01). Figure II shows a graph of the interaction with organizational cynicism plotted at +/- one standard deviation. Results from simple slope analysis revealed that, for those persons low in conscientiousness, the negative relationship between ethical leadership and organizational cynicism was significant (simple slope = -0.72, t = -2.24, p < 0 .05). However, for those persons high in conscientiousness, the relationship between ethical leadership and organizational cynicism was not significant (simple slope = -0.49, t = -1.52, n.s.). Table 5 reports results from the PROCESS analysis of the mediated relationship between ethical leadership and the two types of workplace deviance at different levels of conscientiousness. Bootstrapping resampling was again used to estimate the moderated mediation effect. Hypothesis 3a predicted conscientiousness would moderate the indirect negative relationship between ethical leadership and

organizational deviance through organizational cynicism. Hypothesis 3a was supported as the strongest mediated effect was for persons with lower levels of conscientiousness (estimated effect = -0.07, CI [-0.13, -0.21]). Hypothesis 3b that predicted a moderated mediation effect for the outcome of interpersonal deviance was not supported. The CI for each estimated effect includes zero, as did the regression coefficient previously reported.

Figure II
Interaction Results
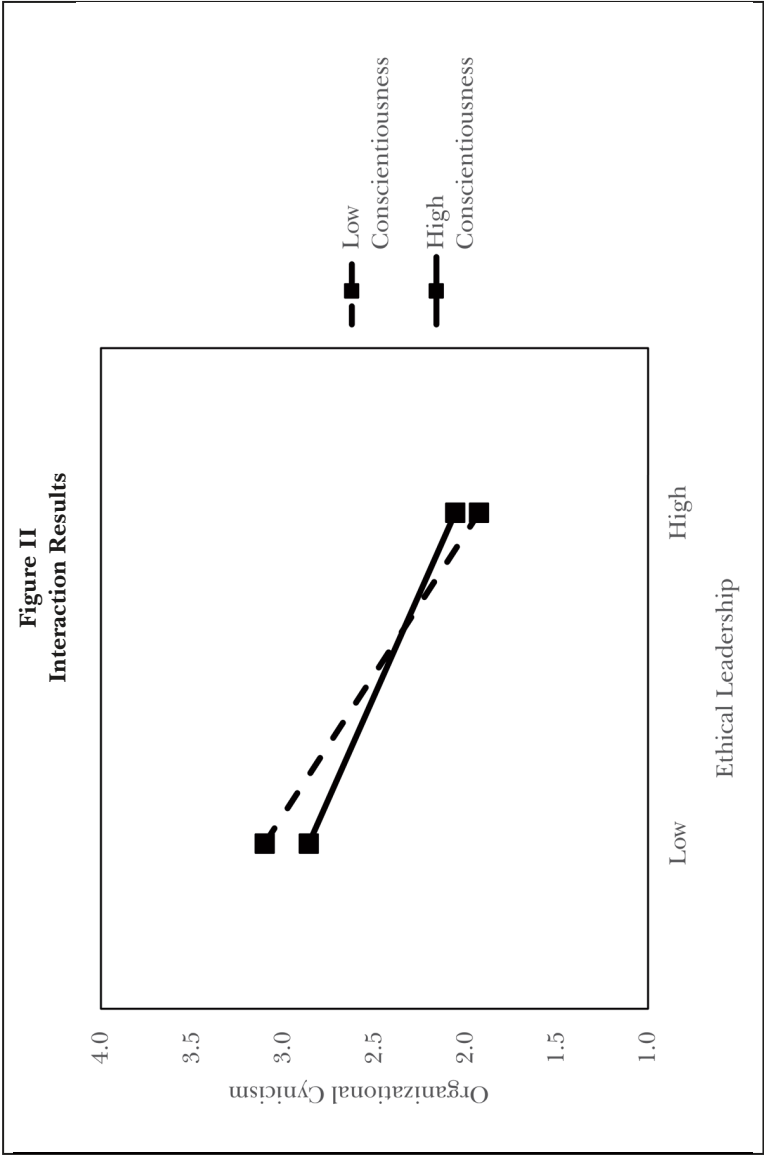
Table 5
Conditional Indirect Effects

Ethical Leadership –> Organizational Cynicism –> Organizational Deviance					
Conditional Values	Conscien-tiousness	Effect	SE	Lower Bound	Upper Bound
-1 SD Conscientiousness	3.54	-0.07	0.03	-0.13	-0.21
Mean Conscientiousness	4.06	-0.06	0.02	-0.11	-0.02
+1 SD Conscientiousness	4.58	-0.05	0.02	-0.09	-0.01
Ethical Leadership –> Organizational Cynicism –> Interpersonal Deviance					
Conditional Values	Conscien-tiousness	Estimate	SE	Lower Bound	Upper Bound
-1 SD Conscientiousness	3.54	-0.06	0.03	-0.13	0.00
Mean Conscientiousness	4.06	-0.05	0.03	-0.11	0.00
+1 SD Conscientiousness	4.58	-0.04	0.02	-0.09	0.00

Lower and upper bounds are 95% bias-corrected confidence intervals

DISCUSSION

Investigating the relationships among ethical leadership, conscientiousness, organizational cynicism, and workplace deviance provides new insights for further understanding the processes by which ethical leadership affects employees (Ng and Feldman, 2015) and second, how organizational cynicism develops (Scott and Zweig, 2016). Examining ethical leadership as an antecedent of organizational cynicism moves research beyond symptoms of organizational policies and practices to the underlying cause: the people who make and enact those decisions. In doing so, the findings demonstrate that the character and leadership of the individuals who execute policies and practices may be just as important as the policies / practices themselves. This study also demonstrates the power of individual differences—specifically conscientiousness—as potential buffers in the formation of attitudes and subsequent behaviors.

Findings indicate organizational cynicism mediates the relationship between ethical leadership and organizationally targeted deviance. Furthermore, persons low in the trait of conscientiousness reacted more strongly to the lack (or presence) of ethical leadership than persons with higher levels of conscientiousness. While ethical leadership was negatively related to organizational cynicism, persons with lower levels of conscientiousness reported higher levels of organizational cynicism when ethical leadership was low. When ethical leadership was high, persons low in conscientiousness reported lower levels of organizational cynicism. Persons may differentially react to ethical leadership and thus, develop different degrees of organizational cynicism, which then influences one's degree of organizational deviance.

The results also indicate that ethical leadership has an impact on organizational deviance, but not on interpersonal deviance. This is important for understanding organizational cynicism. This form of cynicism is not a broadly focused attitude, nor is it an artifact of persons who are cynical in nature. Rather, it is an attitude focused specifically on the organization and its managers, and the behavioral impacts of this

form of cynicism appear concentrated on the organization and its managers. This provides further evidence that the leadership behaviors of an organization's managers actually matter.

Theoretical and Future Research Implications

These findings can be interpreted in the context of calls for a person-situation framework of organizational cynicism (Chiaburu *et al.*, 2013; Scott and Zweig, 2016). Attitudes generally have both dispositional and experiential roots (Heller *et al.*, 2004; Eagly and Chaiken, 1993); yet organizational cynicism research has largely overlooked how personal predilections and tendencies affect how contextual issues are internalized. Some individuals may be acutely sensitive to organizational events, while others may be less responsive to contextual events. Individuals who have a cynical attitude toward their employers often suffer negative personal consequences, such as lower job satisfaction and lower levels of performance (Chiaburu *et al.*, 2013). The current findings reinforce the notion that unethical leadership, and the resulting organizational cynicism, leads to negative outcomes not only for individuals, but for the organization as a whole.

The mediated model tested in this study also contributes to the ethical leadership literature. In particular, there remains a need to examine the process by which ethical leadership impacts employee outcomes such as behavior and decision-making (Ng and Feldman, 2015). The current findings point to organizational cynicism as an important part of this process. Organizational cynicism represents an evaluation of one's employing organization as to current and future events (Dean *et al.*, 1998; Wilkerson, 2002) and thus, this attitude provides perspective as to how an employee thinks, feels, and may respond based on the degree of ethical leadership exhibited by their managers. Managers are often seen by employees as having power and prominence, and thus can be instrumental forces on the perceptions of followers (Bandura, 1986; Levinson, 1965). The current results indicate that ethical leaders can reduce negative employee evaluations and reduce the likelihood of organizationally targeted deviance.

Another contribution of this study is revealing that conscientiousness influences the development of organizational cynicism in response to ethical leadership. Those high in conscientiousness appear less susceptible to the negative impacts of unethical leadership. This is consistent with research on conscientiousness, which shows that persons high in conscientiousness engage in more self-management, are less influenced by situational factors (Gerhardt *et al.*, 2007), and have higher generalized self-efficacy (Burke *et al.*, 2006). However, low conscientious persons appear to need effective ethical leader interactions since they are more susceptible to and responsive to the work context. Since conscientious individuals are more capable of self-regulation of their thoughts, feelings, and behaviors (Roberts *et al.*, 2009), this trait may serve as a buffer against the influence of an unethical leader.

The non-significant findings for the outcome of interpersonal deviance are also informative. In general, deviant acts are in response to perceived injustices, threats to oneself, or mistreatment (Colbert *et al.*, 2004; Robinson and Bennett, 1997). Interpersonal deviance targets other members of the organization while organizational deviance focuses on the organization as a whole. Within this study, employees might be differentiating their responses to cynical attitudes according to the object of those attitudes. Employees with high levels of organizational cynicism are directing their frustration toward the primary object of their frustration–the organization. Cynical

employees may very well act out (i.e., cursing, making fun of) toward perceived agents of the organization (boss or managers) yet still treat fellow co-workers well. Similar results were found by James and Shaw (2016) who assessed cynicism stemming from coworkers, immediate supervisors, and upper-level management. Their study found that employees differentiated between specific types of individuals, and that employees were apparently sensitive to specific persons viewed as accountable for perceived psychological contract violations. Future research should continue with a finer grained examination of both the sources of employee cynicism and associated outcomes to elucidate the nomological network of organizational cynicism.

Future research should also continue to extend the person-situation framework of organizational cynicism. While organizational cynicism is often seen as an attitude with negative consequences, it may also serve as a coping mechanism for persons in a challenging, unethical environment. Persons exposed to unethical leadership likely have few prospects for actually changing their leaders' behavior. However, a "healthy" amount of cynicism may provide individuals with the psychological resources needed to cope with extenuating or challenging circumstances. Further, such healthy cynicism may keep individuals from falling prey to unethical leaders, who often have the power and persuasive capacity to compel followers into unethical behaviors. An interesting question to consider is whether higher levels of organization cynicism inoculates persons from the persuasive power of unethical leaders attempting to dupe their followers into behaviors they may regret. Since personality can affect employee-supervisor dynamics, other personality variables could also be examined. For instance, traits such as moral identity may be particularly relevant when experiencing pronounced levels of organizational cynicism. Moral identity, a person's self-conception of moral beliefs and ideals (Aquino and Reed, 2002), seems likely to function as a form of self-regulation to resist social pressures.

Practical Implications

Organizations concerned with the implications of a cynical workforce could (a) promote ethical leadership and/or (b) conscientiousness. First, organizations would benefit from actively promoting ethical leadership among their supervisors. However, effective ethics training can be elusive. Results from a recent Gallup poll found less than half those persons completing ethics training learned something to apply in their day-to-day work, and only one-third of those persons thought the training had an effect on their coworkers (Khoury and Crabtree, 2019). More effective ethical leadership programs include an overarching organizational ethical infrastructure (e.g., communication, control, and accountability systems) and in addition, train participants to be aware of the self-deception pitfall of not honestly recognizing one's actions (Tenbrunsel and Messick, 2004).

When implementing ethical leadership initiatives, managers should: (1) recognize employee perceptions of fairness are paramount, (2) beware of bounded ethicality (Bazerman and Moore, 2012), and (3) consider contrarian viewpoints of one's managerial assertions as favored positions may be plagued with hubris (Heath and Heath, 2013). First, managers must contemplate how employees perceive situational constraints. Leaders are choice architects and their frame, options presented (or not presented), and the order of the options presented can guide employee attitudes and behaviors (Thaler and Sunstein, 2009). Second, bounded ethicality suggests that

managers may act in unethical ways unconsciously. For example, doing favors for other people perceived as similar (i.e., in-group favoritism) and unconsciously stereotyping others (i.e., implicit bias) can be harmful for individuals who are dissimilar; through self-reflection and accountability from others in the organization, managers can overcome these issues. Last, managers should allow employees to act as devil's advocates and actively disagree. This reduces hubris and managerial bias from impeding decisions. Having a participative process for decision-making is a primary aspect of ethical leadership (Brown *et al.*, 2005).

Organizations would also benefit from actively promoting conscientiousness throughout the employee ranks. These findings point to the need for attention to not just leaders but to the role of followers in ethical behavior. In this study, persons high in conscientiousness were less susceptible to the negative impacts of unethical leadership. This suggests that organizations faced with questions of ethical leadership among its supervisors and managers may want to intervene not only on the leaders, but also on the followers. To address this issue, organizations can (1) hire individuals higher in conscientiousness, and (2) train followers in behaviors and decision-making processes that promote thoughtful responses to leader behaviors.

Conscientiousness can be learned through activities that incorporate contingency management, mental contrasting, and cognitive remediation (Javaras *et al.*, 2019). With contingency management, positive changes in behavior are reinforced and rewarded. This is something that an organization can do quite easily for an employee. Mental contrasting involves imagining a goal, the path to the goal, and the obstacles that may arise. This may help managers proactively provide support and assistance for employees to reach goals. Cognitive remediation entails cognitive exercises and educational games to improve attention, working memory, and social cognition. Through these exercises, individuals may transfer these cognitive gains to other challenges and in daily life—specifically work-related tasks. Each of these processes provides tangible guidance for improving the conscientiousness of employees and managers.

Limitations

This study should be interpreted within its limitations. First, all measures were recorded via self-reporting, raising concerns that self-reports may be biased. However, the assumption of a universal biasing effect in mono-method designs is overstated (Spector, 2006). Furthermore, self-report methods are appropriate for assessing personal psychological states. The survey design also included instructions assuring respondents of anonymity, which can lessen response bias (Podsakoff *et al.*, 2003) particularly when asking about sensitive issues such as negative feelings or deviance. In addition, SDR tendency was a control variable to account for the possibility of subjects presenting themselves favorably (Podsakoff *et al.*, 2003). Another potential limitation is that subjects were recruited from a single university, potentially limiting the generalizability of the observed results. A third concern is that Cronbach alpha for SDR equaled 0.66, which is below the often cited, but not absolute, 0.70 threshold (Streiner, 2003). Cronbach alpha measures the interrelatedness of the scale items, and lower alpha values can indicate that some items are reflecting unique variance (Cortina, 1993). Measurement precision is thus a concern of this study, and all studies, because it can affect statistical validity and associated inferences about the relationships among variables.

Finally, cross-sectional designs do not account for temporal sequencing, which leaves open the possibility of reverse causality. The proposed directionality is however rooted in established theory and draws from other published studies. Deviant acts though could be the starting point for the attitude of organizational cynicism as past behaviors are sometimes used to rationalize attitudes (Salancik and Pfeffer, 1978). Deviant and cynical employees may function as social cues that lessens perceptions of ethical leadership. Overall, each of these limitations represents opportunities for future researchers to address through alternative designs.

Final Comments

The results of this study provide a better understanding of the causes and outcomes of organizational cynicism. The person-situation framework is particularly suited to advancing the understanding of how the complex relationships among ethical leadership, organizational cynicism, and individual personality can ultimately impact individual responses such as deviant behavior. While employee cynicism may be widespread in today's organizations, ongoing research on this important topic can continue to provide insights into solutions to this unfortunate phenomenon.

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Development of a Loss Aversion Scale

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Abstract: Although loss aversion has been shown to be a pervasive phenomenon in economics, business, and management, measuring individual loss aversion tendency has proven challenging because it requires complex and lengthy experiments and data collections. To address this, this study develops a seven-item loss aversion scale, which is simple and unidimensional. The study validates the scale by correlating it with two other decision-making tendency scales – risk aversion and risk propensity, and tests the predictive validity through two behavioral tendency statements (i.e., the sunk cost fallacy and the endowment effect) and four lottery games. The overall results suggest that the

scale is a reliable and valid instrument that can be used to assess an individual's loss aversion tendency in place of more complex behavioral experiments. The paper discusses the managerial implications of the scale in various business areas and suggests future research directions for further validating the scale.

Keywords: loss aversion, scale development, survey

Significant research in psychology, economics, business, and decision sciences has shown that loss aversion is a pervasive and important phenomenon worthy of consideration (e.g., Ariely *et al.*, 2005; Camerer, 2005; Kahneman and Tversky, 1979; Novemsky and Kahneman, 2005). Research has shown that human beings tend to be loss averse (Tom *et al.*, 2007) but the severity of an individual's aversion to loss is affected by his/her culture, decision situation, ownership of the focal product, and even personal mood and emotion (Brenner *et al.*, 2007; Harnick *et al.*, 2007; Lerner *et al.*, 2004; Sokol-Hessner *et al.*, 2009; Wang *et al.*, 2017; Zhang and Fishbach, 2005). While conceptually related to risk aversion, loss aversion is a distinct construct reflecting people's desire to reduce loss and to weigh loss more proportionally than gain, whereas risk aversion reflects a general preference for certainty rather than uncertainty (Kahneman and Tversky, 1979). As such, risk aversion highlights the tension of smaller, certain versus larger, uncertain returns.

Loss aversion helps to explain various anomalous human behaviors that deviate from rational utility theories. It has been used to explain the framing effect (Levin *et al.*, 1998; Tversky and Kahneman, 1981), the status quo bias (Kahneman *et al.*, 1991; Samuelson and Zeckhauser, 1988), the endowment effect (Kahneman *et al.*, 1991), the sunk cost fallacy (Arkes and Ayton, 1999), the attraction effect (Highhouse, 1996), the compromise effect (Tversky and Simonson, 1993), anticipated and experienced regret (Kardes, 1994), brand choice (Hardie *et al.*, 1993), and incumbency biases in elections (Quattrone and Tversky, 1988). Furthermore, research has repeatedly shown that loss aversion has a strong influence on individual and organizational decisions in business areas such as finance (Genesove and Mayer, 2001; Haigh and List, 2005; Odean, 1998), marketing (Tunçel and Hammitt, 2014), human resource management (Brooks *et al.*, 2012; Imas *et al.*, 2017), and supply chain management (Wang and Webster, 2007, 2009; Wang, 2010).

Currently, an individual's loss aversion is measured in one of two ways. The first way is to use the ratio of WTA (i.e., willingness to accept compensation to forgo a good) to WTP (i.e., willingness to pay for the same good) (Horowitz and McConnell, 2002; Sayman and Öncüler, 2005). The second is to use hypothesized lotteries (Abdellaoui *et al.*, 2007; Wang *et al.*, 2017). However, both methods are complex and take considerable time to complete.

The purpose of this study is to address these limitations by developing a simple, reliable, and universal scale that can be used to measure people's loss aversion tendency at the individual level in place of complex and time-consuming behavioral experiments. A further benefit is that the scale can be applied to various business and management decision scenarios. The theoretical background of the study is discussed in the next section. Then, the scale development process is explained and the data analyses and results are presented. Finally, the paper discusses the practical implications and the limitations of this study before suggesting directions for future research.

BACKGROUND OF THE STUDY

Loss Aversion

Loss aversion is an important concept in psychology, economics, business, and decision sciences. This concept was first identified by Kahneman and Tversky, who described loss aversion as "the aggravation that one experiences in losing a sum of money appears to be greater than the pleasure associated with gaining the same amount" (1979: 279). In other words, people would rather avoid a loss than acquire an equivalent gain, since the magnitude of pain from losing a certain amount of money is larger than the magnitude of happiness from gaining the same amount of money. While conceptually related to constructs such as risk aversion and risk propensity, loss aversion is a distinct construct reflecting people's desire to reduce losses and to weigh losses more heavily than they weigh proportional gains. Risk aversion and risk propensity, however, are different. These are personality traits that reflect people's decision tendency towards *risk*, which is a function of the uncertainty of the outcomes combined with the likelihood and perceived value of each possible outcome (e.g., March and Shapira, 1987; Sebora and Cornwall, 1995). Risk aversion reflects a general preference for certainty rather than uncertainty (Kahneman and Tversky, 1979) and highlights the tension between smaller certain returns and larger uncertain ones. Risk propensity, on the other hand, is an individual's tendency to take or avoid risk (Sitkin and Pablo, 1992; Sitkin and Weingart, 1995).

Although it is difficult to quantify the magnitude of pain and happiness from loss and gain respectively, research shows losses can be twice as powerful as gains (Kahneman and Tversky, 1992). Kahneman and Tversky's (1979) original study explained loss and gain in monetary terms; however, people's loss aversion tendency is not simply restricted to monetary losses. It has been shown that individuals are also averse to non-monetary forms of loss. Adversity to loss has been proven a relatively common and robust behavior tendency supported by a significant amount of research (e.g., Ariely *et al.*, 2005; Camerer, 2005; Novemsky and Kahneman, 2005). Recent studies into the neuro science of non-human primates (Chen *et al.*, 2006), young children (Harbaugh *et al.*, 2001), and adults (Tom *et al.*, 2007) suggest loss aversion may be deeply rooted in brains. From the human evolution perspective, this suggests humans may be hardwired to be loss averse – the loss of a day's food could cause death, while the gain of an extra day's food might not cause an extra day of life, unless the food can be easily stored. The hardwired nature of loss aversion means people need to make a conscious effort and learn how to overcome loss aversion's influence.

Research has also found that culture and environment affect economic behaviors and preferences (Apicella *et al.*, 2014; Henrich, 2000; Henrich *et al.*, 2001; Roth *et al.*, 1991; Wang *et al.*, 2017) and that loss aversion and its consequential effects can be situation- and domain-specific. For example, Strahilevitz and Loewenstein (1998) find that loss aversion for goods increases with duration of ownership. Research has also shown that loss aversion can be attenuated or even reversed in some conditions (Novemsky and Kahneman, 2005; Harnick *et al.*, 2007; Brenner *et al.*, 2007) and it can be moderated by personal mood and emotion (Lerner *et al.*, 2004; Sokol-Hessner *et al.*, 2009; Zhang and Fishbach, 2005).

Applications of Loss Aversion

Loss aversion is conceptually related to several human behaviors in economics, business, and everyday life that are inconsistent with classic expected utility theory, and it can be used to explain several behavioral phenomena such as the following.

The framing effect. When people make a decision on options, they are often affected by how the options are presented, i.e., as a loss or as a gain. This cognitive bias is called the framing effect. Tversky and Kahneman (1981) showed people tend to avoid risk when a positive frame is presented (e.g., lives saved) but take risks when a negative frame is presented (e.g., lives lost). A person's loss aversion tendency provides a reasonable explanation for this bias since a loss is more significant than a gain of an equivalent amount, a sure gain is preferred over a probabilistic gain, and a probabilistic loss is preferred over a sure loss. An application of the framing effect in marketing is to frame a transaction as a gain or a loss. For example, the price difference between cash and credit card purchases can be framed as either cash discounts or credit card surcharges. Since consumers are less willing to bear the cost of a surcharge than to forego a discount, it's better to frame the transaction negatively: if they do not pay cash (i.e., using a credit card), they have to pay an additional surcharge (Levin *et al.*, 1998).

The Status Quo Bias. The status quo bias refers to people's preference for maintaining the current state of affairs since any change from that status quo is perceived as a loss (Kahneman *et al.*, 1991). Status quo bias can also be explained by loss aversion since the potential losses of switching from the status quo are often weighed more heavily than are the potential gains (Samuelson and Zeckhauser, 1988). Therefore, people prefer not to switch away from the status quo. Evidence of status quo bias is abundant in business. For example, people tend to maintain their current retirement plan even if it is no longer the optimal choice (Kempf and Ruenzi, 2006). Other examples include consumers' unwillingness to switch brand names (Hardie *et al.*, 1993), firms' reluctance to cloud systems adoption (Fan *et al.*, 2015), and industrial buyers' tendency to stick to current suppliers (Wagner and Friedl, 2007).

The Endowment Effect. The endowment effect refers to the fact that people value more highly goods that they own than they do identical goods that they do not possess (Kahneman *et al.*, 1991). In other words, people are more likely to retain an object they own than to acquire that same object when they do not own it. This phenomenon can be convincingly explained by loss aversion theory – avoiding a loss makes a person happier than making a gain. This is why in marketing, trial periods are widely used by businesses because the assumption is that a buyer will value the good more after she uses the good and perceives that she owns it. However, the endowment effect may also suppress people's willingness to trade what they own. For example, in housing markets, a large gap between sellers' WTA and buyers' WTP can explain small transaction volumes and low market liquidity (Fisher *et al.*, 2003).

Sunk Cost Fallacy. A sunk cost is a cost that has already been incurred and cannot be recovered. Based on the rationality assumption defined by classical economics, individuals or organizations should not consider irreversible costs when they make a decision about their current options. The only factors decision-makers should consider are the incremental costs and benefits. However, people's actions are often influenced by sunk costs, and this phenomenon is called the sunk cost fallacy. A classic example of the sunk cost fallacy is the Concorde supersonic airplane project. Although Concorde's dim financial prospects were known long before the plane was completed, the British

and French governments still decided to continue funding the project because they had already invested a lot of money (Arkes and Ayton, 1999). This is why the sunk cost fallacy is sometimes called the Concorde effect. Loss aversion helps to explain why people stick with a doomed project. Loss averse people cannot let go of sunk costs and they always try to get their money's worth or amortize the psychological burden of the (irreversible) cost in a mental account (Thaler, 1980).

In addition to explaining the above effects, loss aversion can also help to explain phenomena such as the attraction effect (Highhouse, 1996), the compromise effect (Tversky and Simonson, 1993), anticipated and experienced regret (Kardes, 1994), brand choice (Hardie *et al.*, 1993), labor supply (Camerer *et al.*, 1997), the equity premium puzzle, organ donation decisions, and incumbency biases in elections (see Rick, 2011, for a review).

Loss Aversion and Decision-making in Business

Research has repeatedly shown that loss aversion can have a strong influence on individual and organizational decisions in various business areas. In finance, Genesove and Mayer (2001) show home sellers appear to have a strong aversion to selling their homes for less than the price they paid, and home sellers facing a nominal loss set asking prices higher than those set by sellers not facing nominal losses. Haigh and List (2005) show that in experimental tests, professional traders exhibit even more loss aversion than non-professional student subjects. By analyzing the trading records of 10,000 accounts, Odean (1998) shows investors have a tendency to hold losing investments too long and sell winning investments too soon, which is a vivid demonstration of investors' aversion to loss in the stock market. In marketing, Hardie *et al.* (1993) use scanner panel data for refrigerated orange juice purchases to show when making brand choice, consumers weigh losses from a reference point more than equivalent sized gains, which demonstrates significant loss aversion. Marketing research also consistently shows a seller's willingness-to-accept (WTA) price is systematically higher than a buyer's willingness-to-pay (WTP) price, which is a manifestation of loss aversion (see Tunçel and Hammitt, 2014, for a review). In human resource management, recent work on the design of employee incentive contracts shows presenting incentives in the form of loss contracts (i.e., employees could potentially lose bonuses) increases productivity relative to gain contracts (i.e., the same bonuses are presented as gains) (Brooks *et al.*, 2012; Fryer *et al.*, 2012; Hossain and List, 2012). Imas *et al.* (2017) show loss contracts not only make people work harder but are also preferred. In supply chain management, research has found loss aversion of newsvendors affects the order quantity (Schweitzer and Cachon, 2000; Wang and Webster, 2009; Wang, 2010). Wang and Webster (2007) find gain/loss sharing provision can mitigate the loss aversion effect, which coordinates the supply chain and decreases the supply chain's inventory level.

Research Direction of the Current Study

Since loss aversion has been shown to be an important factor in the human decision-making process and since individuals have been shown to have different levels of loss aversion, it is crucial to have a reliable and simple way to measure it at the individual level. Research has also shown that individuals often differ in the extent to which they are loss-averse and these individual differences are fairly stable across risky and riskless

contexts (Gächter *et al.*, 2007). Thus, it is possible to measure loss aversion at an individual level.

While most traditional quantitative studies use aggregate data to measure loss aversion based on different parametric assumptions about utility and probability weighting (see Abdellaoui *et al*., 2007: 1662, Table 1, for a review), more recent studies have examined loss aversion at the individual level (Brooks and Zank, 2005; Gächter *et al.*, 2007). To do this, researchers use different experiments or surveys to estimate some proxy to loss aversion. One common way is to use the ratio of willingness to accept compensation to forgo a good (WTA) to willingness to pay for the same good (WTP). Since most people are loss averse, WTA is normally much larger than WTP and the typical WTA/WTP ratio is around 2 (Horowitz and McConnell, 2002). However, the WTA/WTP disparity varies significantly from study to study. Research has shown the WTA/WTP disparity is affected by the types of good used (Horowitz and McConnell, 2002), experiment designs (Sayman and Öncüler, 2005), subjects' experiences valuing the good, and the duration and repetition of studies (Tunçel and Hammitt, 2014). Another way has been used to measure individual loss aversion is hypothesized lotteries (Abdellaoui *et al.*, 2007; Rabin, 2000; Schmidt and Traub, 2002; Wang *et al.*, 2017). The downside of using lottery experiments lies in the complexity of the experiment design and implementation. As well, the nature of the experiment (such as gain/loss/mixed lotteries, probabilities of winning/losing, and outcome sizes) affects the accuracy of the elicited loss aversion measures (see Brooks and Zank, 2005, for a review). Other research has tried to use advanced technology in neuroscience to analyze human beings' brains in order to determine people's loss aversion levels. For example, Tom *et al*. (2007) used neuroimaging to observe brain function regions (including the ventral striatum and prefrontal cortex) of loss aversion behaviors. However, such a technology is much too complicated and expensive to be applied in most business studies.

The above-mentioned shortcomings call for a simple and reliable scale that can be used to measure an individual's loss aversion tendency. However, there does not exist such a scale currently. Thus, this study develops a simple scale that measures loss aversion and is applicable to various decision scenarios. This loss aversion scale is tested in this study to be reasonably reliable and unidimensional and is subsequently validated through its correlation with other conceptually-related constructs such as risk propensity and risk aversion. The loss aversion scale contributes to the loss aversion literature and can be used to further the understanding of the role of loss aversion in different business decisions. The next section describes the approach to scale development and testing.

LOSS AVERSION SCALE DEVELOPMENT AND TESTING

Item Generation

The operational definition of loss aversion in this study captures the original idea described by Kahneman and Tversky (1979), which says that a potential loss is perceived to be more harmful than a potential gain of the same magnitude is perceived to be pleasurable. Although Kahneman and Tversky (1979) focused mainly on the gain and loss of money, further research has shown that the phenomenon of loss aversion is not limited to monetary scenarios. Therefore, to develop the scale, the present study defines gain and loss in a much broader sense, including not only the psychological pain or pleasure of experiencing a loss or gain but also the psychological burden of even

thinking of a potential loss or gain (Carmon *et al.*, 2003). From here, eight items were developed based on the operational definition of loss aversion that extends beyond the monetary sense (see below). For example, Items 1, 2, 3, 4, and 8 focus on loss and gain without mentioning monetary values. Items 5 and 7 focus on failure and success, and Item 6 focuses on the length of time a loss/gain stays with a person rather than the magnitude of that loss/gain. When designing these items, special attention was paid to making sure that the items were measuring loss aversion rather than risk aversion and that these eight items are significantly distinct from established scales that measure risk aversion. For example, in Mandrik and Bao's (2005) six-item risk aversion scale (Table 4), they used words such as "taking chances," "foreseeable outcomes," "sure," "uncertain," and "new situation." This study avoided using any of these words that could imply risk or uncertainty to the respondents. All these eight items were measured on a seven-point scale (1 = strongly disagree, 7 = strongly agree).

1) When making a decision, I think much more about what might be lost than what might be gained.
2) The pain of losing money matters more than the pleasure of gaining the same amount of money.
3) I feel nervous when I have to make a decision that may lead to loss.
4) The pain from losing something matters much more to me than the pleasure from getting it.
5) Avoiding failure is less important to me than seeking success. (Reverse coding)
6) Experiencing a major loss stays in my mind longer than experiencing a major gain.
7) A potential failure scares me more than a potential success encourages me.
8) The suffering that comes with losses can be fully offset by the pleasure that comes from gains. (Reverse coding)

Data Collection

Subjects were recruited using Amazon's Mechanical Turk (MTurk), an online marketplace where people sign up to participate in tasks such as surveys and experiments and receive compensation for tasks approved by task requestors. MTurk has been used extensively in social science research (Huff and Tingley, 2015). Analyses of the MTurk participant pools find that subjects are more diverse than student samples or general online samples, and the data collected are equally reliable compared to a traditional method (Behrend *et al.*, 2011; Buhrmester *et al.*, 2011; Gosling *et al.*, 2004). The present study used several eligibility criteria, including "age above 18," "living in the USA," "having a LinkedIn account," "HIT approval rate ≥ 99%," and "Number of HITs approved > 50." The HIT approval rate is a "System Qualification," which is calculated by dividing the Worker's Lifetime Approved Assignments by the Worker's Lifetime Number of Assignments Submitted. This study used workers who had completed at least 50 tasks and whose lifetime approval rates were greater than or equal to 99%. Subjects first read the consent letter, and if eligible, continued to the survey and were compensated $4 for their participation. A national sample of 141 subjects completed the online survey.

The entire sample was divided into two sub-samples (71 and 70 subjects, respectively) for two reasons. First, using two separate sub-samples allows more rigorous

reliability and unidimensionality tests and increases the likelihood that the measurement scale possesses a high degree of generalizability (Hung and Tangpong, 2010). Second, dividing the sample into two based on participation time can compare these two sub-samples to test for the potential bias between early respondents and late respondents. The characteristics of the first sub-sample were (a) 38% male and 62% female, (b) 78.9% white and 21.1% non-white, (c) 95.8% age between 20 and 60 years old, and (d) 66.2% full-time employed, 22.5% part-time employed, and 11.3% not employed. The characteristics of the second sub-sample were (a) 27.1% male and 72.9% female, (b) 71.4% white and 28.6% non-white, (c) 94.2% age between 20 and 60 years old, and (d) 61.4% full-time employed, 18.6% part-time employed, and 20% not employed (See Table 1 for the detailed sample profiles).

Item Reduction and Unidimensionality Test

First, an exploratory factor analysis (EFA) was conducted using the first sub-sample. The initial results showed that Items 1, 2, 3, 4, 6, and 7 were loaded onto one component, and Items 5 and 8 were loaded onto another component. The variance extracted by the first component was 47.624%, whereas the variance extracted by the second component was 12.827%. Due to the poor loading of Item 5 (negative loading which contradicted the theoretical ground), this item was dropped and the EFA was re-run based on the remaining seven items. This time, the results showed that all seven items were loaded onto the same component, and the variance extracted by the component was increased to 51.157%. Both Kaiser-Mayer-Olkin (KMO) test (KMO value = 0.821) and Bartlett's test of sphericity ($\chi^2 = 166.961$; df = 21, p = 0.000) indicated the suitability of the data for factor analysis (see Table 2 for the EFA results).

Next, a confirmatory factor analysis (CFA) was conducted to estimate the measurement and to check for internal validity and reliability of the scale (Anderson and Gerbing, 1988). Normality tests were conducted before running the CFA. The skewness values of the variables in the first sub-sample ranged from -1.004 to 0.033, and the kurtosis values ranged from -1.219 to 0.635. In the second sub-sample, the skewness values ranged from -0.644 to 0.278, and the kurtosis values ranged from -0.786 to 0.450. In the combined sample, the skewness values ranged from -0.752 to 0.160, and the kurtosis values ranged from -0.894 to 0.573. All the evidence showed that the data do not violate the normality assumption.

Table 1
Sample Profile

Demographics	Sample 1 (N=71)		Sample 2 (N=70)		Combined Sample (N=141)	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Gender						
Male	27	38.0%	19	27.1%	46	32.6%
Female	44	62.0%	51	72.9%	95	67.4%
Age						
<20 years	1	1.4%	2	2.9%	3	2.1%
20-30 years	28	39.4%	35	50.0%	63	44.7%
31-40 years	26	36.6%	16	22.9%	42	29.8%
41-50 years	12	16.9%	10	14.3%	22	15.6%
51-60 years	2	2.8%	5	7.1%	7	5.0%
>60 years	2	2.8%	2	2.9%	4	2.8%
Ethnicity						
White (not of Hispanic or Latino origin)	56	78.9%	50	71.4%	106	75.2%
Black (African American)	4	5.6%	6	8.6%	10	7.1%
Asian or Pacific Islander	1	1.4%	2	2.9%	3	2.1%
Hispanic or Latino	4	5.6%	1	1.4%	5	3.5%
American Indian or Alaskan Native	0	0	1	1.4%	1	0.7%
Mixed	6	8.5%	9	12.9%	15	10.6%
Others	0	0	1	1.4%	1	0.7%
Full time vs. part time						
Full-time employed	47	66.2%	43	61.4%	90	63.83%
Part-time employed	16	22.5%	13	18.6%	29	20.57%
Not employed	8	11.3%	14	20.0%	22	15.60%

Table 2
Exploratory Factor Analysis
(Sample 1, N=71)

Items	EFA1	EFA2
Loss Aversion Item 1	0.739	0.741
Loss Aversion Item 2	0.709	0.692
Loss Aversion Item 3	0.672	0.694
Loss Aversion Item 4	0.777	0.785
Loss Aversion Item 5	-0.537	Removed
Loss Aversion Item 6	0.729	0.729
Loss Aversion Item 7	0.786	0.788
Loss Aversion Item 8 (Reverse)	0.519	0.551
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.825 (>0.70)	0.821 (>0.70)
Bartlett's Test of Sphericity	$\chi^2=186.990$; df=28, p=0.000	$\chi^2=166.961$; df=21, p=0.000
Eigenvalues % of Variance	47.624%	51.157%

In the next step, a CFA was conducted using the Bollen-Stine bootstrap, which can be used to estimate standard errors (Yung and Bentler, 1996) and to correct for bias in the model fit statistic (Bollen and Stine, 1992). In this study, iterations of 2000 bootstrap samples were conducted. In the first sub-sample, all seven items are significantly loaded on one factor – loss aversion. The absolute model fit indices (χ^2/df = 1.160, p = 0.302, GFI = 0.946, and SRMR = 0.0450), relative model fit indices (IFI = 0.987, TLI = 0.978, and NFI = 0.914), and noncentrality-based indices (RMSEA = 0.048 and CFI = 0.986) are all satisfactory. The Cronbach's alpha value for loss aversion is 0.834. To validate these results, a CFA was conducted using the second sub-sample and the combined sample. The results were satisfactory for both samples (for the second sub-sample: χ^2/df = 1.072, p = 0.380, GFI = 0.963, SRMR = 0.0479, IFI = 0.996, TLI = 0.991, NFI = 0.947, RMSEA = 0.032, and CFI = 0.996; for the combined sample, χ^2/df = 1.171, p = 0.298, GFI = 0.972, SRMR = 0.0355, IFI = 0.994, TLI = 0.989, NFI = 0.958, RMSEA = 0.035, CFI = 0.994; Table 3). The Cronbach's alpha for loss aversion was 0.824 for this second sub-sample and 0.831 for the combined sample. Therefore, the null hypothesis that the CFA model is correct is supported by the Bollen-Stine Bootstrap test (p = 0.422). In sum, the overall results suggest that the seven-item loss aversion scale has a reasonable degree of reliability and unidimensionality. Thus, the average of the scores of these items was used as the composite score for loss aversion. The validity of the loss aversion scale was tested in the next step.

Table 3
Confirmatory Factor Analysis

	Sample 1 (2000 of bootstrap samples)	Sample 2 (2000 of bootstrap samples)	Combined Sample (2000 of bootstrap samples)
Loss Aversion	λ	λ	λ
Item 1	1.000	1.000	1.000
Item 2	0.870***	1.118**	0.811***
Item 3	0.545***	1.125**	0.843***
Item 4	0.905***	1.447***	1.057***
Item 6	0.801***	1.559***	1.229***
Item 7	0.949***	2.043**	1.401***
Item 8	0.511**	1.076**	0.725***
Absolute Fit Indices	χ^2=15.084 df=13 χ^2/df=1.160 (<3) p=0.302 (>0.05) GFI=0.946 (>0.90) SRMR=0.0450(<0.080)	χ^2=9.644 df=9 χ^2/df=1.072 (<3) p=0.380 (>0.05) GFI=0.963 (>0.90) SRMR=0.0479 (<0.080)	χ^2=14.046 df=12 χ^2/df=1.171 (<3) p=0.298 (>0.05) GFI=0.972 (>0.90) SRMR=0.0355 (<0.080)
Relative Fit Indices	IFI=0.987 (>0.90) TLI=0.978 (>0.90) NFI=0.914 (>0.90)	IFI=0.996 (>0.90) TLI=0.991 (>0.90) NFI=0.947 (>0.90)	IFI=0.994 (>0.90) TLI=0.989 (>0.90) NFI=0.958 (>0.90)
Noncentrality-based Indices	RMSEA=0.048 (<0.080) CI90=(0.000, 0.133) CFI=0.986 (>0.90)	RMSEA=0.032 (<0.080) CI90=(0.000, 0.142) CFI=0.996 (>0.90)	RMSEA=0.035 (<0.080) CI90=(0.000, 0.097) CFI=0.994 (>0.90)
Cronbach Alpha	0.834	0.824	0.831
Sample Size	71	70	141

**p < 0.01, ***p < 0.001.

Validity Check

To check the validity of the seven-item loss aversion scale, correlation and regression analyses were performed for concurrent and predictive validity tests, respectively. In assessing the concurrent validity of the loss aversion scale, correlations were conducted between the composite score of this scale and those of two established and validated measures, risk aversion and risk propensity, which are the constructs conceptually related to loss aversion (e.g., Kahneman and Tversky, 1979). The data for the risk aversion and risk propensity measures were collected from the MTurk survey

discussed above. The risk aversion scale was adopted from Mandrik and Bao (2005), the risk propensity scale was from Hung and Tangpong (2010). The items of these two scales are presented in Table 4. The reliability of both scales was checked and the results were satisfactory with Cronbach's alpha values of 0.861 for risk aversion and 0.848 for risk propensity. The composite score of the loss aversion scale is expected to be positively correlated with that of the risk aversion scale and negatively correlated with that of the risk propensity scale. The results indicated that the loss aversion score was positively correlated with the risk aversion score ($r = 0.692$, $p < 0.01$) and negatively correlated with the risk propensity score ($r = -0.647$, $p < 0.01$) as theoretically expected, suggesting a reasonable degree of concurrent validity of the seven-item loss aversion scale.

Table 4
Item List

Variables	Items
Risk Aversion Item 1	I do not feel comfortable about taking chances.
Risk Aversion Item 2	I prefer situations that have foreseeable outcomes.
Risk Aversion Item 3	Before I make a decision, I like to be absolutely sure how things will turn out.
Risk Aversion Item 4	I avoid situations that have uncertain outcomes.
Risk Aversion Item 5	I feel comfortable improvising in new situations. (Reverse coding)
Risk Aversion Item 6	I feel nervous when I have to make decisions in uncertain situations.
Risk Propensity Item 1	I like to take chances, although I may fail.
Risk Propensity Item 2	Although a new thing has a high promise of reward, I do not want to be the first one who tries it. I would rather wait until it has been tested and proven before I try it. (Reverse coding)
Risk Propensity Item 3	I like to try new things, knowing well that some of them will disappoint me.
Risk Propensity Item 4	To earn greater rewards, I am willing to take higher risks.
Risk Propensity Item 5	I seek new experiences even if their outcomes may be risky.
Sunk-cost-fallacy Behavioral Tendency	When I have already invested effort, it is difficult for me to walk away even if I knew my continued effort may not work.
Endowment-effect Behavioral Tendency	I tend to hold on to what I already have.
Game 1	How likely are you going to bet in a game that offers a 50% chance to win $150 and a 50% chance to lose $100?
Game 2	How likely are you going to bet in a game that offers a 50% chance to win $200 and a 50% chance to lose $100?
Game 3	How likely are you going to bet in a game that offers a 50% chance to win $250 and a 50% chance to lose $100?
Game 4	How likely are you going to bet in a game that offers a 50% chance to win $300 and a 50% chance to lose $100?

Due to the relatively high correlations between loss aversion and risk aversion/risk propensity, it is prudent to test the discriminant validity of loss aversion with respect to risk aversion and risk propensity. To provide evidence that the unidimensional seven-item scale consistently measures loss aversion instead of risk aversion or risk propensity,

two heterotrait-monotrait (HTMT) discriminant validity tests were conducted: (a) one for the pair of loss aversion and risk aversion, and (b) the other for the pair of loss aversion and risk propensity. The results indicated the HTMT ratio for the pair of loss aversion and risk aversion was 0.816, whereas the HTMT ratio for the pair of loss aversion and risk propensity was -0.763. Both ratios are lower than the 0.85 cut-off threshold (Voorhees *et al.*, 2016), which suggests the loss aversion measured through the scale developed in this study attains an adequate level of discriminant validity.

Regarding the predictive validity test, a series of regression analyses were performed using the composite loss aversion score as a predictor of three behavioral tendencies regarding (a) the endowment effect (Kahneman *et al.*, 1991), (b) the sunk cost fallacy (Thaler, 1980), and (c) the likelihood to participate in four lottery games (Schmidt and Traub, 2002). Two general tendency statements on a seven-point scale (1 – strongly disagree and 7 – strongly agree) were used to separately operationalize the sunk cost fallacy and endowment effect tendencies of the subjects. For the four lottery games, each game has a 50-50 chance of winning and losing with the same losing outcome of a $100 loss; however, the winning outcome varies in each game ranging from a $150 to a $300 gain. Subjects were asked how likely they were to bet in each of the games on a seven-point scale (1 – very unlikely to bet and 7 – very likely to bet). Table 4 presents both tendency statements and the odd and losing/winning outcomes of the four games.

In the regression analyses, the composite score of the loss aversion scale was used as a predictor of the subjects' responses in the general tendency statements regarding sunk-cost-fallacy tendency and endowment-effect tendency, as well as their likelihood to participate in those four games. The multicollinearity issues were checked (Aiken and West, 1991), and the VIF values ranged from 1.097 to 3.339, which are far below the cut-off of 10 recommended by Neter *et al.* (1985). Thus, there was no significant concern of multicollinearity. Then six hierarchical multiple regressions were performed using the composite loss aversion score as the independent variable to predict those six dependent variables (i.e., the two behavioral tendencies and the likelihood to participate in each of those four games). Subjects' gender, age, ethnicity, and employment status were controlled. Additionally, risk aversion and risk propensity were controlled. The results of the regression analyses are presented in Table 5.

The results showed the loss aversion score was significantly and positively related to the subjects' responses in both sunk-cost-fallacy behavioral tendency (Model 1, β = 0.204, $p_{(\beta)}$ = 0.085, ΔR^2 = 1.9%, $p_{(\Delta R2)}$ = 0.085) and endowment-effect behavioral tendency (Model 2, β = 0.269, $p_{(\beta)}$ = 0.018, ΔR^2 = 3.2%, $p_{(\Delta R2)}$ = 0.018). In addition, the loss aversion score was negatively related to the subjects' likelihood to participate in each of the four games (Model 3, β = -0.203, $p_{(\beta)}$ = 0.092, ΔR^2 = 1.8%, $p_{(\Delta R2)}$ = 0.092; Model 4, β = -0.237, $p_{(\beta)}$ = 0.047, ΔR^2 = 2.5%, $p_{(\Delta R2)}$ = 0.047; Model 5, β = -0.338, $p_{(\beta)}$ = 0.003, ΔR^2 = 5.1%, $p_{(\Delta R2)}$ = 0.003; Model 6, β = -0.382, $p_{(\beta)}$ = 0.001, ΔR^2 = 6.5%, $p_{(\Delta R2)}$ = 0.001). These results support that loss aversion, as a theoretical construct, makes a unique contribution to the explained variance in the three behavioral tendencies, even after controlling for the impacts of risk aversion and risk propensity. Thus, these results provide evidence supporting the predictive validity and further strengthen the discriminant validity of this loss aversion scale. In summary, the results of both correlation and regression analyses, taken together, suggest the seven-item loss aversion scale proposed in this study attains a reasonable degree of measurement validity.

Table 5
Robust Tests: Regression Analysis
(N=141)

DVs	Model 1 Sunk-cost-fallacy Behavioral Tendency		Model 2 Endowment-effect Behavioral Tendency		Model 3 Game 1	
	Control	Full	Control	Full	Control	Full
Independent Variable	β (p-value)	β (p-value)	β (p-value)	β (p-value)	β (p-value)	β (p-value)
Loss Aversion		**0.204†** **(0.085)**		**0.269*** **(0.018)**		**-0.203†** **(0.092)**
Controls						
Risk Aversion	0.464** (0.001)	0.381** (0.009)	0.098 (0.461)	-0.012 (0.930)	-0.214 (0.126)	-0.131 (0.371)
Risk Propensity	0.220 (0.100)	0.291* (0.037)	-0.137 (0.288)	-0.043 (0.743)	0.150 (0.268)	0.079 (0.572)
Gender	0.074 (0.387)	0.097 (0.256)	0.139† (0.092)	0.171* (0.038)	0.016 (0.854)	-0.008 (0.929)
Age	-0.104 (0.239)	-0.084 (0.342)	-0.195* (0.024)	-0.168* (0.048)	-0.045 (0.618)	-0.065 (0.472)
White	-0.114 (0.232)	-0.104 (0.366)	0.251* (0.026)	-0.237* (0.032)	0.000 (1.000)	-0.10 (0.929)
African American	-0.064 (0.524)	-0.045 (0.654)	-0.005 (0.961)	0.020 (0.832)	0.065 (0.525)	0.046 (0.652)
Asian or Pacific Islander	0.002 (0.981)	0.012 (0.887)	-0.074 (0.389)	-0.060 (0.476)	-0.091 (0.311)	-0.101 (0.257)
Hispanic or Latino	0.002 (0.984)	0.008 (0.927)	-0.097 (0.281)	-0.088 (0.317)	-0.013 (0.887)	-0.020 (0.831)
American Indian or Alaskan Native	-0.137 (0.109)	-0.136 (0.107)	0.069 (0.400)	0.070 (0.387)	-0.104 (0.228)	-0.105 (0.222)
Other Ethnicity	0.051 (0.535)	0.034 (0.680)	-0.209** (0.010)	-0.231** (0.004)	0.089 (0.291)	0.106 (0.208)
Full time vs. Part time	0.053 (0.540)	0.044 (0.606)	0.110 (0.186)	0.099 (0.227)	0.097 (0.268)	0.106 (0.225)
R^2 changes (p-value)	0.019 (0.085)		0.032 (0.018)		0.018 (0.092)	

†p < 0.10, *p < 0.05, **p < 0.01

Table 5 (continued)
Robust Tests: Regression Analysis
(N=141)

DVs	Model 4 Game 2		Model 5 Game 3		Model 6 Game 4	
	Control	**Full**	**Control**	**Full**	**Control**	**Full**
Independent Variable	β (p-value)	β (p-value)	β (p-value)	β (p-value)	β (p-value)	β (p-value)
Loss Aversion		**-0.237*** **(0.047)**		**-0.338**** **(0.003)**		**-0.382**** **(0.001)**
Controls						
Risk Aversion	-0.240† (0.084)	-0.143 (0.323)	-0.291* (0.029)	-0.153 (0.263)	-0.271* (0.049)	-0.115 (0.410)
Risk Propensity	0.143 (0.289)	0.060 (0.665)	0.144 (0.263)	0.027 (0.839)	0.130 (0.327)	-0.003 (0.984)
Gender	0.093 (0.282)	0.065 (0.451)	0.133 (0.108)	0.094 (0.248)	0.071 (0.406)	0.026 (0.753)
Age	-0.096 (0.284)	-0.119 (0.182)	-0.087 (0.310)	-0.120 (0.152)	-0.053 (0.549)	-0.090 (0.292)
White	0.20 (0.864)	0.008 (0.946)	-0.002 (0.983)	-0.020 (0.855)	-0.023 (0.843)	-0.043 (0.702)
African American	0.160 (0.117)	0.138 (0.174)	0.126 (0.197)	0.094 (0.321)	0.068 (0.500)	0.032 (0.742)
Asian or Pacific Islander	-0.066 (0.462)	-0.078 (0.380)	-0.066 (0.441)	-0.083 (0.318)	-0.109 (0.216)	-0.129 (0.132)
Hispanic or Latino	0.032 (0.735)	0.024 (0.765)	0.056 (0.531)	0.045 (0.603)	0.052 (0.576)	0.040 (0.658)
American Indian or Alaskan Native	-0.122 (0.155)	-0.123 (0.148)	-0.149† (0.071)	-0.150† (0.061)	-0.168* (0.049)	-0.169* (0.040)
Other Ethnicity	0.068 (0.417)	0.088 (0.292)	0.124 (0.122)	0.153* (0.052)	0.097 (0.239)	0.129 (0.107)
Full time vs. Part time	0.043 (0.619)	0.053 (0.536)	0.085 (0.309)	0.099 (0.221)	0.025 (0.769)	0.041 (0.617)
R² changes (p-value)	0.025 (0.047)		0.051 (0.003)		0.065 (0.001)	

†p < 0.10, *p < 0.05, **p < 0.01

DISCUSSION AND CONCLUSION

Traditionally, an individual's loss aversion tendency is measured through WTA/WTP experiments or hypothesized lotteries, which are either not reliable or too lengthy and time-consuming. This study develops a simple, reliable, and valid measurement scale for loss aversion. The scale captures the original idea described by Kahneman and Tversky (1979) by measuring loss aversion in a much broader sense than monetary loss. This scale therefore can be used in scenarios where status quo change (rather than monetary loss) is involved. Examples of such scenarios include consumers' new product adoption and satisfaction with new service policies, firms' business portfolio restructures and reorganizations, and startups' entrepreneurial actions.

There are broad potential applications of this new scale. In finance, the scale could be used to examine how loss aversion affects investors' portfolio management strategies, e.g., when to buy or sell and how long to hold a certain investment. Another potential application of this loss aversion scale could be in the education and training of professional traders because research shows that even professional traders are significantly affected by loss aversion (Haigh and List, 2005). This loss aversion scale provides a reliable, valid, and efficient way to measure and improve the quality of trader training programs. Additionally, in consumer marketing, this scale could be used to examine how an individual consumer's loss aversion affects his/her brand selection, adoption of new products, willingness to sell or buy used products, and satisfaction with the changes of customer service policies. In business-to-business marketing and supply chain management, this scale can be used to study how buyers with different levels of loss aversion tendency make decisions regarding order quantity, order timing, and inventory level.

From the strategic and organizational standpoint, the loss aversion scale could be a useful instrument to assess the behavioral tendency of top executives tasked with key strategic decisions, such as restructuring business portfolios, divestitures, and reorganizations (e.g., Bergh and Lawless, 1998; Nippa *et al.*, 2011). These types of high-level decisions tend to concurrently involve substantive degrees of gains and losses. If unaware of their inherent loss aversion tendency, top executives may not adequately guard against such tendency, and may make strategic decisions that are far from optimal. Knowing their own loss aversion tendency could help executives to be more conscious about their potential biases in the decision processes. As such, they are more likely to reach sound decisions.

This loss aversion scale could also be used to potentially extend the understanding of entrepreneurial action. Specifically, it would be interesting to apply loss aversion to theorizing about the stages of entrepreneurial action. McMullen and Shepherd (2006) offer a model of entrepreneurial action that has been widely adopted in the field of entrepreneurship. Their model has two key stages. The first stage addresses attention, when a person recognizes a third-person opportunity arising from a technological change, and the second stage addresses evaluation, when a person assesses the opportunity. Although this framework pays considerable attention to an entrepreneur's risk/return dilemma, it does not consider the entrepreneur's loss aversion tendency. Extending McMullen and Shepherd's (2006) framework to consider the role that loss aversion plays in the decision to engage in entrepreneurial action would be interesting and potentially elaborative for the understanding of the entrepreneur. At the same time, this loss aversion scale could be used as an effective tool for potential entrepreneur's self-assessment and self-training.

While this study has taken the initial step toward developing a loss aversion scale, it has limitations. First, although the study used the split sample and bootstrap techniques to ensure some degree of robustness, the scale development process involved only one sample of general public; thus, the scale needs to be further tested with business professionals in different business functions. The main goal of this study is to develop a scale that can replace complex behavioral experiments. However, although the results from this study are encouraging, further replications of the scale are needed to make this scale more reliable, valid, and generalizable. Until then, this current scale is best used in conjunction with traditional experiments. Furthermore, as this survey was

conducted in one single country (i.e., the United States), it is hard to make statements about its generalizability. Future work is encouraged to validate this scale in other geographic areas and cultures. At the same time, researchers are encouraged to use some cultural identity scale to serve as a moderator when using this loss aversion scale. Second, the predictive validity of this loss aversion scale was tested in only two types of related behavioral tendencies – the sunk cost fallacy and the endowment effect. Therefore, future research is needed to test the predictive validity of this scale in more types of related behavioral tendencies, such as the status quo bias, the attraction effect, and the compromise effect. In addition, there are only four lottery games used in this study and all of them are mixed gain/loss games. Future studies could include more complex games. Third, this scale was developed by operationalizing the construct in a much broader sense than monetary loss. Although in this study, the loss aversion scale (without monetary loss items) successfully predicted the subjects' likelihood to participate in the games involving monetary loss, it is not clear whether losing money is significantly different from losing other items to the point of needing to be excluded from the scale. Future research could look at this issue, especially over time through both economic expansion and recessions. Along the same line of reasoning, future research could also apply this loss aversion scale to longitudinal studies that include financial or economic situation variables. Such research could capture the influence of external economic factors on the temporal aspects of this construct. Finally, the current study did not manipulate or measure respondents' moods or emotions. Since prior research found that emotions such as fear, anger, and sadness would affect loss aversion (e.g., Campos-Vazquez and Cuilty, 2014), future research could test the reliability and applications of this loss aversion scale while including personal moods and emotions as moderating factors.

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Measuring Strategic Thinking in Organizations

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Abstract: Strategic thinking is an important construct in management research, and the ability to measure it is necessary for empirical research in the area to thrive. The objective of this study is to develop, test, and validate an instrument that scholars can use to measure strategic thinking in an organizational context. A survey methodology is employed to develop the instrument, and to test its reliability and validity. The resulting fourteen-item scale displays robust convergent, discriminant, and nomological validity. The development of the instrument offers avenues for empirical research in multiple areas of management where the strategic thinking construct may be applied, including strategic management, organizational theory/design/change, organizational behavior, and human resource development, among others.
Keywords: Strategic thinking, measurement instrument, scale development

Competing in a constantly changing business environment brings with it a slew of challenges for organizations, and this has engendered much scholarly interest (Birkinshaw *et al*., 2016; Helfat and Martin, 2015; Schilke, 2014). One outcome of this stream of inquiry is the recognition that managerial action is increasingly governed by the quality of strategic thinking espoused by managers (Wilson, 1994; Dragoni *et al*., 2014; Zahra and Nambisan, 2012). Strategic thinking has generally been characterized as an organizational capability when the phenomena have been studied in the context of the strategic actions of the organization (Bernhut, 2009; Nuntamanop *et al*., 2013; Simester, 2016; Goldman, 2012). Further, scholars have used multiple theoretical lenses to explore the role of strategic thinking in organizational contexts. These include, but

are not limited to, strategic management, organizational behavior, and human resource management (Goldfarb and Yang, 2009; Moon, 2013). For example, strategic thinking has been linked to effective strategic change (Tregoe and Zimmerman, 1980), strategic renewal (Zahra and Nambisan, 2012), organizational innovation (Dragoni *et al.*, 2014; Graetz, 2002), opportunity recognition (Hanford, 1995), leadership development (Dragoni *et al.*, 2014), team building, and team-based decision-making (Bates and Dillard Jr., 1993; Thomas and McDaniel Jr., 1990). These illustrative examples attest to Hickman and Silva's (2017) assertion that strategic thinking is one of the cornerstones of organizational excellence and that it warrants a thorough understanding.

Despite the widespread recognition of the critical role of strategic thinking in organizational research, there is limited consensus on a well-accepted measure of the construct (Steptoe-Warren *et al.*, 2011). As a result, strategic thinking has failed to gain the level of inclusion it deserves in organizational research (Goldman *et al.*, 2015; Nuntamanop *et al.*, 2013; Simester, 2016). Existing measures have been found to either lack robustness of scale development or are idiosyncratic to the research context (Dragoni *et al.*, 2014; Moon, 2013; Pisapia *et al.*, 2005). As Goldman and Scott note, "Many of these measures were not based on a definition of strategic thinking found in the literature. In the few cases where weak correlations were established, different conclusions with respect to their significance were reported across studies" (2016: 261).

The objective of this study is to develop, test, and validate an instrument that can be used by management scholars to measure strategic thinking in an organizational context. The instrument development process starts with a review of scholarly discourse on strategic thinking. This stream of scholarly thought is then used to develop an instrument to measure the construct of strategic thinking.

SCHOLARLY DISCOURSE ON STRATEGIC THINKING

Several scholars have offered descriptions of the strategic thinking construct. For example, Struebing (1996: 22) describes strategic thinking as "a dynamic process that continually reviews missions, strategies, and operations relative to customers' needs and market forces." In the same vein, Graetz (2000: 457) suggested that strategic thinking is about "seeking innovation and imagining new and very different futures that may lead a company to redefine its core strategies and its industry." Recent efforts to integrate prior characterizations of strategic thinking have made good progress. An example of this is the competency-anchored description by Nuntamanop *et al.* (2013), where strategic thinking is described as, "a set of (managerial) competency that impacts strategy formulation and strategic actions leading to business performance."

Early literature used the concept of strategic thinking and strategic planning interchangeably. However, later discussions confirmed strategic thinking precedes strategic planning (Heracleous, 1998; Liedtka, 1998; Mintzberg, 1994; Graetz, 2002). The recent literature conceptualizes strategic thinking as a capability, and provides support that strategic thinking is comprised of various cognitive capabilities of individuals (e.g., Dhir *et al.*, 2018; Goldman and Scott, 2016; Gross, 2017, 2016; Norzailan *et al.*, 2016; Nuntamanop *et al.*, 2013). Thinking, in general, is a cognitive ability that allows individuals to construct a mental frame around a specific context (Gottfredson, 1997). Thus, it is appropriate to conceptualize strategic thinking as a capability. The role of strategic thinking at the organizational level is critical because of

its manifestation in strategic planning and strategic decision-making. Organizations, however, do not think but think through their managers/ leaders. Thus, managers represent the core of strategic thinking capability, while outcomes are portrayed at the organizational level (Argote and Ingram, 2000; Barnard, 1968).

Scholars agree that strategic thinking is a multidimensional construct, and a consensus on the underlying dimensions of the construct has emerged. Early research (see Rowe *et al.*, 1986) suggested that strategic thinking may consist of four elements – vision, creativity, flexibility, and entrepreneurship. Later, Liedtka (1998) proposed a model of strategic thinking that included: a systems-thinking perspective, intent-focused, thinking-in-time, hypothesis-driven, and being intelligently opportunistic. About the same time, Heracleous (1998) characterized strategic thinking as creative thinking (i.e., divergent thought processing), and synthetic (i.e., recursive reflection on present and past experiences to envision/synthesize future options). Graetz (2002) viewed strategic thinking as creative/ intuitive/innovative thinking (that involves divergent thought processing). Bonn (2005) presented a model of strategic thinking that incorporated systems thinking, creative thinking (i.e., divergent thought processing), and vision orientation thinking (i.e., similar to Heracleous' (1998) notion of recursive reflection/synthesis to envision the future). At about the same time, Pisapia *et al.* (2005) described a model of strategic thinking also based on three similar dimensions – systems thinking, reframing (i.e., divergent thought processing), and reflection (i.e., recursive review and synthesis to envision the future).

Two recent studies help stitch together the elements of strategic thinking identified in prior research. Both studies used grounded-theory methodologies that provide the additional benefit of raw evidence obtained from practicing managers to support the appropriateness of a multi-dimensional operationalization of the strategic thinking construct. As will be argued below, both studies point to a three-dimensional operationalization of the strategic thinking construct in an organizational context.

The first study, by Nuntamanop *et al.* (2013), found managers in the field identified seven elements that best reflect their strategic thinking – conceptual thinking ability, visionary thinking, analytical thinking ability, synthesizing ability, objectivity, creativity, and learning ability. The authors then compared these items to the dimensional frameworks proposed by scholars. They concluded that the dimensional operationalization offered by Heracleous (1998), Graetz (2002), and Bonn (2005), together, best captured the elements of strategic thinking expressed by the practicing managers polled in their study. A fourth operationalization is added by Pisapia *et al.* (2005) to the list of three identified by Nuntamanop *et al.* (2013). A closer review of the four theoretically anchored operationalizations noted above suggests that they reflect three core dimensions. The first dimension is "systems thinking" that is noted by Bonn (2005) and Pisapia *et al.* (2005). The second is "divergent thought processing" that leads to creative outcomes as noted by Heracleous (1998), Graetz (2002), Bonn (2005), and Pisapia *et al.* (2005). The third is "reflection" that represents the recursive use of knowledge and experiences to synthesize a new vision for the future, as characterized by Heracleous (1998), Bonn (2005), and Pisapia *et al.* (2005).

The second study by Goldman and Scott (2016) found strategic thinking is represented in four types of mental sense-making processes of managers (conceptual, system-oriented, directional, and opportunistic thinking) that have four recursive characteristics (scanning, questioning, conceptualizing, and testing). These eight

elements map well to the three dimensions of strategic thinking noted earlier. One of the three, systems thinking, is singled out as a mental sense-making component of strategic thinking in the Goldman and Scott (2016) study. Divergent thought processing maps to another mental sense-making component in the same study, i.e., opportunistic thinking that leads to the discovery of novel, imaginative organizational strategies. Finally, reflection is represented by several elements identified by managers in Goldman and Scott's (2016) study, including the conceptual and directional mental process developed over time, and the recursive processing characteristics of scanning, questioning, conceptualizing, and testing.

The Three Dimensions of Strategic Thinking

The literature review (above) suggests that strategic thinking is a multi-dimensional construct, and when operationalized in an organizational context, the construct can be represented along three dimensions – systems thinking, divergent thought processing, and reflection. A more detailed characterization of the three dimensions of strategic thinking is provided in this section. This information will be used in the subsequent section to develop the measurement instrument.

The "Systems Thinking" Dimension. Systems thinking (Von Bertalanffy, 1950) reflects the holistic view of the organization that managers must adopt to understand complex interrelationships. In an organizational context, systems thinking enables a comprehensive understanding of interconnections among elements of the organizational system (Capra, 2002; Pisapia *et al.*, 2005). As Liedtka suggests, a strategic thinker should have complete knowledge of the "end-to-end system of value creation and interdependencies within it" (1998: 122). However, managerial decision-making is also influenced by changes occurring in the external environment. Hence, a manager's ability to think strategically must also include his/her ability to think beyond the domain of the organization to a universe of interconnected and interdependent systems that are outside the organization (Moon, 2013; Fontaine, 2008; Bonn, 2005; Kaufman, 1991; Senge, 1990). Therefore, in the context of strategic thinking, systems thinking is defined as the ability to view the organization holistically by recognizing the interdependencies *within* the organization and *across* organizations.

The "Divergent Thought Processing" Dimension. Strategic thinking must enable managers to adopt and integrate divergent views in order to comprehend the complexities of organizational systems (Zahra and Nambisan, 2012). Divergent thought processing enables managers to think beyond existing conceptions and beliefs and connect events and issues that may otherwise seem unrelated (Robinson *et al.*, 1997; De Bono, 1996) often leading to creative new insights and solutions (De Bono, 1996; Pisapia *et al.*, 2005). Thus, divergent thought processing encompasses a broad skill-set that subsumes multiple thinking styles found in scholarly operationalizations of strategic thinking such as creative thinking, divergent thinking, intuitive thinking, innovative thinking, and hypothesis-driven thinking (Bonn, 2005; Rowe *et al.*, 1986; Mintzberg, 1994; Heracleous, 1998; Graetz, 2002; Liedtka, 1998). Further, Pisapia *et al.* (2005) and Bolman and Deal (1991) note that divergent thought processes allow managers to be cognizant of the differences between competing perspectives and allow them to reframe a situation in the given context. Therefore, in the context of strategic thinking, divergent thought processing is defined as the ability to identify, differentiate, and use diverse perspectives to assess an organizational situation.

The "Reflection" Dimension. Reconciling competing hypotheses is a necessary element of the strategic thinking process (Zahra and Nambisan, 2012). Reflection represents a recursive process used by managers to analyze a situation by referencing existing beliefs, perceptions, and experiences, and then using the knowledge to reconcile competing hypotheses and to arrive at a conclusion (Dewey, 1933). Scholars have noted that the process of reconciliation involves interactions of one's own experiences and perceptions with the experience and perceptions of other individuals (Argyris and Schon, 1996). Rodgers (2002) supported this notion and suggested that "an experience, then, is not experience unless it involves an interaction between the self and another individual" (p: 846). In an organizational context, Pisapia *et al.* (2005) note that reflection can be introspective and can also occur in a community with others, as multiple managers reflect on a given situation to make joint decisions. Reflection, therefore, consists of using not just own experience, perception, and knowledge but using others' interpretation of a situation as well. Hence, in the context of strategic thinking, reflection is defined as the ability to use *one's own* beliefs, perceptions, and experiences, *and those of others*, to assess an organizational situation.

METHOD

Instrument Development

The instrument development procedure employed in this study follows the recommendations of Hinkin (1998). This approach has been tested and used in prior instrument developments (see, for example, Holt *et al.*, 2007; Oreg, 2003; Shaffer *et al.*, 2016; Sieger *et al.*, 2016). Further, a deductive approach is used to develop the instrument. Instead of developing items afresh, previous operationalization of strategic thinking were reviewed to select items (Pisapia *et al.*, 2005) to seed the development process. It should be emphasized that these items only represent a starting point for the iterative item-development exercise. This approach is deemed appropriate because it leverages prior work and provides reasonable guide rails to kick-off the development process. The process is depicted in Figure I.

Two rounds of Q-sort exercises were undertaken to improve the face validity of items (Nahm *et al.*, 2002). The first Q-sort exercise (panel consists of two business-school professors and three management Ph.D. students) resulted in a preliminary set of 28 items. These 28 items underwent a second Q-sort exercise (three Ph.D. students) to improve the dimension-item correlation.

Next, the items were presented to an individual with extensive industry experience in the C-suite at a large US corporation. Feedback from and discussions with the panelist resulted in a reduced set of 21 items with language better suited for practitioners. Finally, two more panelists (whose native language was English) were used to polish the syntax, style, and structure of the items.

Item Generation

The item generation process began by classifying the un-stratified pool of items from the selected scale at the dimensional and the sub-dimensional levels. For example, the definition of the system's thinking dimension (noted earlier in the paper) suggests two sub-dimensions – interdependencies *within* the system, and interdependencies *across*

systems. Hence, items were selected from the pool that best represented these two sub-dimensions. A similar approach was undertaken to select items associated with the three sub-dimensions of divergent thought processing (i.e., ability to "*identify*, *differentiate*, and *use*" diverse perspectives) and the two sub-dimensions of reflection (i.e., ability to use "*one's own perception, experience, and knowledge*" and "*the perspectives, experiences, and knowledge of others*"). This resulted in seven (2 + 3 + 2) baskets of items to seed the subsequent Q-sort exercises.

Figure I
Scale Development Process

Step 1
Item Generation

Step 2
Questionnaire Administration

Step 3
Exploratory Factor Analysis

Step 4
Confirmatory Factor Analysis

Step 5
Covergent/Discriminant
Validity

Step 6
Replication
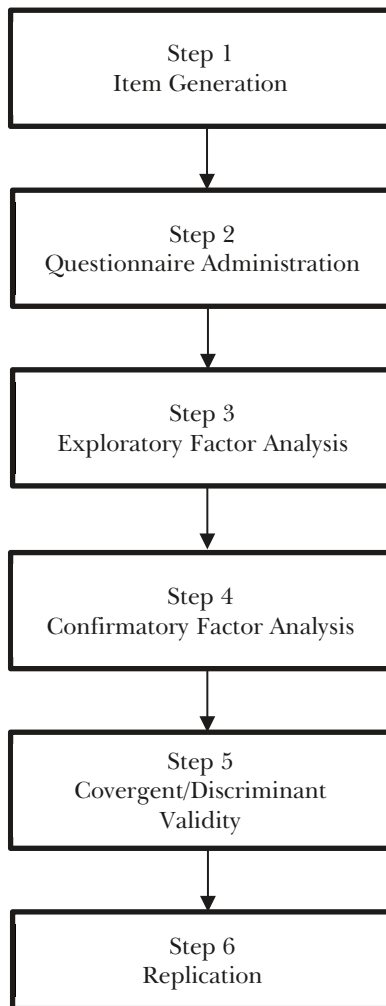
Questionnaire Administration

Sample. The target respondents in the pilot test were senior to middle-level managers with five or more years of experience. The context of this study is firms operating in high technology (hi-tech) industries since they are constantly adapting to change (Cruz-González *et al*., 2015; Thornhill, 2006), making strategic thinking particularly relevant. Industries with SIC codes 7371 (computer programming services), 7372 (pre-packaged software), and 7373 (computer integrated system design) were selected as the fastest growing sectors based on past and projected future output growth from 2012-2022 (U.S. Bureau of Labor Statistics, 2013).

Sampling technique. Panel data was obtained using services provided by Qualtrics (Long *et al*., 2011). They invited only pre-screened respondents to ensure the legitimacy of respondents (Hagtvedt, 2011). In addition to Qualtrics own screening algorithms, the authors embedded another screening question in the survey instrument. The context required to select a key informant from each firm. Previous studies have supported the key-informant approach because such respondents have been shown to provide a valid representation of organizational phenomenon (Garg *et al.*, 2003; Li and Atuahene-Gima, 2002).

Exploratory Factor Analysis

Pilot sample. A total of 158 responses were collected. Data were subjected to principal component analysis with direct oblimin rotation. The initial factor structure resulted in only two components with Eigenvalues of 10.93 and 1.81. The respective variance explained was 52.07% and 8.64%. Because of the initial factor structure, targeted items were reworded and refined across all dimensions. Items were modified and worded to simplify them. The focus was to present the items in practitioner parlance and with a capability perspective. Since strategic thinking is characterized as a capability, items are reworded to reflect the underlying ability associated with a specific activity. In addition, the organizational context was incorporated into the items so that it would be more meaningful to the target audience (organizational managers). For example, the original scale item "consider how one thing seems to lead to the next in a nonlinear way" does not adequately reflect a context and can be interpreted in multiple ways. This item was modified to "we recognize that actions of a department can influence the action of another department within our organization." This was done to highlight the specific context that respondents should consider when answering the question. In this case, the interconnection between different departments of an organization. Further, all "double-barreled" items were appropriately modified. For example, the item "Track trends by asking everyone what is new or what is changing" was appropriately modified, contextualized, and presented as an ability instead of an activity, "We recognize that change in market trends require adjustments in our business activities." The new item appropriately represents the ability to identify the relationship between market trends and business activities and focuses on change rather than both "what is new" and "what is changing." One item was added to the reflection dimension making for a total of 22 items in the instrument. The new item, "we seek help from individuals across the organization to reflect on past organizational actions" deemed necessary as the existing item "We seek help from individuals within our department to reflect on the effectiveness of past organizational actions" seemed narrow in scope.

Table 1
Rotated Pattern Matrix of 14-Item Scale for Strategic Thinking

		Factors Loadings		
		1	2	3
	STRATEGIC THINKING			
	SYSTEMS THINKING (Cronbach's alpha = 0.80)			
ST1.1	We recognize the importance of collaborative actions among employees within our organisation.	-0.07	0.10	**0.79**
ST1.2	We recognize that actions of a department can influence action of another department within our organisation.	0.02	0.14	**0.76**
ST2.1	We recognize that change in customer needs can drive change in our product/service offerings.	0.22	0.06	**0.67**
ST2.2	We recognize that change in market trends require adjustments in our business activities.	0.30	-0.05	**0.62**
	DIVERGENT THOUGHT PROCESSING (Cronbach's alpha = 0.85)			
DTP1.1	We are aware that there are multiple approaches to evaluate a business problem.	**0.60**	-0.05	0.16
DTP1.2	We are aware that there are multiple approaches to resolve a business problem.	**0.81**	-0.20	0.14
DTP2.1	Discussion with others helps us differentiate among different approaches used to describe a business problem.	**0.69**	0.07	0.07
DTP2.2	Discussion with others helps us differentiate among different approaches used to evaluate a business problem.	**0.71**	0.00	0.18
DTP3.1	We use multiple approaches to describe a business problem.	**0.74**	0.32	-0.24
DTP3.2	We use multiple approaches to evaluate a business problem.	**0.68**	0.24	-0.07
	REFLECTION (Cronbach's alpha = 0.81)			
RFN1.1	We reflect on how we could have handled past organisational actions differently.	0.18	**0.68**	-0.07
RFN1.2	We reflect on why some organisational actions worked and why other organisational actions did not work.	0.09	**0.71**	0.15
RFN2.1	We seek help from individuals within our department to reflect on the effectiveness of past organisational actions.	-0.06	**0.85**	0.07
RFN2.2	We seek help from individuals across the organisation to reflect on past organisational actions.	-0.06	**0.78**	0.11
Eigenvalue		6.02	1.67	1.09
Variance Explained		43.01	11.96	7.82
Cumulative		43.01	54.97	62.79

ST = Systems Thinking; DTP = Divergent thought processing; RFN = Reflection

These changes necessitated another investigation of the factor structure with a new data set. A slightly smaller sample of 101 responses was collected, and 86 responses were retained and analyzed. All 22 items were subjected to principal component analysis with direct oblimin rotation. Sample adequate for the factor analysis was maintained (Kaiser-Meyer-Olkin (KMO): 0.883, and a significant Bartlett's test of sphericity: chi-square = 1283.65, df = 231, p < 0.001). The results indicated an improved factor structure displaying three components with Eigenvalues of 10.45, 2.63, and 1.28 (respective variance explained was 47.53%, 11.98%, and 5.81%).

Full sample. A sample of 324 responses was now used (out of a total of 436 responses received) for instrument validation purposes. However, to make the sample more representative of senior management, the selection criteria was raised to ten years of experience. A split-sample approach was adopted to complete this task. The sample was randomly split into two sub-samples using the SPSS "select cases" option. The random splitting generated two subsamples: Sample 1 (n = 169) was used to examine the factor structure, and sample 2 (n = 155) was used to perform a confirmatory factor analysis (DeVellis, 2003), and to conduct nomological validation.

Confirmatory Factor Analysis

After the first round of EFAs and item reductions based on cross-loadings, fourteen items were retained. The second factor analysis with fourteen items showed sampling adequacy (KMO: 0.859 and Bartlett's test of sphericity: chi-square = 1120.79, df = 91, p < 0.001). The results using the fourteen items indicated a three-factor solution with Eigenvalues of 6.02, 1.67, and 1.09. The respective variance explained were 43.01%, 11.96%, and 7.82%. Total explained variance was 62.79%, exceeding the minimum level of explained variance (60%) suggested by Hinkin (2005). The pattern matrix is displayed in Table 1.

The final instrument contained four systems thinking items (Cronbach's alpha: 0.8), six divergent thought processing items (Cronbach's alpha: 0.85), and four reflection items (Cronbach's alpha: 0.81).

Convergent, Discriminant, and Nomological Validity

Convergent and discriminant validity of the measurement instrument were assessed using the holdout sample (n = 155). Ashill and Jobber's (2010) recommendation was followed to use SEM-based PLS methodology to perform the confirmatory factor analysis because of the small sample size (Barclay *et al.*, 1995). Convergent validity was assessed using three criteria: item reliability, composite reliability (CR), and average variance explained (AVE). As shown in Table 2, item reliability was adequate with all items exhibiting loadings above 0.7 (Bagozzi, 1979; Fornell and Larcker, 1981) and significant t-statistics. The CR statistics for systems thinking, divergent thought processing, and reflection (0.88, 0.86, and 0.89 respectively) were above the 0.7 cut-off point, which suggests good composite reliability (Chin, 1998). Finally, AVE values for systems thinking, divergent thought processing, and reflection (0.65, 0.52, and 0.69 respectively) were all above the threshold of 0.50, providing support for convergent validity (Fornell and Larcker, 1981).

Table 2
The Measurement Model

	Items	Loading	t-stats	CR	AVE
	STRATEGIC THINKING				
	SYSTEMS THINKING			0.88	0.65
ST1.1	We recognize that actions of a department can influence action of another department within our organization.	0.71	6.94		
ST1.2	We recognize the importance of collaborative actions among employees within our organization.	0.85	10.15		
ST2.1	We recognize that change in customer needs can drive change in our product/service offerings.	0.77	6.83		
ST2.2	We recognize that change in market trends require adjustments in our business activities.	0.87	10.61		
	DIVERGENT THOUGHT PROCESSING			0.86	0.52
DTP1.1	We are aware that there are multiple approaches to evaluate a business problem.	0.73	12.29		
DTP1.2	We are aware that there are multiple approaches to resolve a business problem.	0.63	6.98		
DTP2.1	Discussion with others helps us differentiate among different approaches used to describe a business problem.	0.72	11.19		
DTP2.2	Discussion with others helps us differentiate among different approaches used to evaluate a business problem.	0.74	12.44		
DTP3.1	We use multiple approaches to describe a business problem.	0.74	15.38		
DTP3.2	We use multiple approaches to evaluate a business problem.	0.76	17.19		
	REFLECTION			0.89	0.69
RFN1.1	We reflect on how we could have handled past organizational actions differently.	0.86	35.5		
RFN1.2	We reflect on why some organizational actions worked and why other organizational actions did not work.	0.82	17.37		
RFN2.1	We seek help from individuals across the organisation to reflect on past organizational actions.	0.79	18.53		
RFN2.2	We seek help from individuals within our department to reflect on the effectiveness of past organizational actions.	0.84	25.12		

ST = Systems Thinking; DTP = Divergent thought processing; RFN = Reflection; CR = Composite Reliability; AVE = Average Variance

Table 2 (Contd.)
The Measurement Model

	Items	Loading	t-stats	CR	AVE
	ABSORPTIVE CAPACITY				
	ACQUISITION			0.86	0.62
AQ1	Our employees frequently visit with suppliers to acquire new information.	0.84	38.6		
AQ2	Our employees frequently monitor competitors to acquire new information.	0.82	25.11		
AQ3	Our employees frequently meet with customers to acquire new information.	0.79	19.6		
AQ4	Our employees frequently collect industry information through informal channels.	0.67	8.65		
	ASSIMILATION			0.95	0.77
AS1	We quickly analyse shifts in the market.	0.86	31.7		
AS2	We quickly analyse changes in market demand.	0.84	22.09		
AS3	We quickly analyse the changing competitive dynamics of the market.	0.91	46.71		
AS4	We quickly interpret shifts in the market.	0.87	34.38		
AS5	We quickly interpret changes in market demand.	0.88	40.44		
AS6	We quickly interpret the changing competitive dynamics of the market.	0.90	55.19		
	TRANSFORMATION			0.9	0.65
TR1	Our employees efficiently generate new business plans.	0.83	24.36		
TR2	Our organisation is efficient at designing new value-creation processes.	0.85	30.21		
TR3	Our organisation is efficient at redesigning organisational policies and procedures.	0.85	35.88		
TR4	Our employees share practical experiences to weed out poor business ideas.	0.73	16.25		
TR5	Our organisation has well-established business processes to disseminate new ideas across the organisation.	0.76	20.02		
	EXPLOITATION			0.82	0.60
EX1	Customer complaints are quickly addressed.	0.78	16.37		
EX2	Customer needs are addressed through delivering new solutions.	0.78	16.06		
EX3	We rarely experience difficulty in delivering value to our customers.	0.76	9.14		

AQ = Acquisition; AS = Assimilation; TR = Transformation; EX = Exploitation;
CR = Composite Reliability; AVE = Average Variance Explained

Discriminant validity was assessed using criteria suggested by Fornell and Larcker (1981). As shown in Table 3, the square root of AVE for each latent construct was higher than its correlation with the other construct. Hence, discriminant validity is inferred.

To assess the nomological validity of the measurement instrument, the relationship between strategic thinking and absorptive capacity was examined. Absorptive capacity is characterized as a dynamic capability of the organization (Zahra and George, 2002). Scholars have demonstrated the existence of a relationship between strategic thinking and absorptive capacity. For example, Boal and Hooijberg (2001) suggested that a key outcome of strategic thinking is the development of absorptive capacity that contributes to organizational performance. Other scholarly works also support this contention (see, for example, Daspit *et al.*, 2016; Lanza and Passarelli, 2014). Table 4 shows a strong correlation between strategic thinking and absorptive capacity.

Daspit and D'Souza's (2013) modified instrument was used to operationalize absorptive capacity. Linear regression from SPSS was employed to test the relationship. As shown in Table 5, the beta coefficient of the regression between strategic thinking and absorptive capacity is 0.56, with a p-value of 0.000. This demonstrates that strategic thinking is significantly related to absorptive capacity, and it establishes the nomological validity of the measurement instrument.

Because of the data collection method, there is potential for common method bias in the data. Harman's Single-Factor test is used to investigate common method variance. All 32 items representing strategic thinking and absorptive capacity were subjected to factor analysis to see whether a single factor emerges with more than 50% of the variance explained. Harman's Single-Factor test result (36%) confirmed that common method bias is less likely (Podsakoff *et al.*, 2003).

Table 3
Discriminant Validity

	1	2	3	4	5	6	7
1. Acquisition	0.79*						
2. Assimilation	0.65	0.88*					
3. Transformation	0.61	0.66	0.81*				
4. Exploitation	0.45	0.53	0.56	0.78*			
5. Reflection	0.62	0.53	0.67	0.45	0.83*		
6. Divergent Thought Processing	0.43	0.47	0.54	0.38	0.55	0.72*	
7. Systems Thinking	0.22	0.26	0.22	0.21	0.34	0.64	0.81*

*Square root of AVE shown diagonally

Table 4

Correlation Between Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Strategic Thinking	–										
2. Absorptive Capacity	0.63**	–									
3. Systems Thinking	0.73**	0.24**	–								
4. Divergent Thought Processing	0.88**	0.52**	0.67**	–							
5. Reflection	0.76**	0.67**	0.30**	0.51**	–						
6. Acquisition	0.49**	0.80**	0.15	0.38**	0.57**	–					
7. Assimilation	0.51**	0.89**	0.21**	0.44**	0.51**	0.66**	–				
8. Transformation	0.58**	0.86**	0.17*	0.49**	0.65**	0.61**	0.66**	–			
9. Exploitation	0.41**	0.68**	0.19*	0.35**	0.43**	0.43**	0.53**	0.56**	–		
10. Firm Age	0.02	0.00	0.07	-0.05	-0.01	-0.06	-0.02	0.04	0.03	–	
11. Annual Revenue	0.13	0.05	0.12	0.11	0.05	0.04	0.03	0.08	-0.05	0.34**	–

Table 5
Regression of Strategic Thinking on Absorptive Capacity

	Beta*	t-stats	Significance
Control Variables			
Firm Age	-0.29	-0.06	0.54
Firm Revenue	0.05	1.19	0.23
Independent Var.			
Strategic Thinking	0.56	12.26	0.000
Test Results			
R-Sq	0.32		
F-stats	51.82		

Dependent Variable: Absorptive Capacity
*Standardized beta coefficient shown

DISCUSSION

Scholars have noted that a construct should be defined on "its own merits" rather than what it does in terms of its consequences or outcomes (Dalal *et al.*, 2008). Prior measures of strategic thinking have been found to be lacking on this criterion (see, for example, Graetz, 2002; Goldman, 2007; Heracleous, 1998; Nasi, 1991; Nuntamanop *et al.*, 2013; Struebing, 1996). In this study, the scale development began by defining strategic thinking as a phenomenon that is represented by three cognitive abilities (systems thinking, divergent thought processing, and reflection), and not the consequences/outcomes of these abilities. Accordingly, this approach to instrument development addresses scholarly criticisms of existing operationalizations of the phenomenon.

The Relevance of the Instrument

Despite the importance of strategic thinking in management research, there is limited consensus on a well-accepted measure of the strategic thinking construct (Steptoe-Warren *et al.*, 2011). Existing measures have been found to either lack robustness of scale development or are idiosyncratic to the research context (Goldman and Scott, 2016; Dragoni *et al.*, 2014; Moon, 2013). This study developed and validated a 14-item scale that can be used by management scholars to measure strategic thinking in an organizational context. The increasing evidence of the importance of strategic thinking to achieving organizational goals makes this scale development relevant, valuable, and timely.

Robustness of the Instrument Development Process

Hair *et al.* (2010) note that fine-grained characterizations help translate a latent construct into quantifiable events (item) that appropriately represent the theoretical phenomenon. Hence, the identification of multiple sub-dimensions for each of the three dimensions of strategic thinking serves to improve the operational specificity of the

higher-level construct and provides richer anchors for item development. Further, the systematic approach to the scale development process generated items that, when grouped together, adequately represent strategic thinking at the dimensional level, while simultaneously exhibiting nuanced differences at the sub-dimensional level. Because of the fine-grained articulation at the sub-dimensional level, strategic thinking construct as operationalized in this study is less likely to suffer from definitional reification over time.

A robust operationalization of a construct should be demonstrated through an assessment of construct validity (i.e., does the instrument measure what it is supposed to measure?) (Hair *et al.*, 2010). To achieve appropriate construct validity, a well-accepted procedure is followed to create the measurement instrument.[1] The exercise resulted in a parsimonious 14-item instrument that shows good convergent and discriminant validity. In addition, Hinkin's (1998) cautionary note was followed to confirm the nomological validity of the strategic thinking instrument.

Multi-Field Applicability of the Instrument

Scholars have used several theoretical lenses to explore the role of strategic thinking in organizational contexts. Thus, the measurement scale developed in this study has the potential to impact and extend multiple streams of management research. Because the development of the instrument is anchored in the capabilities of the organization, it offers the potential to support management research that incorporates the direct or indirect influence of strategic thinking on any value-creating action, process, or resource of the organization, and delivers competitive advantage in the marketplace. Some scholars (e.g., Bonn, 2001; Goldman, 2007) have offered theoretical arguments to suggest that in an organizational context, strategic thinking is important enough to be viewed as a core capability of the organization. The capability-centric operationalization of the strategic thinking measurement scale makes it ideal for empirical research aimed at confirming such scholarly contentions. Another direct application of the measurement scale would be in research that links strategic thinking with the actions of managers themselves. For example, the measurement scale could be used in empirical research to support/confirm scholarly characterizations of the relationship between strategic thinking and strategic planning (e.g., Bryson *et al.*, 2018; Phillips and Moutinho, 2018; Nickols, 2016; Graetz, 2002).

Other areas of scholarship that can employ this measurement scale include entrepreneurship, creativity, and organizational innovation. For example, the measurement scale developed in this study can be used to test the relationship between entrepreneurship and strategic thinking proposed by Zahra and Nambisan (2012). Because of the multi-dimensional characterization of this measurement scale, it can also aid in providing a more nuanced understanding of the relationship between strategic thinking and creativity in organizations (e.g., Herrmann-Nehdi, 2017), and it can be employed to expand current views that have limited their focus to design thinking (e.g., Lee *et al.*, 2019; Lloyd, 2013). Further, there is increasing scholarly interest in studying the innovation imperative of modern organizations. Strategic thinking has been

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[1] See, for example, applications of this procedure by Holt *et al.* (2003), Shaffer *et al.* (2016), and Sieger *et al.* (2016).

characterized as a determinant of organizational innovation (e.g., Chen *et al*., 2018; Bouhali *et al*., 2015; Dragoni *et al*., 2014), and this measurement instrument will help drive much needed empirical research to synthesize the multiple streams of scholarly thought that exist on organizational innovation.

Research on the relationship between strategic thinking and organizational change covers several decades and has grown active in recent years (e.g., Goldman *et al*., 2015; Switzer, 2008; Zeffane, 1996). Further, the measurement scale will aid in empirical research in two related areas of scholarly interest – corporate entrepreneurship and corporate survival. For example, the measurement instrument can be used in empirical studies to test the proposed framework for corporate entrepreneurship (Kuratko and Hoskinson, 2018), and corporate survival (Tregoe and Zimmerman, 1980). These are areas where the employment of a measurement scale will aid in providing empirical support and shed new light on the nature of the relationship between these two constructs.

The measurement scale developed in this study can be incorporated in research on phenomena associated with the upper echelons of the organization suggests that senior-level managers are primarily responsible for the selection and deployment of organization-specific resources and capabilities that result in organizational change (Hayden *et al*., 2017; Huber and Glick, 1995). Further, it can be used to support recent research on the relationship between leadership style and strategic thinking (Gross, 2016). Relevant and nuanced empirical investigations that extend the understanding of the relationship between leadership and strategic thinking will be easier to undertake because of the instrument developed herein.

At a more micro-level, the instrument can be used to provide empirical support for, and understanding of the influence of strategic thinking on an organizational phenomenon like opportunity recognition (Hanford, 1995), leadership development (Dragoni *et al*., 2014), team building, and team-based decision-making (Bates and Dillard Jr., 1993; Thomas and McDaniel Jr., 1990). Further, given the fine-grained operationalization of strategic thinking at the dimensional level, it will be interesting to see what happens when researchers empirically test the contributions of each of the dimensions of strategic thinking to strategy formulation and strategic action in entrepreneurial organizations (Baron, 2006).

Finally, the instrument can also be used in a number of behavioral research streams. For example, research on leadership and top management teams can be revisited to empirically test the significance of strategic thinking as an antecedent, a covariate, or an outcome, as hypothesized in prior research (e.g., Bass, 1969; Hambrick and Mason, 1984; Moon, 2013). In the area of HRM, the instrument enables empirical research on the role of work experience, work environment, and professional development on the strategic thinking abilities of managers (Goldman *et al*., 2015). Further, scholars can now empirically test the relationship between individual strategic thinking abilities (i.e., systems thinking, divergent thought processing, and reflection) and personnel workplace effectiveness as recommended by Pang and Pisapia (2012). Further, empirically investigating the relationship between strategic thinking and job-related capabilities of managers is now feasible (Simester, 2016), and researchers can include strategic thinking in empirical investigations on the relationship between capability-role alignment and job satisfaction (Caldwell and O'Reilly, 1990). Finally, the costs and benefits of building strategic thinking capabilities in the organization (Delaney and

Huselid, 1996; Kim and Ployhart, 2014) can be explored fully now that a relevant measurement instrument is available.

LIMITATIONS

As with every research effort, this study has some limitations that readers should be aware of when making inferences based on the results of the study. First, the scale is developed using a capability perspective, and hence it may not be applicable in other contexts. Second, the scale does not include visionary thinking as an element of strategic thinking. Strategic scholars have noted that vision and strategy are distinctly different organizational constructs, and they are in general agreement that management's vision and the thought processes that shape it act as guard-rails to configure their strategic thinking abilities. Therefore, the authors posit that visionary thinking should be characterized as an antecedent of strategic thinking rather than an inherent dimension of the construct. Third, the reader should note that a key-informant approach was used to collect data from managers. Although statistical tests undertaken in the study suggest that the associated biases are not significant and that the results are relevant and robust, readers should consider the limitation and treat them accordingly.

CONCLUSION

Scholars agree that strategic thinking helps managers achieve desired organizational outcomes (Bonn, 2005; Casey and Goldman, 2010; Pang and Pisapia, 2012; Simester, 2016). In this study, a well-accepted methodology is used to develop a valid and reliable instrument to measure strategic thinking in an organizational context. The resulting instrument was tested for nomological validity against another construct, absorptive capacity. The availability of a valid and reliable instrument to measure strategic thinking in an organizational context will open many new research opportunities for scholars in the field of management.

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All submissions must adhere to these requirements. Submissions that deviate from these guidelines may receive desk rejections. If in doubt consult The Chicago Manual of Style.
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Format – Type double-spaced papers with one inch margins, on 8½"x11" paper, using 12 pt. Times New Roman font. Place each figure, table, reference list, and abstract on a separate page; number pages after the first. Cover page should list title and name, position, affiliation, and mailing address of each author. On second page, include title and abstract. Submissions will not be returned.

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- Three or More Authors: Smith, T. J., V. Height, and C. B. Lucas. 1951. *Work Transformed*. New York, NY: Basic Books.
- Article in Book Edited by a Different Author: Mikels, N. D. 1981. "Understanding Entrepreneurship." In *Contemporary Entrepreneurship*. Ed. J. Schick. Ann Arbor, MI: Hanover Press.