



Journal of Managerial Issues



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Send Correspondence to:

Sang-Heui Lee, Editor-in-Chief

Journal of Managerial Issues

Pittsburg State University, 1701 S. Broadway, Pittsburg, KS 66762

E-mail: slee@pittstate.edu

Send submissions to JMI@pittstate.edu

Phone: 620-235-4597 or 620-235-4547

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How to Get Women on Board(s)? The Role of a Company's Female Friendly Culture.....237
Jasmin Joecks

The study analyzes whether having won a working mother award increases the share of female board members in a company. Recently, mandated gender quotas for boards of publicly-traded firms are discussed all over Europe. One of the consequences of mandated gender quotas is a demand increase for female board members. Theoretically, a female friendly culture might serve as an instrument for an increase of women on boards. Having won a working mother award can show a female friendly culture in an organization and therefore increases the percentage of female board members in the subsequent years. Empirically, this hypothesis is supported by using a sample of 199 listed companies in different European countries (Germany, Italy, Sweden, and the United Kingdom) from 2002–2016.

The Relationship between Director Centrality and R&D Investment: High-Tech Firms and Non-High-Tech Firms.....255
Subramanian. R. Iyer, Harikumar Sankaran, and James Hoffman

Many researchers consider large R&D budgets as a means to create stakeholder value. The role of CEOs, along with product development, and patents have been extensively reviewed in firm valuation. Yet few have reviewed the role of board of directors in R&D budget decisions. This paper seeks to add to the literature in this field. In this paper it is posited that a board director's network connections provide access to information related to technological developments, shifts in the market for innovative products, information related to competition, and opportunities for collaboration. An examination of whether research expenditures increase when director centrality increases, such as when a director moves closer to a cluster of directors (perhaps in similar type of firms), and if this increase is higher for high-tech firms is conducted.

Broken Promises: Supervisors and High Performing Work Practices 274
Eric R. Schulz, Alankrita Pandey, and Richaard R. Camp

A strong body of empirical research exists delineating an association between systems of high performance work practices (HPWPs) and organizational performance. However, insufficient attention has been paid to the vital role that supervisors play in implementing these practices. This experimental study involved 320 subjects exposed to varying levels of supervisory support for HPWPs that subjects were promised they would receive and from which they would benefit. Individuals with supervisors who withheld support for some HPWPs responded with greater perceptions of procedural injustice committed against their interests by the supervisor, impressions of lessened managerial support and trust, and a heightened proclivity to behave counterproductively toward the supervisor. Individuals with supervisors who withheld support for all HPWPs responded with greater perceptions of procedural injustice committed against their interests by both the organization and supervisor, and an enhanced tendency to behave counterproductively toward both the organization and supervisor. Implications for future research and practice are discussed.

*Is Audit Committee Expertise Related to Earnings Quality?
Evidence from Germany* 294
Luka H.H. Weber

The purpose of this study is to investigate the influence of audit committee expertise, i.e., the financial knowledge, educational level, and industry background of audit committee members on earnings quality in the German two-tier system. The sampling frame is 610 firm-year observations of German listed firms, from 2007 to 2013. The results of a multivariate regression analysis reveal that higher levels of financial expertise and advanced educational backgrounds of audit committee members are significantly associated with higher earnings quality. Findings suggest that audit committees with greater levels of financial expertise have more specific knowledge and experience in understanding accounting policies as well as better quality in overseeing the financial reporting process. Moreover, results reveal that educational level has positive impacts on audit committee effectiveness as it enables better performance abilities, more rational approaches to decision-making and more alternatives to problem-solving.

Antecedents and Outcomes of Salesperson Internal Customer Mind-Set318
Mark C. Johlke and Rajesh Iyer

Managers are increasingly cognizant of the role of salesperson internal relations as a means to improve both employee and firm outcomes. This study proposes a model of antecedents and outcomes of salespeople’s attitude towards internal relations, i.e., internal customer mind-set (ICMS). Data was gathered from 396 B-B salespeople in India representing 270 firms. The results indicate that managers can directly influence salesperson ICMS by providing them with greater autonomy and feedback and that salesperson ICMS is directly associated with improved performance and satisfaction. ICMS is also directly associated with reduced salesperson sense of ambiguity regarding their external customers.

Advice-Taking in Ethical Dilemmas.....334
Danny Franklin and Amy J. Guerber

This paper explores the impact of individual and situational factors on openness to advice in ethical decision-making. When faced with an ethical dilemma, organizational members may come to rely on social interactions to help interpret the situation and determine acceptable outcomes. Past studies of advice-taking have found that decision-makers are generally more open to advice which they believe will improve the accuracy or quality of their decision and when they believe their decision has important implications; however, previous research has not explored possible differences in advice-taking between ethical and non-ethical decisions. The current study compares the influence of factors which have been found to impact openness to advice in non-ethical decisions (the General Advice-Taking or GAT model) with a proposed theoretical model specifically relevant to the ethical decision-making context (the Ethical Decision Advice-Taking or EDAT model). The results suggest that there are important differences in advice-taking motivations and behaviors in ethical as opposed to non-ethical decisions, and these differences may have important implications for managers seeking to design ethical decision support systems.

How to Get Women on Board(s)? The Role of a Company's Female Friendly Culture¹

Jasmin Joecks
Department of HRM & Organization
University of Tuebingen
jasmin.joecks@uni-tuebingen.de

During the last few decades, there has been a growing public interest in the representation of women on boards (for recent meta-analysis see Kirsch, 2018; Byron and Post, 2016). Recently, there have been intense debates on gender quota laws in European countries (Terjesen *et al.*, 2015). The gender quota laws are designed to foster a growing representation of women on corporate boards. Therefore, many European countries have already enacted fixed gender quotas for corporate listed companies. Since Norway imposed a law in 2003 requiring public-limited companies to fill at least 40 percent of their board positions with women by 2008 (Ahern and Dittmar, 2012), more and more countries have instituted gender quotas for listed companies (Terjesen *et al.*, 2015).

To comply with the law, companies increasingly face the challenge of attracting potential female board members. On the supply side, the pool of potential women for board positions might be limited (Gabaldon *et al.*, 2016; Gregory-Smith *et al.*, 2014; Farrell and Hersch, 2005). Since women in the top ranks were less often promoted in top rank positions (Fernandez-Mateo and Kaplan, 2018), companies may have problems in finding female board members to ensure a fixed gender quota. Although work family practices help to enrich mother's and father's work life structures (e.g., Allard *et al.*, 2011; O'Neil *et al.*, 2008), taking advantage of these practices are framed as women issues, sometimes leading them to opt out of the workforce (Cahusac and Kanji, 2014; Lovejoy and Stone, 2012). As a result, the number of potential female candidates for the boardroom is reduced. On the demand side, recent empirical evidence shows that women representation on boards is often driven by family connections. According to Ahern and Dittmar (2012: 156), the newly appointed female directors in Norway are wives, daughters, or sisters of existing directors. Bianco *et al.* (2015) find similar results

¹ The author gratefully acknowledges funding financed from the Excellence Initiative of the German federal and state governments at the University of Tuebingen ("Athene-Program").

for Italy. Moreover, according to Seierstad and Opsahl (2011), the number of female directors with multiple directorships has almost doubled in the time period from 2003 to 2009, also known as the “Golden Skirts” phenomenon. This suggests that targeting a high share of women on corporate boards by enacting a gender quota does not fully address the underlying causes of female underrepresentation in corporate leadership. Therefore, it is important to have a good understanding of the demand and supply perspective of female representation on boards.

Studies investigating the reasons why directors accept or refuse particular board memberships find that these reasons differ between female and male directors. According to Mohan (2014), one reason for the underrepresentation of women on corporate boards is that a career in a publicly-traded corporation is not attractive enough for women, and they decide against a boardroom position. The resulting question is which factors increase the supply side. The McKinsey study by Desvaux *et al.* (2010) find programs that help to reconcile work and family life are one effective way to achieve a higher representation at the top of European corporations. In sum, potential female board members who have choices about a boardroom position might be more likely to choose companies that support the compatibility of work and family.

An organizational culture that is female friendly might be represented by the fact that a company has won a *working mother* award. The award is given to companies that offer a bundle of family friendly policies such as flexible working times, daycare services, and employee leave. Every year, different magazines such as *Working Mother* or *BusinessWeek* nominate companies based on several criteria of family-friendliness. They take their information from a company’s brochure, website, and its annual report. Only companies that fulfill several criteria of family-friendliness will win a *working mother* award, so the award might be a good portrayal of the company’s culture.

The primary goal of this paper is to analyze if having won a *working mother* award increases the share of female board members in a company using a sample of 199 publicly traded companies in four different European countries (Germany, Italy, Sweden, and the United Kingdom) from 2002–2016. By analyzing the demand and supply perspective, the paper gives new insights for gender parity in the boardroom.

ESTABLISHING THE INSTITUTIONAL CONTEXT – CORPORATE GOVERNANCE STRUCTURES IN GERMANY, ITALY, SWEDEN, AND THE UNITED KINGDOM

According to the literature review by Kirsch (2018), the vast majority of studies investigating women on boards are based on data from the US or UK. Every country has a unique institutional and cultural setting so the transferability of the results to other countries might be questioned. For this study, data by companies operating in Germany, Italy, Sweden, and the United Kingdom is analyzed. Seierstad *et al.* (2017) use a similar set of countries for their investigation of the increasing number of women on boards. The country classification by Evans (2001) and the seminal work of Esping-Andersen (1999) serve as a motivation for choosing these countries. Their work has distinguished four different European welfare states: the Central European model, the Southern European model, the Nordic model, and the Insular model. Germany, Italy, Sweden, and the United Kingdom, respectively, can be seen as prototypical examples of these different welfare states (Evans, 2001).

All countries have some quotas or target to increase the share of women on boards in place, e.g., until 2014 Germany focused on voluntary commitments to increase the share of women on boards. In 2015, Germany agreed on a 30 percent gender quota by 2016 for listed companies with employee representations (Kirsch, 2017). In 2012, Italy also introduced gender quotas on boards. The required threshold of 33 percent had to be fulfilled by 2015 (Rigolini and Huse, 2017). Although there are no mandated gender quotas in Sweden, one might assume that Sweden is indirectly affected by the gender quota as a neighboring country to Norway. The study by Grosvold and Brammer (2011) show some descriptive evidence that since the introduction of mandated gender quotas in Norway the share of women on the board increased drastically in Sweden at the same time. The United Kingdom focus on a voluntary approach to ensure a 25 percent women target in the boards of the FTSE 100 companies by 2015 (Lord Davies Report, 2011). The Hampton Alexander Review (2016) builds on the Lord Davies Report 2011 calling for an increase of the target to a minimum of 33% women's representation on boards by 2020.

In addition, whereas the board system in Germany and in Sweden is co-determined and boards are comprised of members elected by shareholders and by employee representatives, the board system in Italy and the United Kingdom is not co-determined. These four countries represent the historical split between one-tier structures on the one hand (e.g., United Kingdom) and two-tier structures on the other (e.g., Germany) (Hopt and Leyens, 2004). In the one tier board, there are only executive directors and non-executive directors, whereas in the two-tier board there are also employee representatives in the boardroom. However, despite these differences, governmental approaches to increase the representation of women on boards of directors are quite similar in the countries included in the analysis (Terjesen *et al.*, 2015). All countries refer to a higher representation of women on boards in their corporate governance codes; Italy and Germany imposed a law regarding gender quotas by 2015 and 2016, respectively. Therefore, the sample consists of a composite picture of female representation on corporate boards across a wide range of countries in Europe.

RELATED LITERATURE

Previous research has demonstrated the positive effects women might have on the board. Besides ethical and social issues, women bring different abilities, perspectives, and values into the boardroom, which have been shown to potentially enhance performance (for a review, see Joecks *et al.*, 2013; Byron and Post, 2016) or increase the reputation (Bear *et al.*, 2010; Brammer *et al.*, 2009). As noted by Terjesen *et al.* (2009), the vast majority of studies investigating women on corporate boards consider female representation on boards of directors to be exogenous, and focus on the outcomes.

In addition, other researchers have focused on the underlying mechanism why there might be a relation between women on corporate boards and firm performance. Some studies focus on the characteristics of female board members and find women to have a more "questioning attitude" (Huse *et al.*, 2009), a more process-oriented working style (Huse *et al.*, 2005), and furthermore show a women-induced change in board processes such as board development activities and conflict (Nielsen and Huse, 2010; Joecks *et al.*, 2019).

A limited number of studies have shed light on the determinants of a higher female representation on corporate boards. The majority of studies have highlighted the importance of institutional factors such as firm size and industry sector. For example, Hillmann *et al.* (2007) as well as Geiger and Marlin (2012) provide evidence of an impact of organizational size on the likelihood of female representation on boards of directors for U.S. companies. In the European context, Nekhili and Gatfaoui (2013) and Gregorič *et al.* (2017) find a positive relationship between women directors and board size in a sample of French firms and Scandinavian firms, respectively. Referring to the industry sector, the majority of studies find more women on boards in the retail industry than in the STEM and finance industries (e.g., Adams and Kirchmaier, 2016; Geiger and Marlin, 2012; Mateos *et al.*, 2011; Nekhili and Gatfaoui, 2013). Only very recently, the literature highlighted the importance of external actors, board composition, and network ties (e.g., Gregorič *et al.*, 2017; Marquardt and Wiedman, 2016; Doldor *et al.*, 2016; Kaczmarek *et al.*, 2012). The current study ties in this research stream and stresses the importance of a female friendly culture for an increase of the share of women on boards.

HYPOTHESIS

The representation of women on boards can be examined from two different angles: the supply and the demand perspective (Fernandez-Mateo and Kaplan, 2018; Gabaldon *et al.*, 2016; Withers *et al.*, 2012). On the demand side, there are three main tools for higher female representations on boards: (1) the environment, (2) the firm, and (3) the board of directors.

Firstly, due to external pressure by the environment, companies are facing the challenge to promote gender diversity on corporate boards (Iannotta *et al.*, 2016; Seierstad, 2016). Recently, there have been intense debates on gender quota laws in European countries (Terjesen *et al.*, 2015). Many European countries have already enacted fixed gender quotas for corporate listed companies; others have focused on voluntary commitments (Terjesen *et al.*, 2015; Labelle *et al.*, 2015). These binding laws or voluntary regulations are designed to affect the recruiting strategy of the company for their corporate directors (Gabaldon *et al.*, 2016).

Secondly, the culture and the strategy of a firm play an important role for more gender diversity on boards. A common argument is that a barrier for a higher representation of women on corporate boards is that women are excluded due to the organizational culture. One possible explanation for the rather low number of women in corporate management positions is discrimination (Mateos *et al.*, 2011; Mohan, 2014). Discrimination occurs when men are preferred although there are equally qualified women. This purely gender-based separation might take place because of gender stereotypes and prejudiced attitudes. Indeed, most research finds empirical evidence that gender stereotypes and prejudiced attitudes play a role in explaining the low number of women on corporate boards (e.g., Oakley, 2000; Schein, 2007). In order to reduce discrimination and to promote more women into management positions, companies might create a workplace culture where family friendly benefits are supported. The demand side argument is that companies that implement a lot of work-family policies and are rewarded with a *working mother* award might be more inclusive of women and might seek a comparative advantage in recruiting women directors.

Thirdly, the attitudes and values of the incumbent directors play an important role in the recruitment process of potential new directors (Withers *et al.*, 2012). Previous research by Gregorič *et al.* (2017) points out that there is an established elite in the board consisting of traditional male directors who dominate the selection process of new directors. These directors are resistant to too much diversity in the boardroom. Policies to achieve more gender equality in the boardroom might influence key actors to encourage women to board positions. Companies rewarded with a *working mother* award might have more open-minded directors on their board that are inclusive of women.

On the supply side, there might be a limited pool of female candidates for board positions (Gabaldon *et al.*, 2016; Gregory-Smith *et al.*, 2014; Farrell and Hersch, 2005). Women might often voluntarily decide against a corporate management position because they are not attracted to them (Mohan, 2014). Self-selection, in terms of motives, preferences, or self-views, may play an equally important role when it comes to the appointment of women on boards than selection by others. Given a few professional directors, also known as the “golden skirts” that make a living as a non-executive director, they might make choices on which board they want to sit on. According to Seierstad and Kirton (2015: 395), the female experts in their study had up to 14 executive positions and directorships, they complained about a culture where “it is unheard of to cancel a meeting because of a sick child.” Directors described that informal meetings after normal working hours, working late, and socializing events are common and an important element of the job, requiring flexibility on their part (Seierstad and Kirton, 2015: 395). Women directors might not be able to take part in important decisions due to informal discussions taking place outside of the meeting room after these female directors went home to see their families. Given the difficulties of women getting involved in board networks, work-family policies might be of particular importance (Gabaldon *et al.*, 2016). Work-family policies impact career advancement of women and should be supported by workplace culture (Gabaldon *et al.*, 2016). A company that has won a *working mother* award offers gender equality programs and creates a female friendly culture.

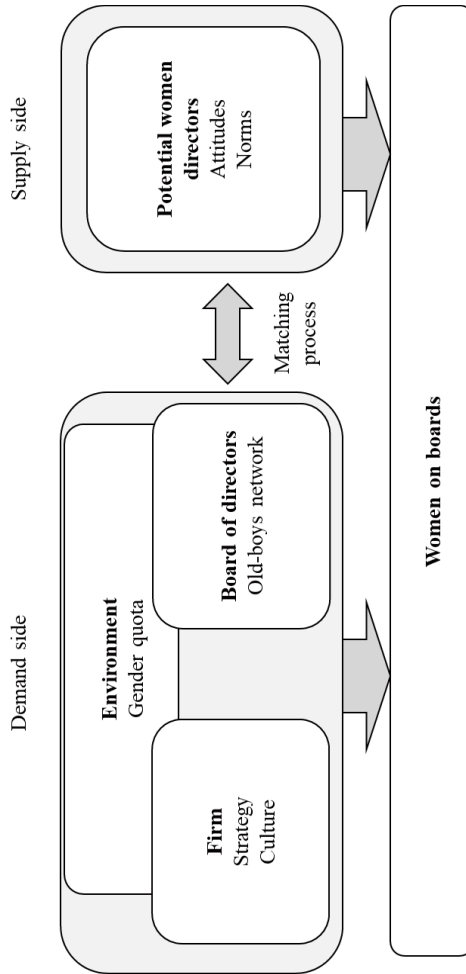
A further argument is that persons are attracted to organizations that share similar values, needs, and preferences (Judge and Cable, 1997). Recent studies show that women have weaker preferences for a competitive environment compared to men (e.g., Catanzaro *et al.*, 2010). Perceived person-organization fit is important for the effective socialization of team members (Braddy *et al.*, 2006). The study by Thomas and Wise (1999) on female and male MBA candidates indicates that female professionals value diversity more highly than males did in their assessments of an organization’s attractiveness. An analysis of interviews with human resource directors of a dozen companies revealed that one of the most effective initiatives to increase women’s participation in the boardroom is to implement measures to facilitate the work-life balance (Desvaux *et al.*, 2007). These studies stress the importance of self-selection of potential female board members to a company that signals a culture congruent with their own preferences. Reversed signaling theory (see e.g., Backes-Gellner and Tuor, 2010) suggests that firms can send signals to recruit and attract potential employees or board members respectively. Such a signal might be the *working mother* award.

In examining the demand and supply side, it becomes apparent that the demand and supply side factors interact with each other and are not independent. Whereas the firm and the incumbent directors represent the demand perspective, the potential

women directors represents the supply perspective. Both perspectives should match to achieve gender parity on boards. The *working mother* award implies a tool for the company's decisions and the incumbent directors as well as the potential female board directors. Figure I summarized the theoretical model. This leads to the following hypothesis:

Hypothesis: Companies that have won a working mother award are more likely to have a higher percentage of women on their corporate boards in the subsequent years.

Figure I
Theoretical model from the demand and supply side for women on boards



METHOD

Sample

The initial sample in this study consisted of an unbalanced panel of 199 listed firms in Germany, Italy, Sweden, and the United Kingdom, which is observed over a 15-year period (2002-2016). In the sample, 30 firms were listed in the German DAX index, 40 in the MIB Italy, 29 in the OMX Stockholm, and 100 in the British FTSE100. Public information for all variables included in the analysis is not available for the 199 listed firms for all years. For the identification strategy, it is highly relevant to use time lags (see below), so the sample finally consists of 151 companies and 1111 observations. There were missing values for the following variables: share of women on board (20.4 percent of dataset), *working mother* award (19.6 percent of dataset), and female managers (54 percent of dataset). The sample suffers a selection bias with respect to companies' size with smaller companies being less likely to provide information for these variables in any public resource.

The data was taken from Asset4, a Thomson Reuters database. This database collects information from publicly available sources such as CSR reports, annual reports, and company websites. Information on the different controls was taken from diverse sources (e.g., Thomson Financial Datastream and firms' annual reports).

VARIABLES

The dependent variable is the share of women on boards. The central explanatory variable is a dummy variable for having won a *working mother* award in a given year. The variable *working mother* award equals 1 if a company has won a working mother award. Companies were nominated for the *working mother* award based on four categories: flexible working time, daycare services, additional maternity leave, and generous vacations. Besides using year, country, and industry dummies, a set of board- and firm-related variables are included that are correlated with the representation of women on boards according to the literature: percentage of female managers in a company (Bilimoria, 2006; Matsa and Miller, 2011); board size (Adams and Ferreira, 2009; Geiger and Marlin, 2012); age of the company (Geiger and Marlin, 2012; Hillmann *et al.*, 2007). A further control is a dummy variable gender quota, taking the value of 1 since the announcement of quota laws in Italy in 2011 and in Germany in 2015, 0 otherwise. The percentage of female managers might be positively related to the share of women on boards because female managers in a company may become potential board members. Board size is measured by the number of members on the board. The size might be positively related to women on boards. Recent empirical literature shows that the larger the board, the higher the share of women on the board (Adams and Ferreira, 2009; Geiger and Marlin, 2012). Regarding age of the company, it might be the case that older companies are less likely to view women as a valuable and needed resource and are less likely to have women on their boards (Geiger and Marlin, 2012). The industry dummies are defined utilizing the nine supersectors of the Global Industry Classification System (GICS). Companies are categorized into one of nine supersectors which are: Basic Materials, Consumer Staples, Consumer Services, Financials, Industrials, Information Technology, Pharma and Healthcare, Telecommunication, and Utilities.

ANALYSIS

In analyzing the impact of having won a *working mother* award on the share of women on boards, the most challenging point is reversed causality. One might argue that female directors are more likely to bring about a change in work-family politics ultimately leading to a *working mother* award. To address potential causality problems, this study uses a panel dataset and lags the central explanatory variable having won a *working mother* award by one year, three years, and alternatively by four years. Using the lag of the explanatory variables helped to identify the direction of causality. Even if it is not possible to fully rule out endogeneity problems for unobservable variables that change over time, by using the FE estimator all unobservable factors that are time invariant are controlled for. Pooled Ordinary Least Square estimator with robust standard errors serves as benchmark estimation. Since firm fixed effects are jointly significant in all estimated models and Hausman tests reject the null hypothesis of no systematic differences with random effects estimates, only the OLS and the FE estimator are presented.

In order to provide consistent effects for the coefficients, the strict exogeneity assumption must hold, i.e., the lagged variables must be strictly exogenous conditional on the independent variables, and the unobserved effects must be uncorrelated not only with the error term in the current period but also in the lagged periods. By incorporating the lead of the endogenous variable in the regression, it is tested for strict exogeneity. Since, the lead of the variable winning a *working mother* award has no significant effect on the share of women on boards, the results of the FE Model are consistent.

RESULTS

Descriptive Statistics and Correlations

Table 1 shows the summary statistics for all variables and correlations included in the analysis at firm-year level. The average share of women on boards is 17.4 percent ranging from 0 to 64 percent and dramatically increased in time from about 7 percent in 2002 to about 28 percent in 2016. There are only a few observations (about 15%) where boards have more than 30 percent women on boards. In Sweden, female board members fill on average 24 percent of all board seats, whereas in Italy female board members only fill on average 10.4 percent of all board seats. In Germany and the United Kingdom, female board representation on average is about 17 percent. Roughly eight percent of the companies have won a *working mother* award. In Italy and Sweden, less than five percent of the companies have won a *working mother* award. In Germany, more than ten percent of the companies, and in the United Kingdom, about seven percent of the companies have won an award. The average share of female managers in a company is 24 percent ranging from 0 to 79 percent. The average share of female managers in a company is highest in Sweden (26 percent) and the United Kingdom (26 percent), followed by Italy (22 percent) and Germany (19 percent). On average, a board consists of about 14 board members ranging from 6 to 28. The age of the company varies from 5 to 326 years. About eight percent of the company observations are affected by the quota law regulation.

As to the industry distribution, more than half of the firms belong to Industrials (23.5 percent), followed by Financials (22.1 percent), and Consumer Goods (12.5 percent). The lowest share of women on boards can be found in Industrials (9.7 percent) and Basic Materials (5.8 percent).

Table 1 also provides the Pearson correlation matrix of the included variables. Regarding the dependent variable share of women on boards and the lagged central explanatory variables *working mother award*_(t-1), *working mother award*_(t-3), and *working mother award*_(t-4), there is a positive and statistically significant correlation ($r=0.15^{***}$, $r=0.15^{***}$, and $r=0.17^{***}$ respectively). This might be a first hint that a *working mother award* increases the share of women on boards in the long run. Additionally, Table 1 shows statistically significant and positive correlations between the dependent variable share of women on boards and the control variable percentage of female managers ($r=0.27^{***}$) and the control variable gender quota ($r=0.25^{***}$). Thus, the percentage of female managers and a quota regulation seems to increase the share of women on boards. As to potential interrelations, the explanatory variable *working mother award* is positively related to board size (0.13^{***}), i.e., larger firms are more likely to win a *working mother award*. There is no correlation with the variable percentage of female managers. In order to test for potential multicollinearity, the variance inflation factors (VIF) are examined. As all VIF values were below 2.89, there is no multicollinearity problem.

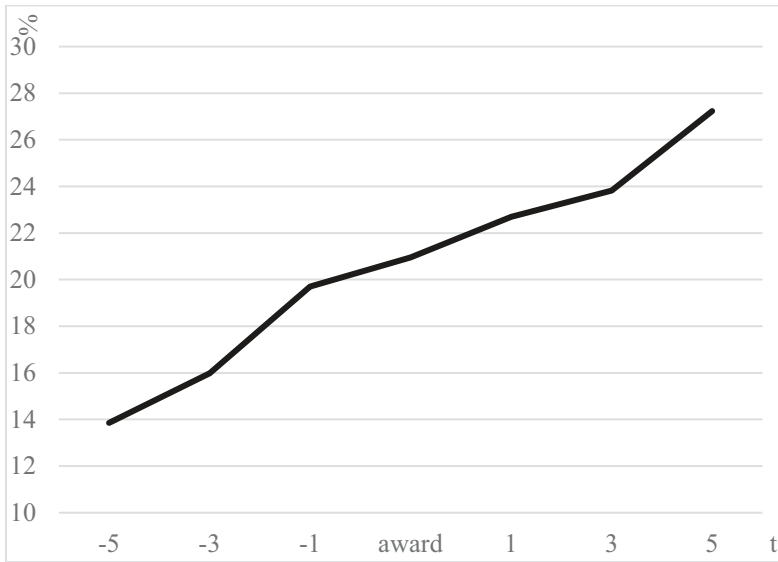
Figure II displays the share of women on boards in the time period of five years before a company has won a *working mother award* and five years afterwards. As can be seen, the share of women on boards increases after having won a *working mother award*. Whereas the graph renders first tentative hints of a positive effect of a *working mother award* on the share of women on boards, the following regression analyses takes further potential time trends and control variables into account.

Table 1
Means, Standard Deviation and Pearson Correlation Matrix

Variables	Obs	Means	Std. Dev	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Women on boards (%)	1111	17.41	11.53	1						
(2) Working mother award (t-1)	1075	0.08	0.27	0.15***	1					
(3) Working mother award (t-3)	954	0.07	0.25	0.15***	0.44***	1				
(4) Working mother award (t-4)	877	0.06	0.24	0.17***	0.37***	0.45***	1			
(5) Female managers (%)	1111	24.14	12.57	0.27***	0.05*	0.09***	0.11***	1		
(6) Board size	1111	13.59	4.09	-0.01	0.13***	0.12***	0.10***	-0.10***	1	
(7) Age of the company	1111	85.21	77.02	-0.01	-0.01	-0.02	-0.02	0.07***	-0.04**	1
(8) Gender quota	1111	0.08	0.29	0.25***	0.06**	0.05*	0.03	-0.07***	0.14***	0.02

Note: *** p<0.01, ** p<0.05, * p<0.1

Figure II
Share of women on boards before and after
the company won a *working mother* award



MULTIVARIATE ANALYSES

Table 2 shows the main results of the OLS and FE estimation with the percentage of females on boards as the dependent variable. As a result of missing values, the study ends up with $n=1081$ observations when lagging the explanatory variable, having won a *working mother* award, for one year, and $n=961$ observations when lagging it for three years, and $n=884$ observations when lagging it for four years. Starting with the controls, depending on the model and the lag, the results are similar to previous studies. The gender quota, the percentage of female managers (Bilimoria, 2006), and board size (Geiger and Marlin, 2012; Nekhili and Gatfaoui, 2013) are positively related to the percentage of female directors on boards.

Table 2
OLS and FE Regression Results

Women on boards (%)	(1) OLS	(2) OLS	(3) OLS	(4) FE	(5) FE	(6) FE
<i>Working mother award</i> _(t-1)	4.124** (2.06)			1.070 (0.69)		
<i>Working mother award</i> _(t-3)		3.916** (2.11)			0.979 (0.93)	
<i>Working mother award</i> _(t-4)			5.142*** (2.68)			2.680** (2.59)
Female managers (%)	0.215*** (3.57)	0.225*** (3.92)	0.234*** (4.27)	-0.00261 (-0.05)	0.0258 (0.43)	-0.000719 (-0.01)
Board size	0.00826 (0.06)	0.0222 (0.16)	-0.0162 (-0.11)	0.169 (1.15)	0.325* (1.77)	0.172 (1.02)
Age of the company	-0.00822 (-1.65)	-0.00678 (-1.31)	-0.00707 (-1.34)	.	.	.
Gender quota	7.423*** (4.30)	7.444*** (4.25)	7.525*** (4.31)	7.045*** (5.03)	6.944*** (5.00)	6.995*** (4.94)
Sweden ^a	12.77*** (5.76)	13.31*** (6.14)	13.46*** (6.09)	.	.	.
Italy	-6.811*** (-4.44)	-6.250*** (-4.03)	-5.845*** (-3.59)	.	.	.
United Kingdom	1.530 (0.85)	2.116 (1.18)	2.168 (1.16)	.	.	.
_cons	5.860* (1.75)	4.625 (1.36)	5.320 (1.59)	25.59*** (9.22)	22.35*** (7.03)	8.742*** (3.08)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm and industry effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>No obs.</i>	1081	961	884	1081	961	884
<i>No groups</i>	151	149	148	151	149	148
<i>R</i> ²	0.51	0.52	0.52	0.23	0.23	0.24
<i>Prob</i> > <i>F</i>				***	***	***
<i>Hausman Test</i>				***	***	***

Note: a reference country is Germany
t-statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The hypothesis suggests that companies that win a *working mother* award are more likely to have a higher share of women on their corporate boards in the subsequent years. The OLS models show positive significant effects of a *working mother* award and female board representation. The FE models with a lag of one year and three years show no significant effect of a *working mother* award on the share of women on boards. In model with a lag of four years, the estimations show a positive effect of a *working mother* award on the share of women on boards. Therefore, concerning the positive linear relation between having won a *working mother* award and women on boards, the regression results partly confirm the hypothesis. Companies that have won a *working mother* award have more female directors on their boards four years later. The positive effect on the share of women on boards for a larger time lag might be explained by the fact that board members are also appointed to a board with a certain time lag, e.g., approximately every four years in the German context (§102, Stock Cooperation Act (Aktiengesetz, 2010)). These findings reflect that the change in particular board compositions needs some time to be influenced by a *working mother* award.

SUMMARY AND DISCUSSION

This paper explores the relation between having won a *working mother* award and the share of women on boards. Empirically, the findings indicate a relation between a *working mother* award and an increased share of women on boards in the long run. Hereby, this study contributes to the question “what is to be done” to increase the number of women on boards. Research so far concentrated on the effects of gender diversity (e.g., Carter *et al.*, 2010; Joecks *et al.*, 2013; Byron and Post, 2016). Little empirical evidence sheds light on the factors that motivate women to serve on a corporate board of a company. Previous literature on gender diversity in organizations highlighted difficulties in overcoming established behavior and traditional views of gender (e.g., Glass and Cook, 2014; Eriksson-Zetterquist and Styhre, 2008). However, in the corporate governance literature the main research focus is on either outcomes of gender diversity (e.g., Byron and Post, 2016; Joecks *et al.*, 2013) or on the characteristics of female board members (e.g., Ruigrok *et al.*, 2007; Burgess and Tharenou, 2002). Only very recently, the research focus addresses the determinants of female representation on corporate boards and focus on the supply and demand perspective of women directors (e.g., Gabaldon *et al.*, 2016; Withers *et al.*, 2012). The current study contributes to this research stream and highlights the importance of a female friendly culture for an increase of the share of women on boards.

In addition, the findings provide support for previous research results that certain organizational variables, such as female managers or board size, have an effect on the female representation of corporate boards. Similar to other studies (e.g., Matsa and Miller, 2011; Bilimoria, 2006) the paper found depending on the model and the specification, a positive relation between female managers and women on boards. Furthermore, larger board size is associated with a higher share of women on boards as previous studies have also shown (e.g., Nekhili and Gatfaoui, 2013; Gregorič *et al.*, 2017).

From an empirical point of view, it is not easy to distinguish between the demand side of companies recruiting and selecting board members and the supply side, concerning the motivation and choices women make when getting offered a board position. It might be interesting to disentangle the demand and the supply side and to

empirically analyze their efficiency in promoting gender diversity on boards. Whereas on the one hand it might be that shareholders demand more gender diverse boards and shape the company's culture, on the other hand it might be that women are more willing to serve on a board with a female friendly culture. Whereas the current study used a panel dataset with lags and tried to identify the direction of causality, further research is needed to disentangle supply and demand side.

Moreover, the *working mother* award as a construct of a company's female friendly culture has its limitations. First, the fact that a company has not won a *working mother* award does not imply that this company does not have a female friendly culture. Only a few companies are chosen by different magazines from a pool of applications voluntarily submitted by companies (Farrell and Hersch, 2005). Second, the award may not fully match with the value a firm sets on female representation on boards or what attracts women to a specific company (Farrell and Hersch, 2005). Key actors at different levels that facilitate or prevent women's access to boards might be of particular relevance. At the business level, shareholders or corporate headhunters might influence board gender composition (Seierstad *et al.*, 2017; Doldor *et al.*, 2016). These actors might be influenced by the corporation and their organizational culture leading to a change in prevailing norms regarding female representation on boards. The organizational culture might have an effect on the extent to which board positions are filled by women. Of particular relevance for the representation of women on boards are female mentors and role models as the study by Durbin and Tomlinson (2014) has shown. They stress the lack of support for female part-time managers and the absence of positive role models for board positions. While findings of the current study provide the first tentative implications for a corporate strategy, they also call for more research in this area.

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The Relationship between Director Centrality and R&D Investment: High-Tech Firms and Non-High-Tech Firms

Subramanian. R. Iyer
Associate Professor of Finance
University of New Mexico
sriyer@unm.edu

Harikumar Sankaran
Professor of Finance
New Mexico State University
sankaran@nmsu.edu

James Hoffman
Dean, College of Business
New Mexico State University
jhoffman@nmsu.edu

Investment in research and development (R&D) is a critical input that fosters innovation and helps position firms in an increasingly competitive environment (Coccia, 2009). Thus, research and development expenditures are vital for a firm to sustain and grow in high-tech industries. Such research-based investment is typically large in magnitude and often provides returns in the long run, depending on barriers to entry. Prior research has indicated that innovation in knowledge-intensive industries (hereafter referred to as high-tech firms) is influenced by investment made in research and development, research partnerships (Hagedoorn and Schakenraad, 1994), strategic alliance networks (Shan *et al.*, 1994; Walker *et al.*, 1997), proximity to other firms in the same industry (Audretsch and Stephan, 1996), proximity to scientists and research institutions (Brown and Duguid, 1991), and technological spillovers (Jaffe, 1986; Qiu and Wan, 2015).

Typically, the CEO of the firm along with the board of directors provides the strategic direction for R&D activities in their firms. When making decisions related to R&D, the board of directors' network connections provides access to information related

to technological developments, shifts in the market for innovative products, information related to competition, and opportunities for collaboration.

Directors may possess many channels of communications due to his or her connections with directors in other firms, thus providing opportunities for more exchange (Degree centrality). Sometimes, a director can serve as a bridge between two distinct network groups of directors. In this context, a director may not directly possess firm-specific information pertinent to a firm but serves as a resource that facilitates making contacts (Betweenness centrality). If a director possesses relatively close ties to outside directors, it makes information/knowledge exchange quicker (Closeness centrality). Finally, there could be instances when a director may not be well-connected with other directors but may have a connection with another director who is very influential because of his/her position in the network. Such a less than well-connected director benefits from his/her contacts (Eigenvector centrality).

In this study it is posited that a board director's network connections provide access to information related to technological developments, shifts in the market for innovative products, information related to competition, and opportunities for collaboration. Specifically, the current study examines whether research expenditures increase when director centrality increases, such as when a director moves closer to a cluster of directors (perhaps in similar type of firms), and if this increase is higher for high-tech firms.

THEORETICAL AND HYPOTHESES DEVELOPMENT

When directors and/or CEOs serve on boards of other firms they form a social network (Canyon and Muldoon, 2006). Pfeffer and Salancik (1978) suggest that a board's social capital can serve as an important conduit to link firms to the outside environment, facilitate access to various resources, and aid in strategy formulation (Haynes and Hillman, 2010). Hillman and Dalziel (2003) view board capital as having human capital (experience, proficiency, and status) and relational capital (connectivity) dimensions. However, extant research on board and/or CEO connectivity has documented mixed results regarding the value of such connections.

One possible reason for these mixed results is that the value of such connections may be dependent on whether the firm with which the board the directors are serving is high-tech or non-high-tech. In the case of high-tech firms, it is important to note that they are not typical firms due to the knowledge-intensive nature of their business. For instance, modern biotechnology is not a discipline or an industry, but a set of technologies relevant to a wide range of disciplines and industries (Powell *et al.*, 1999). One or all the necessary skills needed to compete in biotechnology is not found under the same roof (Powell and Brantley, 1992). Knowledge expands rapidly, and the sources of knowledge are widely dispersed, organizations enter an array of alliances to gain access to different competencies. A central position in the network provides access to both critical information and resources. Centrality sustains old and initiates new R&D alliances.¹

¹ For a discussion on proximity to scientists and research institutions and strategic alliance networks see Brown and Duguid (1991) and Hagedoorn and Schakenraad (1994). Other related papers include Shan *et al.* (1994) and Walker *et al.* (1997).

In a recent study, Helmers *et al.* (2017) examine the effect of interlocks on patenting and R&D spending for publicly traded firms in India. These authors focus on two natural events that provide an exogenous shock: (a) a corporate governance law that requires firms to adjust their board composition, and (b) an exogenous change in Indian patent system that realigns patentability of pharmaceutical and chemical product inventions. They find that board interlocks foster the transmission of new knowledge that allows firms to conduct new research, resulting in more R&D investment.

In the case of high-tech firms, it is important to note that board of directors perform two fundamental roles: monitoring and advising top management in a firm. The importance of each function depends on various characteristics of firms or the context in which they operate (de Andrés and Rodríguez, 2011; Adams and Ferreira, 2007; Coles *et al.*, 2008). There is, however, a tension between the two roles directors play.

Monitoring and Connectivity

From a connectivity and monitoring perspective, extant research on board and/or CEO connectivity has documented mixed results regarding the value of such connections. First, firms with busy boards² are ineffective monitors resulting in weaker corporate governance leading to lower operating performance and reduced market valuation (Core *et al.*, 1999; Fich and Shivdasani, 2006; Kirchmaier and Stathopoulos, 2008). Renneboog and Zhao (2011) corroborate by observing that firms with busy and highly connected boards result in less performance-sensitive CEO compensation. Second, the top management and board of directors could develop cozy relationships compromising the independence and thereby leading to weaker corporate governance. Third, merger deals instigated by highly connected CEOs are more frequent and result in more losses to both the bidder and the resultant entity relative to those proposed by CEOs with fewer connections (El-Khatib *et al.*, 2015). Fourth, lax monitoring could lead CEOs to engage in irrational behavior, which could lead to corporate misbehavior and loss due to expensive litigation. Corporate misbehavior such as option backdating (Bizjak *et al.*, 2009) and accounting irregularities (Chiu *et al.*, 2013) can also be traced back to inter-locked boards and strong connections between CEO and the board.

In contrast, other studies refute the assertion that strong CEO and/or board connectivity leads to value destruction. Directors with multiple directorships have superior access to information, such as current product market trends, to absorb other directors' knowledge, and to hand over this knowledge through their interactions. As a result, better connected directors potentially possess valuable information leading to better monitoring. Fracassi (2016) found that well-connected outside directors increase firm value relative to well-connected inside directors. Larcker *et al.* (2013) show that firms with highly connected directors earn superior-risk adjusted returns. In addition, they find that firms with highly connected directors have better operating performance and better analyst forecast errors. Khatami *et al.* (2014) show that connections between directors of issuing companies and rating agencies result in higher credit ratings. They suggest that personal connections reduce asymmetric information between the rating agency and the issuer thereby resulting in a lower cost of capital through higher credit rating. The influence top management social ties on corporate monitoring is an

² Fich and Shivdasani (2006) define "busy" as directors holding three or more directorships.

empirical issue and perhaps future research will identify situations where such ties will prove as effective monitors more clearly and provide a better understanding as to why it doesn't serve well in other instances.

Advisory Role and Connectivity

A board's advisory role has not received as much attention in the literature. The view that board of directors have a dual role to play was advanced by Pfeffer and Salancik (1978). Faleye *et al.* (2011) find that improvement in monitoring quality comes at a significant cost of weaker strategic advising and greater managerial myopia resulting in diminished corporate innovation. This suggests that the advisory role becomes extremely important in industries or firms that are engaged in R&D. Well-connected leadership, on the other hand, can explain many organizational phenomena such as social capital, knowledge transfer, organizational learning, communication, and leadership and power (Huning *et al.*, 2015). Strong networks provide the CEO and the board necessary expertise, experience, and exposure to fulfill the advisory role. Custódio and Metzger (2013) find that during mergers and acquisitions when the acquirer's CEO has prior experience in the target industry, the acquirer's abnormal announcement returns are between 1.2 and 2.0 percentage points larger than those produced by a CEO who is new to the target industry.

It can be reasoned that the advisory role is more valuable in contexts in which information and knowledge are important to a business (i.e., high-tech industries). In such firms, the directors play a key role in making valuable suggestions aimed at running the business, determining strategy, or interpreting business opportunities (Adams and Ferreira, 2007; Coles *et al.*, 2008). Knowledge-intensive firms engaged in innovation require creativity and information about state-of-the-art technology that can be obtained through seminars, technology shows, university alliances, and other professional (but social) settings. Because the pace of technological development is rapid and the intellectual capital that drives these changes is widely dispersed, organizations enter an array of alliances to gain access to different competencies. A central position in the network provides access to both critical information and resources.

Based on this research, it is theorized that in high-tech firms, R&D expenditures increase as directors occupy a more central position in a network. Specifically, it is hypothesized that:

H1: R&D expenditures in high-tech firms increase as directors occupy a more central position in a network.

In the case of non-high-tech firms, it is theorized the detrimental effects of centrality come into play due to the absence of a need for very connected directors. Specifically, it is hypothesized:

H2: R&D expenditures in non-high-tech firms do not increase as directors occupy a more central position in a network.

METHODS

Data

Director network data for the years 2000-2013 was obtained from the Corporate Board Member Magazine Director Database (BoardMag), which lists directors of companies listed on the NASDAQ OMX Group Inc., NYSE Amex, and NYSE Euronext stock exchanges. This database tracks directors who serve on multiple boards, lists inside/outside board members, identifies key boardroom relations, discovers trends in boards and executive officers, and more. This database is then intersected with COMPUSTAT and observations are included for each director for each firm for every year (director \times firm \times year) resulting in a large sample of 664,300 observations.

Dependent Variables

The dependent variable is R&D expenditures scaled by sales. It is customary in R&D-related research to consider missing values as zeros. This custom is followed, and missing values are set to zero (variable descriptions are in the Appendix).

Independent Variables

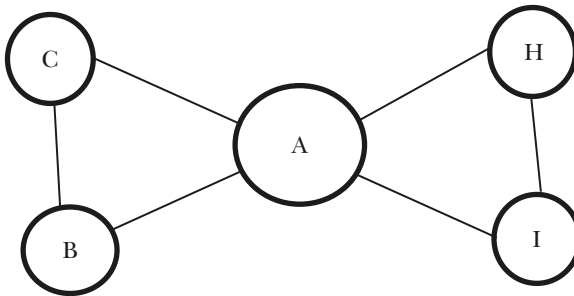
The independent variable of interest is a measure of a director's position in the network aggregated at the board level. A simple network is illustrated in Figure I. The network in Figure I has five nodes (i.e., directors). These nodes are connected by links or edges. An indirect link is defined as a connection between two directors through a common director. For instance, directors B and H are indirectly connected through director A. A direct link is defined as a connection between two directors without the presence of a common director. For instance, directors A and C enjoy a direct connection (Freeman, 1979; Bonacich, 1987). The whole graph, with both direct and indirect connections was completed using the Stanford Network Analysis Platform and Networkit software. Four standard measures of centrality are computed (Degree, Betweenness, Closeness, and Eigenvalue) for each director and each centrality measure is scaled to make it independent of network size. These measures are aggregated by averaging across directors and then ranked by the values in their respective distributions, and the value of the quartile to which the centrality measure belongs is noted. Since each of the centrality measures capture a specific dimension of connectivity, a composite measure denoted by *NSCORE* is computed by first computing the rank of a board's centrality quartile for each measure of centrality, then averaging the ranks across centralities (Larcker *et al.*, 2013).

Figure I
The Network of Directors

This figure depicts the connections between the directors of two companies that share a director.

Firm 1	Firm 2
Director A	Director H
Director B	Director I
Director C	Director A

Direct Connections	Indirect Connections
Directors AB	Directors CH
Directors AC	Directors CI
Directors BC	Directors BH
Directors AH	Directors BI
Directors AI	
Directors HI	



Control Variables

Like the other studies in the literature, the regressions in this paper control for firm characteristics that influence R&D expenditures. These are *Cash*, *Size*, *Firmage*, *Leverage*, *Reverse-Herfindahl index (RHS)*, *R&D Tax Credit*, and *Dividends*. In addition, the influence of a director’s level of connections in a network is distinct from the influence of his or her level of education. However, since the other directors on the board may also possess advanced degrees, the influence of education is controlled for at the board level. Advanced degrees are defined as PhD, MD, Doctor of Science, Doctor of Psychology, and Doctor of Pharmacy. If a board member is identified as the recipient of one of these degrees, it is counted as 1, otherwise it is counted as 0. The variable *Advanced* is measured at the board level by averaging across all directors on a board for each firm every year.³

³ To control for knowledge spillovers, the regressions were estimated using a control for distance between the firm’s headquarters and nearby universities. The results are robust to this control. For the sake of brevity, the results are not included in the paper.

Summary Statistics

Tables 1 and 2 contain the summary statistics of the different variables used in this study. Table 1 contains summary statistics for sales and scaled research and development expenditures for the top five industries in each category ranked on the magnitude of the variables. Table 1 (Panel A) indicates that the total sales of the selected industries listed in the four BLS categories are approximately \$333,936.90m. Among the industries in Table 1, the top ten sorted by sales account for 88% of the total sales. Of the top ten industries, 28% of the sales are accounted for by BLS level-0 industries (non-high-tech), 60% by BLS level-1 industries, and the rest by level-2 and 3 firms.

Table 1 presents R&D expenditures scaled by sales within each industry and BLS category. On a descending sort of the selected industries listed in the table based on R&D expenditures, five out of the ten industries are from BLS level 3. The median scaled R&D expenditures are approximately 14% for the top ten industries and 3.5% for the bottom ten industries, as shown in Table 1. Level 2 and 3 industries spend significantly more on R&D compared to level 0 and level 1 industries.

Table 1
Summary Statistics

This table contains summary statistics for sales and scaled research and development expenditures for the top five industries in each category ranked on the magnitude of the variables. Based on BLS description, this study classifies industries in BLS Level 0 as non-high-tech and BLS Levels 1, 2, and 3 as high-tech industries.

Sales by Industry	N Obs	Mean	Std Dev	Median
INDUSTRY				
BLS Level 0				
Building Material and Supplies Dealers	747	36,344.86	29,899.90	45,738.00
Tobacco Manufacturing	1021	22,066.37	20,112.38	17,663.00
Office Supplies, Stationery, and Gift Stores	505	14,768.87	5,966.36	13,564.70
Other Heavy and Civil Engineering Construction	339	10,901.03	9,825.82	9,380.28
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	383	6,378.52	5,095.19	8,258.93
BLS Level 1				
Motor Vehicle Manufacturing	2,480	76,103.28	75,386.26	52,169.73
Petroleum and Coal Products Manufacturing	6,128	79,372.46	112,606.08	22,284.00
Pipeline Transportation of Natural Gas	2,389	6,388.58	8,364.92	5,249.00
Wireless Telecommunications Carriers (except Satellite)	5,779	21,940.01	31,988.59	4,901.24
Pipeline Transportation of Crude Oil	249	5,448.63	4,750.07	4,482.61
BLS Level 2				
Electric Power Generation, Transmission and Distribution	14,329	6,908.29	7,439.85	4,324.50
Resin, Synthetic Rubber, and Artificial Synthetic Fibers & Filaments Mfg	1,989	12,628.58	16,932.15	2,863.50
Professional and Commercial Equipment and Supplies Merchant Wholesalers	2,884	5,814.92	8,965.99	2,075.15
Basic Chemical Manufacturing	4,995	2,722.29	3,423.95	1,316.90
Manufacturing and Reproducing Magnetic and Optical Media	377	835.40	639.64	937.68
BLS Level 3				
Aerospace Product and Parts Manufacturing	3,886	12,856.13	19,791.44	2,919.00
Data Processing, Hosting, and Related Services	4,013	2,422.65	4,544.34	496.72
Architectural, Engineering, and Related Services	2,040	1,423.68	2,587.13	363.23
Semiconductor and other Electronic Component Manufacturing	26,036	2,064.58	5,141.90	347.01
Computer and Peripheral Equipment Manufacturing	9685	6,547.75	19,618.98	327.56

Table 1 (continued)

Scaled Research Expenditures INDUSTRY	N Obs	Mean	Std Dev	Median
BLS Level 0				
Performing Arts Companies	36	0.1328	0.1033	0.1854
Sound Recording Industries	135	0.1840	0.2539	0.1474
Support Activities for Road Transportation	119	0.0228	0.0163	0.0324
Rubber Product Manufacturing	844	0.0279	0.0545	0.0178
Office Furniture (including Fixtures) Manufacturing	945	0.0165	0.0066	0.0153
BLS Level 1				
Other Information Services	8,694	0.0968	0.1572	0.0684
Medical Equipment and Supplies Manufacturing	11,095	3.0152	58.5629	0.0610
Other Electrical Equipment and Component Manufacturing	3,491	1.1793	7.9817	0.0547
Electrical Equipment Manufacturing	3,005	0.3099	1.0986	0.0391
Motor Vehicle Manufacturing	2,480	0.0461	0.0986	0.0381
BLS Level 2				
Industrial Machinery Manufacturing	4,612	0.1311	0.1028	0.1161
Commercial and Service Industry Machinery Manufacturing	4,433	0.1016	0.1469	0.0641
Audio and Video Equipment Manufacturing	1,093	0.0492	0.0412	0.0454
Resin, Synthetic Rubber, and Artificial Synthetic Fibers & Filaments Mfg Manufacturing and Reproducing Magnetic and Optical Media	1,989	0.0922	0.5159	0.0206
BLS Level 3	377	0.0259	0.0284	0.0163
Internet Publishing and Broadcasting	67	0.4162	0.0805	0.4080
Pharmaceutical and Medicine Manufacturing	40,276	28.73	544.200	0.3638
Software Publishers	25,345	2.3663	96.7184	0.1725
Communications Equipment Manufacturing	12,816	0.5303	7.3219	0.1266
Semiconductor and other Electronic Component Manufacturing	26,036	0.3026	2.0690	0.1253

Table 2 contains the summary statistics of the firm characteristics and R&D expenditures categorized by BLS levels and Table 3 presents the correlation table. Table 2, Panel A indicates that the asset size of level 3 firms is approximately \$5.76b and is significantly smaller than the \$7.1b to \$7.3b of levels 0, 1, or 2. Level 3 firms hold substantially higher levels of cash as a percentage of sales and have a relatively lower level of leverage. Their market-to-book value is higher, at 3.36, relative to approximately 2.5 for the other levels. Overall, findings indicate that level 3 firms have fewer assets in place but greater market-to-book values, indicating that their investors place a significant value on the intangible growth opportunities that are inherent in knowledge-intensive firms. Table 2, Panel B indicates that the mean R&D expenditures among high-tech (non-high-tech) firms is 17.295% (0.474%) of sales. The median R&D expenditures among high-tech (non-high-tech) firms is 3.905% (0%) of sales. The differences in means and medians are statistically significant at the 1% level of significance. High-tech (non-high-tech) firms constitute approximately 48% (52%) of the total number of observations in the sample.

Table 2
Descriptive Statistics

This table contains descriptive statistics of firm characteristics categorized along the BLS description. This study classifies industries in BLS Level 0 as non-high-tech and BLS Levels 1, 2, and 3 as high-tech industries. Panel A presents the averages of the firm characteristics. Panel B contains a more details on the distributional characteristics of R&D expenditures, the number of industries in each category, and the fraction of observations in each category in the sample.

Panel A: Firm Characteristics

Variable	BLS Level=0	BLS Level=1	BLS Level=2	BLS Level=3	High- tech	Non- High-tech
Size (\$b Assets)	7.284	7.1143	7.397	5.76	6.4365	7.2781
FirmAge	12.9402	13.221	14.377	12.1003	12.7348	12.8689
Cash	0.4773	0.3793	0.2233	0.9865	0.6788	0.4767
Leverage	0.6604	0.4934	0.5521	0.3988	0.4561	0.6598
RHI	0.8527	0.863	0.8642	0.9051	0.8851	0.8526
R&DTaxCredit	0.0032	0.0416	0.0067	0.5417	0.3036	0.0031
Dividends	0.0428	0.0238	0.0275	0.0133	0.0190	0.0426
MKBK	2.195	2.8274	2.2624	3.3572	2.9823	2.1878
Advanced	0.0307	0.0465	0.0457	0.1252	1.0364	0.4196

Panel B: Scaled R&D Expenditures

	Mean	Median	Std Dev	No. of Industries	Fraction of observations
BLS Level = 0	0.474%	0.000%	4.369%	188	52%
BLS Level = 1	6.067%	0.794%	19.386%	37	15%
BLS Level = 2	2.817%	0.000%	9.542%	36	8%
BLS Level = 3	28.792%	13.068%	42.754%	14	25%
High-tech	17.294%	3.905%	34.979%	87	48%
Non-High-tech	0.474%	0.000%	4.369%	188	52%
t-stat (High tech vs non-High-tech)	2.80***	512.934***			

Table 3
Correlation Matrix

Variables	Betweenness	Closeness	Degree	Eigenvalue	R&D	MKBK	Size	FirmAge	Cash	Leverage	RHI	R&D TaxCredit
Betweenness	1											
Closeness	-0.0184***	1										
Degree	0.8055***	-0.0540***	1									
Eigenvalue	0.4131***	-0.0057***	0.4163***	1								
R&D	0.0060***	-0.0027**	0.0016	-0.0002	1							
MKBK	0.0360***	-0.0536***	0.0609***	0.0106*	0.0056***	1						
Size	0.1443***	-0.0677***	0.3024***	0.2516*	-0.0131***	-0.0773***	1					
FirmAge	0.1008***	-0.0956***	0.1059***	0.1922*	-0.0094***	-0.0459***	0.2725***	1				
Cash	-0.0164***	0.0104***	-0.0306***	-0.0224*	0.0677***	0.0756***	-0.1304***	-0.1459***	1			
Leverage	0.0129***	0.1028***	0.0658***	0.0605*	-0.0090***	-0.0762***	0.4137***	0.0388***	-0.0811***	1		
RHI	-0.0321***	0.0668***	-0.0231***	-0.0401*	0.0083***	-0.0497***	0.0961***	-0.0793***	0.1668***	0.1437***	1	
R&D	0.0050***	-0.0017	0.0019	-0.0021	0.9398***	0.0040***	-0.0131***	-0.0153***	0.0762***	-0.0138***	0.0124***	1
TaxCredit	-0.0120***	0.0183***	-0.0129***	0.0063*	-0.0045***	0.0058***	0.1617***	0.0011	0.0283***	0.0993***	0.1345***	-0.0028*

Estimation Procedure

This section presents the model that estimates the relationship between board of directors centrality, and the firm's R&D expenditures. The regression equation below estimates the influence of board centrality on R&D expenditures in a firm. The results from the equation are presented in Table 4.

$$\begin{aligned}
 R\&D_{i,t} = & \gamma_0 + \gamma_1 Centrality_{i,t} + \gamma_2 Centrality_{i,t}^2 + \gamma_3 HT_{i,t} * Centrality_{i,t} \\
 & + \gamma_4 HT_{i,t} * Centrality_{i,t}^2 + \gamma_5 Advanced Degree_{i,t} + \gamma_6 Advanced Degree_{i,t}^2 \\
 & + \gamma_7 Cash_{i,t} + \gamma_8 Size_{i,t} + \gamma_9 Firmage_{i,t} \\
 & + \gamma_{10} Leverage_{i,t} + \gamma_{11} RHI_{i,t} + \gamma_{12} Dividends_{i,t} + \gamma_{13} R\&DTaxCredit_{i,t} \\
 & + Industry Fixed Effects + Year Fixed Effects + u_{i,t}
 \end{aligned}$$

The variable *Centrality* is used in a generic manner to denote each of the four director centrality measures. As mentioned earlier, a composite measure is computed for each director and *NSCORE* is denoted as the average of the four quartile measures. The overall influence of board centrality in high-tech firms is estimated by setting *HT* = 1 and combining the coefficients of like variables. Among high-tech firms, the direct effect board centrality on R&D (is estimated by $\gamma_1 + \gamma_3$ and the non-linearity is captured by $\gamma_2 + \gamma_4$). Setting *HT* = 0 would yield the corresponding estimates pertaining to non-high-tech firms. In the context of this equation, Hypotheses 1 and 2 both predict $\gamma_1 + \gamma_3 > 0$. The next section presents the results.⁴

RESULTS

Director Centrality and R&D Expenditures

The results for the influence of board of directors centrality on R&D expenditures are presented in Table 4. Consider the first regression model that tests the composite value of board centrality, i.e., *NSCORE*. All the coefficients on *NSCORE* are statistically significant at the 1% level. For non-high-tech firms, $\gamma_1 = 0.0113$, and for high-tech firms, $\gamma_1 + \gamma_3 = (0.0113 - 0.0012) = 0.0101 > 0$. The results for the individual dimensions of centrality are as follows:

Betweenness:	non-high-tech: $\gamma_1 = 176.68 > 0$;	high-tech: $\gamma_1 + \gamma_3 = 419.01 > 0$
Closeness:	non-high-tech: $\gamma_1 = 0.7869 > 0$;	high-tech: $\gamma_1 + \gamma_3 = 0.1719 > 0$
Eigenvalue:	non-high-tech: $\gamma_1 = 13.81 > 0$;	high-tech: $\gamma_1 + \gamma_3 = -0.07 < 0$

⁴ Endogeneity is an important issue that requires attention in empirical research on corporate governance. Directors being more central in a network can result in greater research expenditures. However, firms that make research expenditures could potentially attract well-connected directors to their boards. A two-year lagged R&D variable is used as the dependent variable and found that there is no statistically significant relationship between prior years' R&D and director centrality.

Table 4
Regression Results

This table presents regression results estimating the impact of board of directors centrality on R&D expenditures. Scaled R&D expenditures is the dependent variable and director centrality is the independent variable of interest. The control variables include firm age, reverse Herfindahl Index, scaled values of cash, size, leverage, dividends, and R&D tax credit, industry and year fixed effects, and robust standard errors clustered at the firm level. ***, **, and * denote 1%, 5%, and 10% significance, respectively.

VARIABLES	CENTRALITY VARIABLES					EIGENVALUE
	NSCORE	BETWEENNESS	CLOSENESS	DEGREE		
CONSTANT	0.1500***	0.1119***	0.1533***	0.1339***		0.0928***
CENTRALITY	0.0113***	176.6824***	0.7869***	258.3949***		13.8148***
CENTRALITY ²	-0.0006***	-589,132.387***	-1.2846***	-547,544.4453***		-1.106.8621***
HT*CENTRALITY	-0.0012***	242.3323***	-0.6150***	-80.7003***		-13.8816***
HT* CENTRALITY ²	0.0013***	-206,998.4992	0.8927***	45,561.5313***		1,110.3323***
ADVANCED DEGREE	0.0249***	0.0264***	0.0258***	0.0253***		0.0291***
ADVANCED DEGREE ²	0.0035***	0.0034***	0.0035***	0.0035***		0.0033***
CONTROLS	All	All	All	All		All
Observations	38,629.00	38,629.00	38,629.00	38,629.00		38,629.00
R-squared	0.723	0.7211	0.7232	0.7232		0.7203
F test model	163.7	157.00	156.00	156.90		156.30

The above results indicate that the primary effect of higher centrality is to increase the R&D expenditures in non-high-tech firms more than in high-tech firms in all dimensions except betweenness. Mere association with influential directors in other firms increases R&D expenditures only in non-high-tech firms. Overall, these results indicate that R&D expenditures in high-tech firms and non-high-tech firms increase as directors occupy a more central position in a network.

A non-linear term was also included in the equation. The results for the non-linear term in the equation are presented in Table 4. The overall effect of NSCORE on R&D expenses for non-high-tech firms is $0.0113*NSCORE-0.0006*(NSCORE)^2$. The non-linear effects of centrality on R&D expenditures is illustrated in Figure II by examining a range of centrality values around its mean after setting the values of the other variables in equation (1) at their respective means.

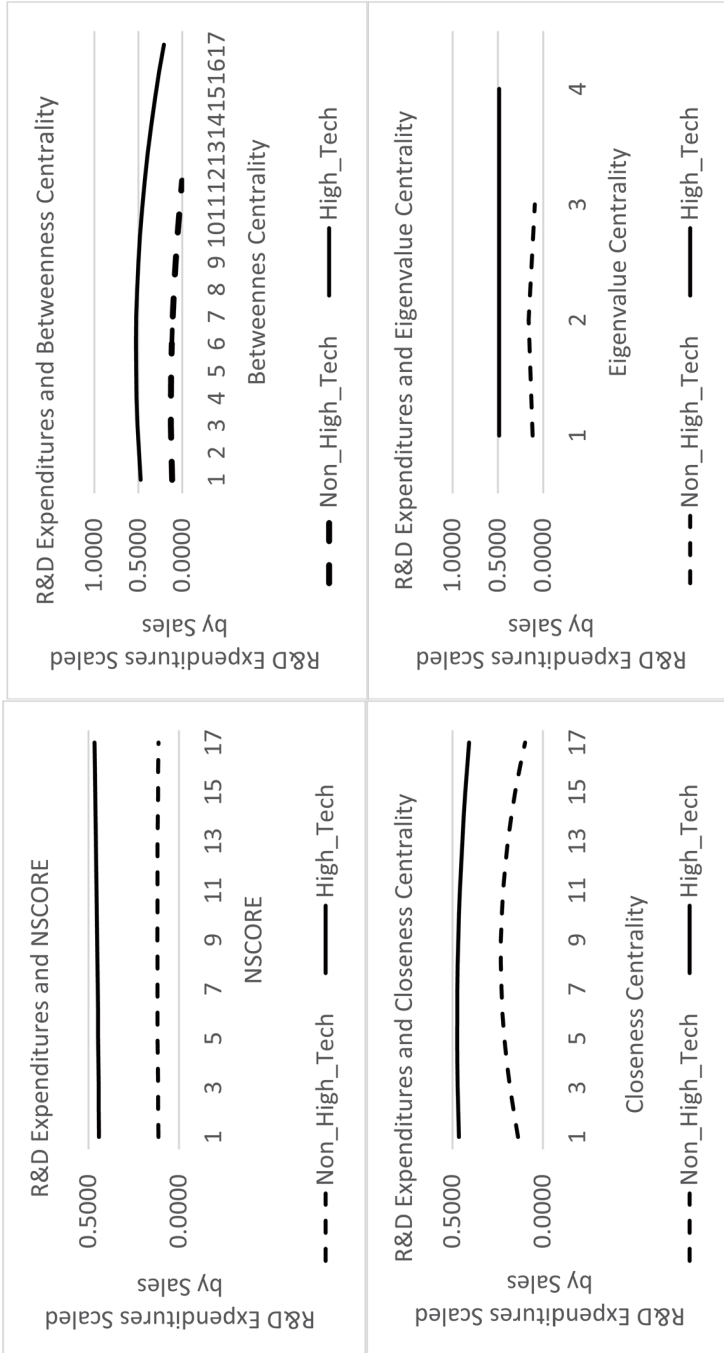
Although the primary effect of centrality as measured by NSCORE is lower for high-tech firms, results in Figure II show that the R&D expenditures increase at an increasing rate relative to non-high-tech firms. Furthermore, although the primary effect of centrality on R&D expenditures is positive for non-high-tech firms, the R&D expenditures decrease beyond a threshold of centrality. Although, both types of firms benefit from directors serving as a nexus between clusters of similar firms (Betweenness), the R&D expenditures for non-high-tech (high-tech) firms decline (increase) as directors become more central. Closeness centrality influences the R&D expenditures in non-high-tech and high-tech firms in a similar manner. Finally, Eigenvalue centrality positively influences the R&D expenditures in high-tech firms but not in non-high-tech firms.

DISCUSSION

In this paper the research on board of director characteristics is extended to empirically examine whether the boardroom network formed by shared board directorates among similar firms have an impact on research and development investment and consequently shareholder value. Using a large set of firms in the US for the period 2000-2013 and measures from social network theory, the influence of director centrality on a firm's research and development expenditures is examined.

Findings from the current study make the following contributions to the literature. Results indicate that R&D expenditures in both high-tech and non-high-tech firms increase as directors occupy a more central position in a network. Additionally, both non-high-tech and high-tech firms experience increases in R&D expenditures when directors are positioned as a bridge between two or more clusters of firms (i.e., high betweenness centrality). Typically, this type of centrality increases patent activity (Powell *et al.*, 1999). The R&D expenditures in non-high-tech firms (high-tech firms) decrease (increase) significantly when their boards of directors are merely associated with other influential directors (i.e., high eigenvalue centrality). Results from the current study enhance understanding of the nuances of relational capital in a broader setting.

Figure II
R&D Expenditures and Board of Directors Centrality



Limitations and Future Research

Results from this study provide a guide to match firm type with director type. Specifically, it is important for a firm to discourage directors who attempt to entrench themselves in such directorships. Additionally, directors who are interlocked with other firms add value only if such associations are motivated by research collaborations. High-tech firms benefit from having directors who are associated with other influential directors. In contrast, such directors add marginal value in non-high-tech firms. Furthermore, results from the current study suggest that the CEOs of high-tech firms would best serve shareholders' interests if they seek representation from directors who are connected to a broad group of directors within the same industry or who serve as a bridge between two or more firms in the same research-related clusters.

Like any research, the current study also has some limitations. Considering that the sample in this study consists of every director, for every firm, for every year in the sample, it is highly likely that the same director appears multiple times within the same year in the statistical analysis. For instance, if the example in Figure 1 occurred in a specific year, director A will appear once in Company 1's observation and the same director will appear in Company 2's regression. Although it is true that director A potentially influences both firms' R&D expenditures, including director A multiple times causes a bias in the number of observations in favor of such directors.

Considering Figure 1 again, the network algorithms and network theory suggest that because of the interlocked nature of director A, there are links between directors B and H, B and I, C and H, and C and I. Technically, there is a connection among directors on the same board; however, the nature of the relationship is not known. For instance, if A has no contact with any other director in the firm except during board meetings, it is not necessary for B and C to have an indirect relation with the directors in company 2. The network statistics, however, blindly count these as links.

One way to minimize the problem mentioned above is to examine whether directors have social ties outside the board of director network. For instance, if director A is a member of the same country club or Rotary club as director B but not C, then it is more likely that B will have stronger indirect links with directors H and I compared to director C. In such instances, the algorithm can be modified to account for indirect links conditional on the presence of non-employment social ties. Westphal, Boivie and Chng (2006) examine whether top executives maintain informal ties with executives at other firms to manage uncertainty arising from resource dependency. Their study shows that CEOs with more resource dependency are more likely to reconstitute their ties. Future research can extend this study to include informal ties and contrast the "quality" of formal versus informal ties in the context of network analysis.

The current study also does not account for the "strength" of director connections. It is likely that an association between directors X and Y in the year 2000 is not the same as an association between X and Z in the year 2015 if director Y has not been in contact with X since 2000 but X has been interacting with Z more often since 2012. Any informal ties between Z and any of X's associates in 2015 are "stronger" than the ties between Y and X's associates in 2015. The network properties in this study are not sensitive to the differences links based on the length of association.

Appendix

Variable	Definition	Source
Centrality Measures		
BETWEENNESS	The number of shortest paths connecting two directors, flowing through a specific director, scaled by the total number of paths connecting the two directors	BOARDMAG
CLOSENESS	The inverse of the sum of shortest paths connecting a specific director to all directors in the sample	BOARDMAG
DEGREE	Total number of connections of a director scaled by total number of directors in the entire sample	BOARDMAG
EIGEN	Normalizing constant value of the matrix of importance that a specific director is connected to	BOARDMAG
NSCORE	Average of the rank of the quartile values of the centrality measures	BOARDMAG
Firm-related variables		
CASH	Cash and cash equivalents scaled by sales	COMPUSTAT
FIRM AGE	Calculated per existence in COMPUSTAT	COMPUSTAT
LEVERAGE	Ratio of long-term debt to total assets	COMPUSTAT
MARKET-TO-BOOK	Ratio of market value of total equity to book value of equity	COMPUSTAT
R&D	Research and development expenditures scaled by sales	COMPUSTAT
RHI	Reverse Herfindahl index calculated as one minus the 2-digit NAICS Herfindahl index	COMPUSTAT
SALE	Sales	COMPUSTAT
SIZE	Log of total assets	COMPUSTAT
R&D TaxCredit	Tax rate multiplied by scaled R&D expenditures	COMPUSTAT
ADVANCED	Board level average of an indicator variable for a board director's advanced degree	BOARDMAG

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Broken Promises: Supervisors and High Performing Work Practices

Eric R. Schulz

Professor

Eastern Michigan University
eschulz@emich.edu

Alankrita Pandey

Associate Professor

Eastern Michigan University
apandey@emich.edu

Richaurd R. Camp

Professor

Eastern Michigan University
rcamp@emich.edu

Wide support indicates that systems of high performance work practices (HPWPs) successfully promote organizational objectives (Ulrich *et al.*, 2012). Past research has associated HPWPs with augmented firm productivity, improved organizational customer service, lessened turnover levels, and greater profitability (Jiang *et al.*, 2012). Along with these positive organizational results, research has linked HPWPs to enhanced levels of employee engagement, organizational commitment and trust (Kehoe and Wright, 2013).

Despite three decades of theoretical development and empirical research outlining an association between HPWPs and performance, further understanding of the environment where these practices are implemented is needed (Evans and Davis, 2015), particularly the influence and role line management plays in implementing HPWPs within an organizational context. While recent management trends such as the quality movement and lean manufacturing principles have thoroughly examined and delineated the role line managers serve in the ultimate success or these programs' failure (Green *et al.*, 2010; Anwar, 2000), scant research has examined the filtering role managers of employees play in implementing HPWPs by organizations.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

HPWPs are typically arrayed as a bundle of collaborative HR work practices reinforcing organizational strategy (MacDuffie, 1995). Past studies identified HR practices constituting HPWPs as including discriminating staffing systems, comprehensive workforce training, career development opportunities, and reward systems acknowledging and compensating superior performance (Ahmad and Schroeder, 2003). The resource-based view of the firm proposes that HPWPs produce enduring arrangements of successful competitive advantages for a firm by enhancing its workforce's human capital skills (Barney, 1991). These practices work in unison to advance an organization's employees' skills and motivation (Chen and Huang, 2009). Employees also benefit from HPWPs in the enhancement of human capital skills typically associated with greater career opportunities and higher compensation.

Researchers argue that past studies exploring the link between configured HR practices and employee behaviors and attitudes toward these initiatives overlooked the essential role immediate supervisors perform in applying these procedures (Wright *et al.*, 2003). Organizations employing managers who use HPWPs in a consistent and coordinated fashion gain beneficial organizational outcomes through these policies' collective reinforcement (Bowen and Ostroff, 2004). Conversely, HPWPs' impact on employee or firm performance will be blunted if line managers purposely choose to avoid fully implementing these policies in the strategic and purposeful way intended.

For several reasons, managers may knowingly elect not to pursue implementing an organization's system of HPWPs or perhaps selectively implement components. Managers may not understand why the systems (or certain parts of it) work, or they may be insufficiently versed by the organization in how to initiate these practices. Additionally, some managers might view these practices as usurping their role or going against their own theories of what best motivates workers, or managers may feel they lack adequate time or other resources to introduce some or all of these practices (Renwick, 2003). For example, some managers might feel they lack the time to study how they hire new employees or differentially reward current ones or to provide detailed feedback needed by the system. Similar to the classic leniency or harshness errors in performance appraisals, managers might wish to avoid components of or even the entire system, feeling it stimulates conflict by treating employees differently (Kromrei, 2015). Further, the organization may not provide acceptable incentives needed to motivate managers to initiate these HR policies. Finally, managers may refuse to implement these HR policies as an act of willful resistance to advance their own status.

When implementing HPWPs, most organizations divide responsibilities among upper management, the HR department, and operating managers (Sikora and Ferris, 2014). While the HPWPs' strategic planning generally occurs within upper management's and HR's purview, these concurrent practices' actual operational execution typically rests on the immediate supervisor. Significant coordination and skill are necessary when effectively administering HPWPs intended by the organization to work in a complementary fashion (Becker and Huselid, 2006). Consequently, because of their accountability in coordinating and implementing these policies, line managers play an outsized role in these HPWPs' success. Managers are often granted considerable latitude in the implementation of HR practices particularly in decentralized work environments where decision-making typically devolves to lower-level management

(Malone, 2004). Management support for particular HR practices the organization intends to implement as part of a system of HR policies fluctuate, leading to greater or lesser backing for these practices (Op de Beeck *et al.*, 2015). The organization's failure to provide the supervisor with adequate direction, suitable resources, and training needed to implement these practices can easily lead to a disconnect between an organization's intentions and pledges to its employees for HPWPs and its actual inception.

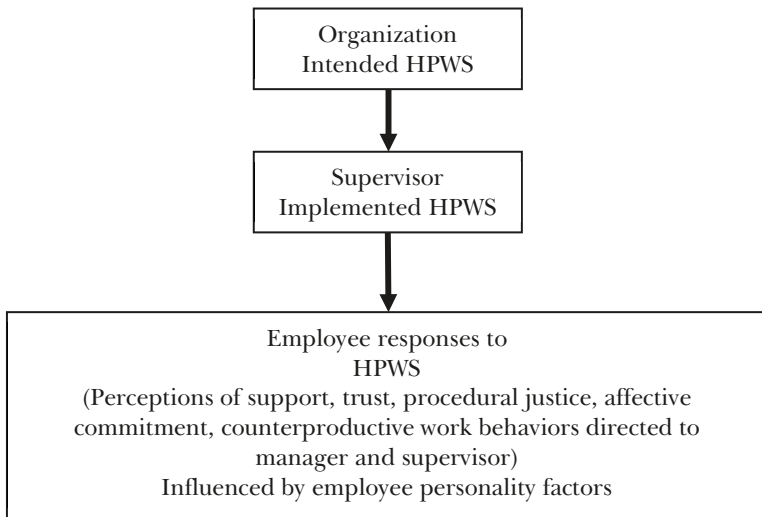
Supervisors have direct responsibility for conveying to subordinates the firm's policies and objectives. Consequently, employees perceive managers as voicing the firm's intentions and comprehend that the supervisor's mandates, assessments, and mentoring duties are discharged to further the organization's goals. The management literature is rife with examples of individual HR practices in the training (Bunch, 2007), performance management (Moynihan, 2008), and employee selection areas (Highhouse, 2008) that, while intended to further organizational goals, are undermined due to poor managerial execution. This impairment typically occurs because the organization fails to involve or adequately prepare supervisors to execute these complex HR policies, or the supervisor disregards these procedures and relies on his/her own intuition or past tactics for addressing personnel matters.

As the principal point of organizational contact for employees, supervisors occupy a position in which they can enact promises in exchange for performance requirements. This transactional form of leadership is necessary in establishing organizational and supervisory trust for the employee and generating employee engagement (Whittington and Galpin, 2010). Employees who are engaged by their supervisor function at high levels when performing in-role tasks outlined in their job descriptions and also engage in extra-role behaviors beyond their job expectations by engaging in positive organizational citizenship behavior (Whittington *et al.*, 2017).

Employee personality also can play an important role in determining employee reactions to supervisory behaviors. Research has demonstrated the moderating impact of employee personality on the relationship between supervisor mistreatment and employee responses (Burton and Hoobler, 2011). These factors include locus of control (Mitchell and Ambrose, 2007); tolerance for ambiguity (Randolph and Posner, 1981); and psychological capital (Mishra *et al.*, 2019). Prior research has also demonstrated that employee personality moderates individual perceptions of justice (Colquitt *et al.*, 2006), citizenship behavior (Organ, 1994), and counterproductive work behaviors (Mount *et al.*, 2006).

The theoretical relationship between the organization's intent to implement HPWPs, supervisory behavior and employee perceptions and responses to them can be illustrated in the theoretical model depicted in Figure I.

Figure I
Theoretical Framework



Perception of Trust and Supervisor Implementation of HPWPs

Supervisors can make promises regarding HPWPs or renege on pledges made by the organization, and thus potentially lead employees to create attributions about the supervisor and organization's veracity. Scholars have linked employee trust in immediate supervisors to numerous consequences including job satisfaction, affective commitment, and perceptions of supervisory support as well as perceptions of organizational veracity (Gomez and Rosen, 2001). Organizational trust is defined as a psychological condition manifested by an employee's willingness to accept vulnerability at the organization's hands based on that employee's expectations of future favorable and advantageous organizational actions towards him/her (Zaheer *et al.*, 1998).

Familiarizing employees to an organization is most critical during the employee onboarding process. Onboarding is the procedure for acquainting a new employee with both the employee's job as well as the organization's goals, values, and practices (Watkins, 2016). Bauer's (2010) model of onboarding notes that this orientation process provides employees with an overview of the organization's culture and impressions of the organization's formal and informal rules during the onboarding process. By their actions, direct supervisors play a particularly critical role in delineating values of the organization to new hires during the onboarding process (Rosenberg, 2009). The perceptions employees form as they are acclimated within a firm during the onboarding process establishes a psychological contract between the organization and employee underscoring the mutual responsibilities of both parties (Caldwell and Peters, 2017).

A supervisor's failure to support any aspect or parts of the HPWPs system clearly signals to employees a lack of commitment to all or some aspects of the culture and values of the organization. This lack of support for following organizational promises and providing the potential positive outcomes for employees from HPWPs also signal

that the supervisors' capability to partially apply the practices has the potential to lead to future restrictions from the supervisor or even the practice's elimination. This raises the distinct possibility that if a supervisor chooses to eliminate or not follow some HR practices, little can prevent him/her from neglecting to implement other valued work practices. The previous discussion leads to the following hypotheses:

Hypothesis 1: Employees who perceive a lack of support and the withholding by their manager of any HPWPs the organization promised will respond with lower perceptions of managerial support relative to employees whose managers support all these practices.

Hypothesis 2: Employees who perceive a lack of support and the withholding by their manager of any HPWPs the organization promised will respond with lower perceptions of managerial trust relative to employees whose managers support all these practices.

Perception of Support and Supervisor Implementation of HPWPs

Because they can animate enthusiasm and opportunities among their subordinates, line managers greatly affect employee perspectives and comportment. Employees derive their attitudes regarding the fairness of their working relationship with their employer from supervisors. Organization support theory stipulates that employees closely observe the ministrations received from supervisors as indicating their worth from the standpoint of both the supervisor and organization (Eisenberger *et al.*, 1986). The failure to assure that employees receive all or any HPWP rewards by their supervisor's actions can also send employees the message that they are not worth the effort needed to implement the system. These arguments suggest the following hypothesis:

Hypothesis 3: Employees who perceive a lack of support and the withholding by their manager of any HPWPs the organization promised will respond with lower perceptions of affective commitment toward their managers relative to employees whose managers support these practices.

Perception of Procedural Justice and Supervisor Implementation of HPWPs

An organization's promises of employee skill-enhancing HPWPs affect employees' attitudes, behavior, and commitment toward that firm. Psychological contracts concern assumptions of what employees perceive their organization owes them. If an organization either fails to produce or reneges on promised specific experiences deemed positive to the employee's work experience, it can create an impression of a breach of a psychological contract for that individual (Rousseau, 1989). Such a breach occurs when the circumstances and conditions of a mutual exchange between the employee and firm are disjointed and one party concludes the other declines to meet his/her promised portion of the pact. Presumably, employees who believe that a pledged organizational reward has been denied them will sense that a personal contract between the employees and organization has been unduly violated.

An employee's perceptions of procedural fairness lead to such desirable outcomes as greater organizational commitment and citizenship behaviors, but impressions of

procedural and distributive injustice arouse an individual's negative attitudes and behaviors against the organization and its representatives (Kickul, 2001). Employees who notice variance between presumptions about work and their unmet expectations attempt to rectify this discrepancy in ways suggesting a broken relationship. Employees should therefore respond with a lessened sense of obligation and commitment to their employer (Rhoades *et al.*, 2001). This leads to the following hypothesis:

Hypothesis 4: *Employees who perceive a lack of support and withholding by their manager of **any HPWPs** the organization promised will respond with higher perceptions of procedural injustice directed toward their manager relative to employees whose managers support these practices.*

Counterproductive Work Behaviors and Supervisor Implementation of HPWPs

Social exchange theory asserts that employees who see a lack of fairness in their employment dealings will respond negatively toward what caused that perceived wrong (Blau, 1964). Employees can blame the failure to effectuate their part of a psychological contract on the immediate manager or the firm in general. Employees generally associate cases of procedural injustices with supervisors because of supervisors' importance in conveying resources (Tepper *et al.*, 2006).

When employees deem managers trustworthy and fair, they may generalize this trust to the overall organization because they comprehend managers as operatives of the firm (Hales, 2005). Yet, employees understand that while supervisors serve as organizational representatives, they are separate actors as well who behave distinct from the firm (Jiang *et al.*, 2017). The variance in perceptions an individual holds of the similarity in beliefs and conduct of his/her employer and supervisor impacts the degree to which the employee will generalize his/her view of the equity of transaction relationships from his/her manager onto the entire firm. An individual holding divergent attitudes about the fairness and treatment received from the immediate organization and supervisor may judge his/her exchange relationship with each autonomously (Stinglhamber and Vandenberghe, 2003). Consequently, employees may consider one party, such as the organization, to be just and reasonable in its dealings with employees, while considering another party, the supervisor, unfair and unreasonable (Lavelle *et al.*, 2007). When employees perceive a manager as disassociated from the beneficial principles and values espoused by and enacted by an organization, they will assess that manager as functioning in his/her own interests rather than as the firm's delegate. Employees thus respond with behaviors detrimental to the supervisor. This leads to the following hypothesis:

Hypothesis 5: *Employees who perceive the withdrawal by their manager of **any HPWPs** the organization promised will respond with counterproductive behavior directed at the manager relative to employees whose managers support all these practices.*

Employees faced with unfulfilled organizational promises have to determine whether culpability for this failure resides with the supervisor, the organization, or both. Research has found that employees who encounter discrepancies between the employer's promises and what they actually receive do not hold their employer

accountable for this divergence and remain committed to and satisfied with their employer so long as they receive a partial rendering of what they expected. When employees receive none of the organization's pledged promises, they hold the employer responsible and experience dissatisfaction and anger with that firm (Montes and Zweig, 2009). Individuals will realize more extreme and negative outcomes if they ascribe a schism in a psychological contract to intentional renegeing (Van den Bos *et al.*, 2001). Consequently, when employees ascertain that either a supervisor and/or the organization has deliberately misled them about beneficial work outcomes they were led to expect in return for inputs the employees provided, the ensuing attitudinal and behavioral reactions toward the party held accountable will be severe and intense. This leads to the following hypotheses:

Hypothesis 6: Employees who perceive the withdrawal by their manager of all HPWPs the organization promised will respond with higher perceptions of procedural injustice directed at both the manager and organization relative to employees whose managers support all these practices.

Hypothesis 7: Employees who perceive the withdrawal by their manager of all HPWPs the organization promised will respond with counterproductive behavior directed at both the manager and organization relative to employees whose managers support all these practices.

METHOD

Participants

An experiment performed to test this study's hypotheses, involved 320 undergraduate students from five sections of an introductory management class (53.7% men) at a large Midwestern public university. The sample was predominantly young with 73 percent below age 25, while 15.5 percent ranged between 26 and 34. Approximately 41 percent of the subjects had no work experience, while a nearly equal percentage (42.55%) had some work experience ranging from one to three years. Roughly 86 percent of the sample majored in some aspect of business, with the largest segment (29.5%) majoring in management.

Procedure

Individuals were randomly assigned to one of eight experimental conditions. Each experimental condition represented a unique combination of varying supervisory support for three HPWPs: training, pay for performance, and career development. In each experimental condition, subjects first provided demographic information.

Subjects assumed the role of a newly hired employee of a company in each participant's area of specialization. Participants then watched a five-minute orientation video welcoming new employees to this company during an onboarding process that emphasized the high value the company held of its workforce as well as its commitment to provide HPWPs in the areas of (1) training (i.e., job-based training initiatives, individualized job instruction, evaluation of training effectiveness); (2) pay for performance (i.e., incentive pay that recognized and rewarded employee performance

through higher pay increases for superior performance); and (3) career development (i.e., identification of promotional paths, increasing autonomy, job rotation) for every employee. The orientation video included three testimonials from current company employees substantiating their exposure to these HPWPs and how the practices enhanced the quality of their work experience there. The orientation video closed by explaining that subjects would shortly be introduced to their direct supervisor to whom the company gave considerable leeway in the implementation of work practices. To reduce potential threats to internal validity, the same person portrayed the supervisor in each video. Each video's narrative was identical except for the supervisor's stated rationale and level of support for company practices.

A second video then featured the immediate supervisor. The content for each of the eight experimental conditions differed concerning the direct supervisor's level of support for each of the three HPWPs the company outlined. Except for differences in the supervisor's pronounced support for the various HR practices, each video's content was standardized across all eight conditions. The range of experimental conditions included every potential permutation of supervisory support ranging from complete supervisory support for the three high performance HR practices to a total absence of supervisory support for any.

After the second video, participants completed another survey which measured their targeted perceptions of procedural justice, perceptions of support and trust, affective commitment, and propensity to engage in counterproductive behaviors directed at the organization or their direct supervisor. Examining each variance of supervisory support for these HR practices allowed investigation into the role of level of supervisory support for promised receipt of HR practices and support for combinations of HR practices in influencing employee perceptions of justice, support, trust, and affective commitment. It also allowed investigation of the participant's propensity to engage in counterproductive behaviors directed at the organization or supervisor.

Measures

Perception of Procedural Justice. Subjects' perceptions of how fairly the organization and manager treated them were assessed by adapting three items from Niehoff and Moorman (1993) to fit the study's context. Using a five-point Likert-type scale with endpoints ranging from "strongly disagree" to "strongly agree," subjects responded to three items. To assess supervisory justice, the organization's name was replaced with the manager's name. Items were averaged to form overall scores for the scales. The scales' reliabilities were high ($\alpha = 0.818$ for the perception of procedural organizational justice and $\alpha = 0.888$ for the perception of procedural managerial justice).

Perception of Support. Subjects' perceptions of managerial support were assessed through three items by Eisenberger *et al.* (2002). The measure was a five-point Likert-type scale (with endpoints ranging from "strongly disagree" to "strongly agree"). The scale's reliability for the perception of managerial support was $\alpha = 0.887$.

Perception of Trust. Perception of managerial trust was measured by three items adopted from the Robinson (1996) scale. A five-point Likert-type scale ranging from "strongly disagree" to "strongly agree" was used. The measure had a high reliability ($\alpha = 0.894$).

Perception of Affective Commitment. Affective commitment was assessed using Allen and Meyer's (1990) eight-item scale. A five-point Likert-type scale ranging from

“strongly disagree” to “strongly agree” was used. The measure had a high reliability ($\alpha = 0.894$).

Propensity to Engage in Counterproductive Work Behavior. Information for this area was gathered from the scales used by Jones (2009). Data regarding the work counterproductive to the organization was measured using four items from the Organizational Deviance Scale (Bennett and Robinson, 2000) and three items from Skarlicki and Folger (1997). Subjects responded on a five-point Likert-type scale. The scale had high reliability ($\alpha = 0.897$).

Counterproductive work directed at the manager was measured from five items derived from the Organizational and Interpersonal Deviance Scales (Bennett and Robinson, 2000). Subjects rated these five items on a five-point Likert-type scale. The reliability of this measure was also high ($\alpha = 0.834$).

Control Variables. Since the sample was completely randomized, demographic variables did not serve as controls. However, previous research has demonstrated the impact of personality factors as moderators to justice effects (Colquitt *et al.*, 2006). Personality factors have also been found to impact citizenship behavior (Organ, 1994) and counterproductive work behaviors (Mount *et al.*, 2006); therefore, the study used validated scales to control for the personality variables “psychological capital” (Luthans *et al.*, 2007), “tolerance for ambiguity” (Budner, 1962), and “locus of control” (Levinson, 1981).

Psychological Capital. Psychological capital was assessed through a 24-item scale developed by Luthans *et al.* (2007). These questions covered the subscales of self-efficacy, hope, optimism, and resilience. Subjects rated these 24 items on a six-point scale (1 = “strongly disagree,” 6 = “strongly agree”). The measure’s reliability was high ($\alpha = 0.811$).

Tolerance for ambiguity. Five questions were employed to assess tolerance for ambiguity, using a scale of 1 (“strongly agree”) to 5 (“strongly disagree”) (Budner, 1962). These questions displayed acceptable reliability ($\alpha = 0.735$).

Locus of Control. Cronbach’s alpha coefficient assessed the internal consistency reliability of the locus of control using five questions with a scale of 1 to 5 (1 = “almost never,” 5 = “almost always”) and revealed an acceptable reliability standard ($\alpha = 0.695$). A higher average indicated an external locus of control, and a lower average indicated an internal locus of control. The scale was drawn from Levinson (1981).

Since the variables were calculated on different scales, data were converted to their z-scores, and all analyses performed on this standardized data. Table 1 presents correlations and descriptive statistics.

Groups: Data were collected from 320 subjects across eight groups representing the eight conditions of practices supported by the supervisor: “all supported” coded “A” (n = 45); “only training supported” coded “T” (n = 32); “only career development supported” coded “C” (n = 40); “only pay for performance supported” coded “P” (n = 27); “training and career development supported” coded “TC” (n = 36); “training and pay for performance supported” coded “TP” (n = 39); “pay for performance and career development supported” coded “PC” (n = 46); and “none supported” coded “N” (n = 40).

Table 1
Descriptives and Correlations

	N	M	SD	1	2	3	4	5	6	7	8	9	10
Tolerance for Ambiguity	322	0.001	0.659	(0.735)									
Psychological Capital	322	-0.001	0.433	-0.419*	(0.811)								
Locus of Control	321	0.000	0.720	0.329**	-0.286**	(0.695)							
Perception of Managerial Support	320	0.000	0.903	0.121*	0.023	0.107	(0.887)						
Perception of Managerial Trust	320	-0.001	0.908	0.120*	0.033	0.114*	0.777**	(0.894)					
Affective Commitment for Manager	320	0.001	0.872	0.102	-0.014	0.057	0.695**	0.639**	(0.894)				
Perception of Procedural Justice from Organization	321	0.003	0.861	-0.037	0.140*	0.008	0.233**	0.265**	0.238**	(0.818)			
Perception of Procedural Justice from Manager	320	0.000	0.904	0.125*	-0.020	0.022	0.740**	0.688**	0.585**	0.279**	(0.888)		
Counterproductive behaviors directed to Organization	319	-0.002	0.787	0.014	-0.106	0.075	-0.464**	-0.516**	-0.410**	-0.182**	-0.455**	(0.897)	
Counterproductive behaviors directed to Manager	318	-0.001	0.781	-0.048	-0.122*	0.102	-0.339**	-0.353**	-0.238**	-0.085	-0.342**	0.554**	(0.834)

Note: **p < 0.01; * p < 0.05

Manipulation Checks: The manipulation checks consisted of three questions asking if the supervisor supported training, pay for performance, and career development respectively. MANOVA was used to test if the researchers' manipulations were effective. The results revealed that the eight groups differed in their responses to the three manipulation questions and were consistent in the expected direction of the manipulation (Pillai's Trace = 0.575, $F [1, 819] = 9.25, p < 0.001$).

Common Method Variance Checks: Following past research recommendations (Podsakoff *et al.*, 2003), Harman's single factor test was performed to assess common method variance. No single factor emerged that accounted for a majority of covariance among the independent criterion measures. In addition, the survey was separated in two forms utilizing different scale endpoints to help ameliorate potential anchoring effects and method bias.

RESULTS

MANCOVA Analysis

Hypothesis testing used MANCOVA analysis. Grouping data based on the number of supervisor-supported HR practices resulted in four groups: (1) "All three HR practices supported" (A, $n = 45$); (2) "Two HR practices supported" (2P, $n = 121$); (3) "A single HR practice supported" (1P, $n = 99$); and (4) "No HR practices supported" (N, $n = 40$).

The hypotheses that supervisor's support for HR practices promised by the organization was significantly related to participants' perception of managerial support ($R^2 = 0.181; p \leq 0.05$) and managerial trust ($R^2 = 0.109; p \leq 0.01$) was supported. The manager's support for HR practices was related to the participants' affective commitment directed to the manager ($R^2 = 0.094; p \leq 0.01$). Managerial support for HR practices pledged by the organization was also found to be positively related to perceptions of procedural justice directed to the organization ($R^2 = 0.064; p \leq 0.01$) and the manager ($R^2 = 0.183; p \leq 0.01$). The manager's lack of support for HR practices promised by the organization was related to the propensity to engage in counterproductive behaviors directed to the organization ($R^2 = 0.069; p \leq 0.01$) and supervisor ($R^2 = 0.102; p \leq 0.01$) (Pillai's Trace = 0.234, $F [21, 918] = 3.763, p \leq 0.01$). Table 2 shows these results.

Post-hoc Bonferroni comparisons showed significant differences between varied conditions of managerial support of organizational practices. Perceptions of managerial trust differed significantly between the A and N conditions (mean difference = 1.141; $p \leq 0.01$); the A and 1P (mean difference = 0.854; $p \leq 0.01$); the A and 2P (mean difference = 0.428; $p \leq 0.05$); the 2P and N conditions (mean difference = 0.713; $p \leq 0.01$); and the 2P and 1P conditions (mean difference = 0.426; $p \leq 0.01$). Thus Hypothesis 1 was supported. Specific permutations of HR practices partially supported by supervisors made no appreciable difference relative to the number of practices the supervisor supported.

Table 2
Differences Between Dependent Variables

Dependent Variable	Sum of Squares	df	F	sig	R ²	Adjusted R.
PMS	39.47	3.00	19.14	0.00	0.18	0.17
PMT	20.28	3.00	8.94	0.00	0.11	0.09
MAC	19.30	3.00	9.13	0.00	0.09	0.08
OPJ	9.48	3.00	4.45	0.00	0.06	0.05
MPJ	43.11	3.00	20.97	0.00	0.18	0.17
OPCWB	10.29	3.00	5.81	0.00	0.07	0.05
MPCWB	12.77	3.00	7.60	0.00	0.11	0.09

Note: PMS = Perception of Support from Supervisor

PMT = Perception of Trust from Supervisor

MAC = Affective Commitment directed to the supervisor

OPJ = Organization Procedural Justice

MPJ = Supervisor Procedural Justice

OPCWB = Propensity to engage in Organization directed counterproductive behavior

MPCWB = Propensity to engage in Supervisor directed counterproductive behavior

df = degrees of freedom

sig = significance

Similarly, Hypotheses 2 and 3 were supported. Findings showed that the perceptions of managerial trust differed between the A and N conditions (mean difference = 0.806; $p \leq 0.01$); the A and 1P conditions (mean difference = 0.681; $p \leq 0.01$); and the 2P and N conditions (mean difference = 0.415; $p \leq 0.05$). Affective commitment directed to the supervisor differed significantly among the A and N (mean difference 0.855; $p \leq 0.01$); the A and 1P (mean difference 0.577; $p \leq 0.01$); and the 2P and N conditions (mean difference 0.511; $p \leq 0.01$).

Hypotheses 4 and 5 were supported as well. Divergence of managerial support for HR practices the organization promised demonstrated differences in perceptions of organizational procedural justice. There were significant differences between the A and N (mean difference 0.580; $p \leq 0.01$) conditions. Perceptions of procedural justice directed at the manager differed significantly between the A and N conditions (mean difference 1.139; $p \leq 0.01$); the A and 1P conditions (mean difference 1.001; $p \leq 0.01$); the A and 2P conditions (mean difference 0.546; $p \leq 0.01$); the 2P and 1P conditions (mean difference 0.455; $p \leq 0.01$); and the 2P and N conditions (mean difference 0.593; $p \leq 0.01$).

Likewise, findings supported Hypothesis 6 affirming that individuals whose supervisors withheld support for all promised HR practices would manifest greater perceptions of procedural injustice directed at both their supervisor and organization relative to employees whose managers supported these practices. Finally, results supported Hypothesis 7 stating that individuals whose supervisors withheld support for all promised HR practices would engage in more counterproductive work behavior targeted at the organization relative to individuals whose supervisors support these initiatives. There was a significant difference between the A and N conditions (mean difference = -0.504; $p \leq 0.05$), and the A and 1P conditions (mean difference = -0.497;

$p \leq 0.01$). Counterproductive work directed at the supervisor also demonstrated significant differences between the A and N conditions (mean difference = -0.621 ; $p \leq 0.05$), and the A and IP conditions (mean difference = -0.562 ; $p \leq 0.01$).

Table 3 presents the *post hoc* Bonferroni differences by dependent variable.

Table 3
Significant *Post Hoc* Comparisons

DV	Pairs	Mean Difference	Std. Error	Sig	95% CI	
					Lower	Upper
PMS	A-N	1.141*	0.178	0.000	0.668	1.614
	A-IP	0.854*	0.147	0.000	0.463	1.245
	A-2P	0.428*	0.146	0.022	0.040	0.816
	2P-N	0.713*	0.147	0.000	0.324	1.103
PMT	2P-IP	0.426*	0.112	0.001	0.128	0.724
	A-N	0.806*	0.187	0.000	0.310	1.302
	A-IP	0.681*	0.154	0.000	0.272	1.091
MAC	2P-N	0.415*	0.154	0.044	0.006	0.823
	A-N	0.855*	0.180	0.000	0.376	1.334
	A-IP	0.577*	0.149	0.001	0.182	0.973
OPJ	2P-N	0.511*	0.149	0.004	0.116	0.905
	A-N	0.580*	0.181	0.009	0.099	1.060
MPJ	A-N	1.139*	0.178	0.000	0.667	1.611
	A-IP	1.001*	0.147	0.000	0.611	1.391
	A-2P	0.546*	0.146	0.001	0.159	0.933
	2P-IP	0.455*	0.112	0.000	0.158	0.753
OPCWB	2P-N	0.593*	0.147	0.000	0.204	0.982
	A-N	-0.504*	0.165	0.015	-0.943	-0.066
MPCWB	A-IP	-0.497*	0.136	0.002	-0.859	-0.135
	A-N	-0.621*	0.161	0.001	-1.048	-0.194
	A-IP	-0.562*	0.133	0.000	-0.915	-0.210

Note: ** $p < 0.01$; * $p < 0.05$

A = all three HR practices supported

IP = only one Practice supported

2P = only two Practices supported

N = none supported

OPJ = Organization Procedural Justice

OPCWB = Propensity to engage in Organization directed counterproductive behavior

MPCWB = Propensity to engage in Supervisor directed counterproductive behavior

sig = significance

PMS = Perception of Support from Supervisor

PMT = Perception of Trust from Supervisor

MAC = Affective Commitment directed to the supervisor

MPJ = Supervisor Procedural Justice

DISCUSSION

This study examined whether a supervisor’s divergence of support for some or all the pledges of mutually beneficial HPWPs an organization made to new employees would lead to reduced perceptions of support and trust toward both the supervisor and organization. It also examined if such divergence of supervisory support would provoke counterproductive work behavior from workers targeted at either the supervisor or organization. The study’s findings support the hypothesis that individuals whose

supervisors dissent from actively supporting the exposure of individuals to any high performance HR practices the organization promised to employees will evince greater perceptions of procedural injustice. Supervisors who renege on assurances to individuals of positive employment experiences made by the organization fail to behave in ways the organization espouses creating perceptions of procedural injustice. In instances where the supervisor suspends support for the delivery of all HPWPs the organization promised to subordinates, these workers responded with significantly higher perceptions of procedural injustice directed at both the supervisor and organization.

The study's results indicate support for the hypotheses that employees with supervisors choosing to neglect to discharge some of the HPWPs the organization pledged react with significantly lower perceptions of both managerial support and trust relative to individuals whose supervisors embrace these practices. The study's findings also suggest that subordinates directed by supervisors who withhold support for the operationalization of any HPWPs the organization pledged respond with greater interest in engaging in counterproductive behavior directed at their manager relative to employees whose managers support all these practices. Only in cases where a manager resisted imparting all HPWPs the organization promised to workers did employees react with a heightened inclination to engage in counterproductive behavior directed at both manager and organization.

Notably, perceived procedural injustices the organization commits against individuals and employees' penchants to engage in counterproductive behavior counter to the organization's interests arose only when a supervisor refrained from supporting all HPWPs the firm committed to employees. The organization was left unaccountable for recrimination by employees in instances where supervisors disavowed backing for some but not all HPWPs the employers promised employees. Employee perceptions of injustice, lowered trust, and a proclivity to engage in counterproductive behavior emerged and were directed solely at the supervisor when workers were informed they would receive only a portion of expected benefits.

These findings suggest that organizations possess some immunity from employee condemnation and retribution when supervisors deny procuring some HPWPs promised to subordinates, but continue offering support for a portion of these practices. Despite a supervisor's failure to provide a promised benefit to an employee, employees apparently believe the organization behaves with rectitude toward them because they still receive some of the expected promised positive work experiences. Under this framework, employees may regard supervisory restraint from granting HPWPs intended for their constructive benefit as a manager's capricious act independent of the organization's aims. Employees told by their supervisor that they will receive only a portion of the anticipated HPWPs may give the organization the benefit of the doubt expecting the organization has their longstanding interest at heart. This study's results suggest if organizations become aware of situations where these types of benefits have been withheld, they may need to move quickly during their "grace period" to regain employee trust and commitment. This study's results also suggest that organizations electing to implement HPWPs might need to monitor not only the results of these practices on traditionally measured outcomes such as job satisfaction, motivation and performance, but also on employees' perceptions of the implementation process.

Workers perceiving an organization as highly auspicious may regard an initial supervisor who seemingly arbitrarily withholds some HPWPs the firm promised as only

a short-term irritant requiring brief toleration before eventual advancement removes the employee from that supervisor's sphere of control. However, when a supervisor fails to support all HPWPs promised to employees, these individuals hold both the supervisor and organization responsible for this omission. Under these circumstances, it appears that employees consider the organization's promises about their employment conditions to be false and that supervisors acting as organizational agents convey the reality of their working environment. This evaluation likely leads the employees to conclude he/she is the victim of a misrepresentation of the job setting, thus leading to a breach of a psychological contract resulting in the perception of procedural injustice committed against him/her by the organization. In this context, employees experience a heightened interest in striking back against both the supervisor and organization by behaving in counterproductive ways.

These findings suggest that despite the absence of immediate beneficial effects the study's participants received from the promise of obtaining HPWPs, the anticipation of getting these benefits is associated with a *de facto* psychological contract about expected positive work experiences. Strong empirical support exists in the literature demonstrating the positive effect that the implementation of HPWPs has on both the employee and organization. Increasingly, though, scholars suggest that successful execution of these complex programs requires line management's significant coordination and cooperation. These findings bolster the burgeoning acknowledgement among scholars that past research examining the consequences of the implementation of high performance HR practices overlooked the key role that line managers perform in delegating these practices.

These results suggest that organizations intending to implement HPWPs should ensure that supervisors are engaged and committed to the process of applying these practices and expressing support for their application. Supervisors who fail to assent to a greater organizational strategy centered upon these HR policies can undermine employees' attitudinal and behavioral dispositions toward both the supervisor and the overall organization. In this study, these antagonistic emotions appeared as lowered trust, counterproductive work behaviors, and employee perceptions of procedural injustice. A manager who provides conflicting information regarding an organization's overall strategy might be perceived as a bad leader who does things that are negative for his/her workers and for the organization. In their meta-analysis of 53 studies on bad leadership, Schyns and Schilling (2013) note that poor leaders are associated with a wide range of employee counter-productive work behaviors that estimates suggest cost organizations 23.8 billion dollars yearly (Tepper, 2007).

This study's findings appear to have the most reverberation for those in organizations employing decentralized reporting relationships. Decentralized formations offer individual managers more discretion in generating decisions releasing higher management to concentrate on vital initiatives. Decentralized organizational structures delegate decision-making duties to lower level managers and supervisors giving them greater power and independence. Decentralized arrangements provide supervisors more autonomy in construing organization procedures, improvising operational decisions, and exerting organizational influence (Rondinelli and Nellis, 1986). These decentralized systems afford supervisors malleability in interpreting the viability of organizational strategies and wide flexibility in whether they choose to champion or diverge from these strategies while leading their employees (Darvishmotevali, 2019).

While decentralized firms proffer heightened adeptness in freeing higher management from performing daily operations, decentralizing creates greater complications for firms seeking to assume a collective business strategy due to its promotion of independence in decision-making for first-line supervisors. Higher management in decentralized firms seeking to benefit from HPWPs would especially need to express these practices' worth to first-line management. As a result, both higher and lower management must similarly comprehend the possibilities these HR practices possess due to the prominent part that immediate supervisors perform in governing decentralized firms.

Even in instances where supervisors are inclined to administer the strategic HR practices begun by upper-level management, organizations need to be mindful of the need to adequately prepare and motivate lower management when initiating these aggregated practices. HPWP systems are complex work combinations requiring significant understanding and coordination. Immediate supervisors' lack of readiness or motivation in effectuating HPWPs to their subordinates can unintentionally generate employee perceptions of procedural injustice, lowered organizational and supervisor trust, and detrimental worker behavior toward both the organization and supervisor. Organizations can help insure lower-level supervisors' adherence to these policies by providing adequate training to supervisors about implementing HPWPs and by creating effective incentive systems that reward them for their successful application.

Limitations of the findings and ramifications of these results exist. One investigational limitation is the use of students as an information source; this may limit its generalizability to employment backdrops. However, the utilization of purposeful employment orientation practices like those affected in this laboratory study are specifically targeted at an organization's new hires including new workforce arrivals. From this vantage, a student sample may justifiably approximate the attributes of those workers who would be normal beneficiaries of new hire orientation programs. Further, scholars have established that using students as subjects is suitable when examining behavioral constructs because students often manifest pluralistic attitudes embodied in the general society (Gordon *et al.*, 1987).

A further limitation of this study is that the method for examining the role that managerial support plays in the application of HPWPs was the administration of a laboratory experiment instead of an authentic employment setting. The simulated quality of a laboratory experiment inhibits the generalizability of the results of this study. However, one compensation for the absence of generalizability of laboratory experiments is that the random allocation of subjects to experimental conditions allows contention of a cause and effect relationship. The dearth of studies exploring supervisory support for HPWPs utilized in earlier investigations is even more pronounced due to the scarcity of laboratory controls permitting depiction of a cause and effect relationship.

In conclusion, these results indicate that managerial support for the execution of HPWPs pledged to a new hire performs a key function in developing the attitudes and behaviors these workers maintain toward their supervisors and organizations. In instances where supervisors withhold some HPWPs the organization pledges to employees, individuals respond with feelings of procedural injustice, perceptions of lowered supervisory commitment and trust, and intentions to engage in counterproductive behavior directed against this supervisor. In extreme cases where the supervisor withholds support for all HPWPs the organization promised, perceptions of

procedural injustice and an impulse to engage in counterproductive behavior are directed against both the supervisor and organization. Organizations can aid supervisors' efforts to discharge HPWPs by articulating the practices' centrality to its goals, unambiguously communicating goals concerning these practices, and granting supervisors with the time and materials needed to inaugurate these actions.

Future scholarship would gain from evaluating the influence the lack of managerial support for HPWPs has on existing workers to test whether these findings are evidenced in employment surroundings. Future researchers possessing access to employees can build upon this study to the work sphere to further define the role of supervisory support on the disposition of HPWPs.

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Is Audit Committee Expertise Related to Earnings Quality? Evidence from Germany

Luka H. H. Weber

PhD Student

Leuphana University of Lüneburg
luka.weber@leuphana.de

Various management decisions such as aggressive earnings management and ineffective monitoring activities have contributed to financial accounting scandals and a lack of confidence of shareholders and other stakeholders in financial reporting quality (Jiang *et al.*, 2010). To address these issues, regulators have aimed to prevent unacceptable management behavior, increase transparency (Ghafran and O'Sullivan, 2013), and generally improve corporate governance quality (Nguyen *et al.*, 2015). Consequently, firms have begun to pay more attention to corporate governance quality factors, and boards of directors have been charged with specialized monitoring tasks and responsibilities (Bajra and Cadez, 2018). The implementation of an effective audit committee is considered essential for driving professionalism in this context (Velte, 2017). Although audit committees are not mandatory in the German two-tier system, due to increasing board sizes and the growing number of monitoring tasks and due diligence expected of the supervisory board, most German listed firms have them (Albersmann and Hohenfels, 2017). Audit committees are primarily responsible for monitoring the financial reporting process and constraining aggressive earnings management by implementing efficient controlling activities (Zgarni *et al.*, 2016). They tend to create opportunities for and set limits concerning boards' self-organization, and increase external auditors' conservatism (Inaam and Khamoussi, 2016; Carcello *et al.*, 2011). More effective audit committees have been shown to increase earnings quality in particular and corporate governance quality in general (Aldamen *et al.*, 2012; Baxter and Cotter, 2009). Specifically, in addition to size, independence, and meeting frequency, expertise (e.g., financial expertise, educational level, and industry background) has been found to be an important characteristic of these committees' effectiveness in monitoring the financial reporting process (Ghafran and O'Sullivan, 2017; Cohen and Hoitash, 2014; He and Yang, 2014).

With higher monitoring and legal requirements and increasing reporting complexity, audit committee members with high levels of financial and industry

expertise and educational background, i.e., members who have the right kinds of qualifications and experiences to oversee management's financial reporting practices, tend to improve financial reporting quality (Kusnadi *et al.*, 2016; Nelson and Devi, 2013). Financial expertise in particular has been found to be associated with a better understanding of financial reporting circumstances (Bilal *et al.*, 2018). More specifically, extensive accounting and auditing knowledge allows individuals to identify and recommend conservative financial reporting policies and to reduce aggressive earnings management practices (Sultana and Van der Zahn, 2015). Individuals with industry background have the practical experience and knowledge to understand management activities and firm- and sector-specific financial reporting practices (Cohen and Hoitash, 2014). Thus, this paper investigates the influence of these expertise features of audit committee members on earnings quality in the German two-tier system.

It is important to note that existing empirical studies have focused on one-tier systems and the presence/absence of audit committee financial experts and their influence on financial reporting quality (Velte, 2017). While examinations of, for example, the effects of audit committees' members' industry backgrounds have become increasingly important in international research (Cohen and Hoitash, 2014; Lary and Taylor, 2012), the literature still lacks analyses of the effect of different levels of financial and industry expertise and different educational backgrounds. Research on executive managers suggests that individuals with one or more advanced degrees are more likely to identify opportunities, are better at problem-solving and comprehend management decisions (Francis *et al.*, 2015; Gottesman and Morey, 2006). Whether this is also true for audit committees will be examined in this study.

This study addresses these research gaps by examining the effect of audit committee members' financial and industry expertise and educational background on the earnings quality of German listed firms. It investigates the largest German firms listed in the German DAX30, MDAX, SDAX and TecDAX over an observation period of seven years (2007 to 2013) with 610 observations in total. Covering the three years before and after the legal and regulatory changes mentioned above, this observation period is ideally suited for researchers to evaluate the impact of the first considerations of audit committees by German legislators in 2010. In line with prior empirical evidence (Albersmann and Hohenfels, 2017), this study examines earnings quality by using discretionary accruals, an approach developed by Kothari *et al.* (2005). To investigate the expertise of audit committee members, whose names are commonly listed in annual reports, the study considers financial, educational, and industry indicators to analyze their impacts on earnings quality. In line with the taxonomy proposed by Lary and Taylor (2012), hand-collected information on each audit committee member's curriculum vitae and background were analyzed and scored. As well as considering corporate governance and economic factors, the model developed here also controls for several key factors used in previous studies on audit committee effectiveness (Qasim, 2018). To the best of this author's knowledge, this is the first study to focus on different and specific measurements of audit committee members' expertise and their impact on earnings quality in a two-tier system.

The study finds that audit committees that include members characterized by high levels of financial expertise and advanced educational backgrounds tend to increase firms' earnings quality. Although no relation is found between industry background and earnings management, the findings presented here provide evidence for the importance

of members' expertise in monitoring the financial reporting process, an expertise that allows them to constrain managers' earnings management and thereby improve corporate governance quality. More specifically, the combination of an advanced educational background and financial expertise seems to have a major impact on earnings quality.

While this study specifically offers new insights concerning the effectiveness of audit committees in the German two-tier system, it may have important implications for researchers and practitioners.

AGENCY-THEORETICAL FRAMEWORK AND REGULATORY BACKGROUND

Agency-Theoretical Framework

In line with prior empirical findings on the relationship between audit committee characteristics and corporate governance quality, this study builds on the double-level agency theory introduced by Tirole (1986) to investigate audit committee member expertise and its effects on earnings quality. Within this theoretical framework, there are threats of information asymmetries as well as conflicts of interest between management, the board of directors, the audit committee, and shareholders. According to these agency-theoretical assumptions, management decision-making can impair financial reporting quality through opportunistic behavior. Managers prioritize their own individual well-being, which often conflicts with shareholder interests, for example, by reporting misleading information about firm performance. In this context, managers commonly use earnings management as an instrument to achieve their individual goals. Therefore, managers may influence accounting earnings by using discretionary accruals (De Vlaminc and Sarens, 2015) or by manipulating cash flows, discretionary expenditures, or production costs (Cohen *et al.*, 2008). Jensen and Meckling (1976) suggest that establishing effective internal and external monitoring mechanisms helps to reduce information asymmetries among the involved organizational parties, minimizes opportunistic reporting practices, and ensures that management decisions are in accordance with shareholder interests. In the German two-tier system, monitoring and controlling activities are exercised by the supervisory board. With the increasing professionalization of supervisory boards, especially in the more difficult and specialized duties and responsibilities (Velte, 2017), the implementation and composition of audit committees are associated with a higher quality of monitoring of the financial reporting process (Kusnadi *et al.*, 2016). Audit committees are subcommittees of the supervisory board and represent and enforce shareholder interests. They specialize in the financial reporting framework, make recommendations to and work closely with the external auditor. Audit committees generally carry out the supervisory boards' monitoring activities to improve supervision efficiency, helping to prevent earnings management by continuous management oversight. Furthermore, effective audit committees are associated with higher probabilities of avoiding accounting mistakes before publishing financial statements (Cohen and Hoitash, 2014). Moreover, as some management activities require audit committee agreement, they have an indirect impact on accounting policies. In summary, the monitoring and advisory-related function of audit committees is of great importance in reducing information asymmetries between management, the supervisory board, and shareholders, thus improving financial reporting quality.

In line with the predictions of agency theory, expertise is crucial to an audit committee's effectiveness, which ultimately improves financial reporting quality (Ghafran and O'Sullivan, 2017). With regard to the specific working environment in the accounting framework, audit members need specialized abilities and professional knowledge to carry out their tasks and responsibilities effectively, including the choice of and cooperation with the external auditor (Aldamen *et al.*, 2012). For instance, Velte and Stiglbauer (2011) argue that financial reporting quality is strongly influenced by the professional and personal background of audit committee members. A higher educational level is assumed to result in a greater understanding of management decision-making and problem-solving (Francis *et al.*, 2015; Gottesman and Morey, 2006). Industry background is also important because each industry has its own characteristics, even in terms of financial accounting (Cohen and Hoitash, 2014). Therefore, it is expected that audit committee members with greater financial expertise, a higher educational level, and more in-depth industry background will be associated with higher financial reporting quality due to better detection of opportunistic earnings management and reduction of information asymmetry threats. Furthermore, negotiations between the external auditor and the audit committee are also expected to be positively influenced by these three types of expertise, especially when defining the scope of the audit and key audit matters.

Regulatory Background in Germany

In contrast to one-tier systems, such as in the US, audit committees are a comparatively new development in the German two-tier system and have only recently received more concentrated attention from German and European legislators.

The German regulations can be divided into "hard" (the German Commercial Code (GCC) and the German Stock Corporation Act (GSCA)) and "soft" (German Corporate Governance Code (GCGC)) law. Following European Directive 2006/43/EC, audit committees were first legally mentioned and integrated in German law (German Accounting Law Reform Act) in 2009, but there are no mandatory requirements for German listed firms to establish an audit committee as legislators have argued that these legal duties can only be exercised by the supervisory board. However, the legal due diligence requirements of the supervisory board cannot be guaranteed in the required intensity without a supporting committee due to increasing board sizes and more monitoring tasks (Velte, 2017). In practice, following the GCGC's recommendation, most German listed firms have established an audit committee (Albersmann and Hohenfels, 2017).

The 2009 German Accounting Law Reform Act listed profile requirements for audit committee members for the first time. The Act aims to generate effective audit committees, which improve the financial reporting process, optimize financial reporting quality, and support the supervisory board. In addition to the important attribute of independence, the GCC, GSCA, and GCGC also include profile requirements concerning audit committee members' financial expertise. However, these requirements are very low and not yet sufficiently detailed; audit committees are only required to have a minimum of one member with expertise in the required accounting or auditing framework. Also, there is no existing legal definition of such expertise; it is assumed that it is held by tax consultants, auditors, and certified financial officers as well as experienced accounting and controlling employees. The GCGC only recommends that

the chairman of the audit committee has specific financial expertise, i.e., specific knowledge and experience in the application of accounting principles and internal control procedures. With the implementation of EU Regulation No. 537/2014, German legislators updated and expanded the composition and responsibilities of audit committees with the Audit Reform Act in 2016. From a regulatory point of view, this explicitly shows the increasing significance of audit committees for corporate governance by extending audit committee responsibilities: committees received greater authority to select external auditors, supervise their independence, and monitor their integrity. Although the voluntary establishment and financial expertise requirements of audit committee members were not changed (the independence requirement was eliminated for German listed firms), relevant industry expertise was legally required for the first time – and by all audit committee members. However, there are no detailed legal definitions of industry expertise; only that members must have either practical experience in the firm's business or industry knowledge through advanced training or other activities such as being a consultant in related industries. The GCGC, as yet, contains no recommendations for industry expertise, nor are any requirements set out in soft or hard law regarding the educational level of audit committee members.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

With the developments in national and international regulations, research on audit committees has continuously increased over the last few years. The board system structure and long organizational tradition of audit committees in one-tier systems has meant that most prior research is concentrated on the US and Australia (Malik, 2014). Since DeZoort *et al.* (2002) defined audit committee characteristics such as composition, authority, resources, and activity as predominant determinants of their effectiveness, several studies have provided empirical evidence for the relationship between these characteristics and financial reporting quality (Ghafran and O'Sullivan, 2013). Apart from the usually examined financial reporting quality measurements such as earnings misstatements and disclosure quality, there has been a strong research focus on investigating earnings quality (Velte, 2017). Commonly used proxies for, or indicators of, earnings quality are persistence, magnitude of accruals, smoothness, timely loss recognition, benchmarks, earnings response coefficient, external indicators of earnings misstatements, and residuals from accrual models (Perotti and Wagenhofer, 2014).

Most composition-related audit committee studies investigate the relationship between the financial expertise of audit committee members and earnings quality (Kusnadi *et al.*, 2016). Several studies find evidence that audit committee effectiveness is enhanced by the presence of financial experts (Sharma and Kuang, 2014; Dhaliwal *et al.*, 2010). Others provide empirical evidence that audit committee members' financial expertise is positively associated with earnings quality, confirming the crucial role of audit committee financial expertise in constraining aggressive earnings management (Zalata *et al.*, 2018). A number of US studies show that financial expertise is associated with lower earnings management, using discretionary and abnormal accruals as a quality measure (He and Yang, 2014; Badolato *et al.*, 2014). Moreover, Sun *et al.* (2012) confirm the positive impact of audit committee expertise by providing evidence that accounting, finance, and insurance financial expertise are associated with more accurate loss reserve estimates. Outside the US, Sultana (2015) shows for Australia that audit committees with

financial experts and experienced members improve earnings quality by recognizing losses in a timelier manner (i.e., exhibit higher level of conservatism via earnings and accruals) than audit committees without such members. These results are also seen by Sharma and Kuang (2014) for New Zealand, Kusnadi *et al.* (2016) for Singapore, Lee (2014) for China, and Nelson and Devi (2013) for Malaysia. The only two German studies that examine audit committee financial expertise agree: Albersmann and Hohenfels (2017) show that earnings management is lower when at least one audit committee member has financial expertise, and Velte and Stiglbauer (2011) provide empirical evidence that earnings quality is better when more than half of the audit committee are financial experts. Nevertheless, existing findings are limited as these studies were limited to the presence/absence of a financial expert. In addition, a small number of studies have found no relation between audit committees' financial expertise and earnings quality (e.g., De Vlaminck and Sarens, 2015; Al-Dabbous *et al.*, 2015). None provide statistical evidence for a negative relationship between financial expertise and earnings quality. Consistent with prior studies, this study suggests that a firm with greater financial expertise in its audit committee enjoys a higher level of earnings quality. Better and more specific knowledge and experiences in understanding accounting policies and results in more effective monitoring, ultimately constraining management activities to manipulate earnings. In light of these expectations, the following hypothesis is proposed:

H1: Audit committees with greater financial expertise are positively associated with earnings quality.

Research studies on audit committee members' educational background are highly limited. Only one existing study investigates the association between audit committee education and earnings management and found no significant relation between the two (Qi and Tian, 2012). This lack of research is surprising since different researchers have provided evidence for the positive relationship between higher educational levels of board directors and corporate governance and firm performance (e.g., Francis *et al.*, 2015; Gottesman and Morey, 2006). Others have examined the influence of the educational level of executives on, for example, financial performance (Hsu *et al.*, 2013), which could be transferred to audit committee research. For instance, Wiersema and Bantel (1992) argue that managers with a higher educational level are more likely to have higher cognitive abilities and skills with which to handle new and complex situations. Wally and Baum (1994) also state that managers with higher educational levels are better at differentiating between possible alternatives and opportunities and make better decisions. In line with this, Hambrick and Mason (1984) show that managers with higher educational levels have better performance abilities, more rational approaches to decision-making and offer more alternatives in problem-solving. Based on these results, it can also be assumed that audit committee members with higher educational levels will be able to ensure higher quality in monitoring the financial reporting process and strengthen audit committee effectiveness. Therefore:

H2: Audit committees with higher educational levels are positively associated with earnings quality.

There is also a research gap regarding audit committee members' industry expertise and empirical findings are highly limited. Cohen and Hoitash (2014) investigate the relation between the industry expertise of audit committees and earnings quality. They provide evidence that audit committee members who are both financial and industry experts are more effective in monitoring the financial reporting process than members who have no industry expertise, leading to a lower restatement likelihood and lower discretionary accruals. They argue that industry background is associated with greater understanding of industry-specific financial reporting as well as a better understanding of management's activities. They also predict that members with greater industry background are more able to identify inconsistencies between firms' reported financial performance and underlying economic events. These results agree with Sun *et al.* (2012), who state that members with industry expertise are more able to monitor financial reporting than those without such experience. In contrast, Brazel and Schmidt (2019) observe that audit committees with industry-expert chairs are more likely to be associated with large inconsistencies than those without, arguing that audit committee chairs with more industry background can use their specific knowledge as well as their authority over the external auditor to influence audit adjustments that ultimately increase fraud risk. Nonetheless, according to Cohen and Hoitash (2014), industry expertise should enable audit committee effectiveness by better increasing understanding of reporting estimates and accounting practices as well as specific accounting policies for different industries, thus:

H3: Audit committees with higher industry background are positively associated with earnings quality.

In line with national and international regulations of the recent past which highlight audit committee members' financial expertise and industry background, and consistent with prior studies (Cohen and Hoitash, 2014; Sun *et al.*, 2012), it is predicted that audit committee members who have greater and combined expertise are associated with better audit committee effectiveness. Therefore, it is predicted that audit committee members with greater financial expertise and higher educational levels, and/or higher industry background are also positively related to earnings quality. The greater the individual skills and background, the better the ability to monitor the financial reporting process. Therefore:

H4: Audit committees with greater financial expertise and higher educational levels are positively associated with earnings quality.

H5: Audit committees with greater financial expertise and industry background are positively associated with earnings quality.

H6: Audit committees with greater financial expertise, higher educational levels, and greater industry background are positively associated with earnings quality.

RESEARCH DESIGN

Sample and Data Collection

The initial sample of this study consisted of German firms listed in the DAX30, MDAX, SDAX and TecDAX indices of the Deutsche Börse Group between 2007 and

2013. Due to the Frankfurt Stock Exchange's regulatory requirements, these firms are subject to the highest transparency and disclosure levels. The study examines the governance mechanisms of large, medium, and small firms from various industries. This period is of particular interest as it covers the years immediately before and after the German Accounting Law Reform Act changed the regulations concerning audit committee establishment and composition in Germany. Financial statements and market data were obtained from the Thomson Reuters Datastream database, whereas information on audit committee characteristics and external auditors was hand-collected from annual reports, other published reports (e.g., compensation or sustainability reports) and special published information (e.g., curriculum vitae). Consistent with prior research, firms with foreign ISINs and firms in banking, insurance, and other financial service sectors were excluded because of their specific regulatory reporting and accounting requirements, as well as their limited comparability with other firms (Albersmann and Hohenfels, 2017). Firms without an audit committee, missing data on audit committees or other control variables were also excluded from the sample. The sampling process yielded a final sample of 610 firm-year observations from 100 firms.

Measurement of Variables

Earnings Quality. Earnings management is often used as a proxy for the effectiveness of audit committees (Inaam and Khamoussi, 2016). In line with prior studies that use discretionary accruals as a measure for earnings quality and management (Kusnadi *et al.*, 2016; De Vlaminck and Sarens, 2015), this study uses the performance-adjusted modified Jones model introduced by Kothari *et al.* (2005). This approach also controls for the effect of firm performance on measured discretionary accruals. It thus strengthens test statistic specification and is more powerful (Kothari *et al.*, 2005). All variables in the regression model are deflated by lagged total assets to reduce heteroscedasticity (in line with Bedard *et al.*, 2004). Therefore, the residuals from the cross-sectional regression model are used as estimates of firms' i's discretionary accruals, as follows:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_1 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{ROA_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t}$$

where

$TA_{i,t}$	total accruals for a firm i at year t.
$A_{i,t-1}$	lagged total assets.
$\Delta REV_{i,t}$	change in net revenues in year t from year t-1.
$\Delta REC_{i,t}$	change in net receivables in year t from year t-1.
$PPE_{i,t}$	gross property, plant and equipment for firm i in year t.
$ROA_{i,t}$	return on assets for firm i in year t.

For the main model, the absolute value of discretionary accruals (DAKO) is used as the dependent variable, since earnings management can involve either income-increasing or income-decreasing accruals (Klein, 2002). The lower the absolute value of performance-adjusted discretionary accruals, the higher the earnings quality.

Audit Committee Expertise. Following prior empirical research, this study used three individual proxy measures to investigate the association between audit committee expertise and earnings quality. Following Lary and Taylor (2012), individual financial, educational, and industrial scores were generated for each analyzed firm's audit

committee members to test the hypotheses. Each audit committee member was scored for financial expertise, educational level, and industry background by reviewing their curriculum vitae and other information (e.g., annual reports), as described in Table 1.

The classification of financial expertise and industry background follows the approach of Lary and Taylor (2012). Educational level is classified based on hierarchical educational levels, i.e., apprenticeship, bachelor, master, PhD, or professor. Using the scoring taxonomy; the individual scores achieved by each member on the three measures of expertise were added together for each member, divided by the total possible score, and multiplied by 100. Thus, total relative scores for financial expertise (ACFE), educational level (ACEL) and industry background (ACIB) were generated for each audit committee. Additionally, interaction terms were defined. The first interaction term, ACFEEL, is ACFE multiplied by ACEL and is used when testing the impact of both financial and educational expertise on earnings quality. The second, ACFEIB, is ACFE multiplied by ACIB and used when testing the impact of both financial and industrial expertise on earnings quality. The third term, ACTOTEXP, is ACFE multiplied by ACEL and ACIB, and used when testing the impact of all three measures of expertise on earnings quality.

Table 1
Scoring Taxonomy

Financial Expertise Score	
<i>Score</i>	<i>Definition</i>
6	CFO, CPA, CA, or PhD/Professor of Finance/Accounting
5	Previously worked for Big Four auditor or former CFO, CPA, CA
4	Finance or accounting related accounting experience
3	Finance or accounting related undergraduate or honors degree
2	Other business qualification or law background
1	Other qualification
0	Unknown background
Educational Level Score	
<i>Score</i>	<i>Definition</i>
5	Professor
4	PhD
3	Master's degree or diploma
2	Bachelor's degree
1	Vocational training
0	Unknown background
Industry Background Score	
<i>Score</i>	<i>Definition</i>
2	Prior work experience in firm's operating industry or at least ten years' experience in current firm
1	Prior work experience in another industry
0	Unknown background

Other Audit Committee Characteristics. In line with prior research, this study employs four measures of audit committee characteristics: size, meeting frequency, independence, and compensation (Zalata *et al.*, 2018; Kusnadi *et al.*, 2016). Several empirical studies provide evidence for the relationship between audit committee size (ACSIZE) and effectiveness. For example, Mishra and Malhotra (2016) and Lin and Hwang (2010) show that larger audit committees are associated with higher earnings quality, arguing that larger audit committees have greater resources and talents and more experience and skills, and thus are more effective in monitoring the financial reporting process. Therefore, the model controls for ACSIZE. As a proxy for diligence, the number of audit committee meetings (ACMEET) is frequently used in research to examine the influence of audit committee activity on earnings management (Ghosh *et al.*, 2010). Findings support significant relationships that show both positive and negative impacts on earnings quality. For instance, higher audit committee meeting frequencies are significantly associated with a lower incidence of financial misstatements (Abbott *et al.*, 2004) and a reduced level of discretionary current accruals (Xie *et al.*, 2003). In contrast, Ghosh *et al.* (2010) argue that higher numbers of audit committee meetings are associated with audit committee inefficiency. Due to the possible impact of audit committee meeting frequency on earnings management, ACMEET was added to the model. Audit committee independence (ACIND) is considered to be crucial in monitoring the financial reporting process (De Vlaminck and Sarens, 2015). For example, Sultana (2015) shows that a higher proportion of independent members is associated with more conservative accounting principles. Therefore, the model controlled for ACIND. Engel *et al.* (2010) argue that audit committee compensation (ACCOMP) is another important determinant in monitoring the financial reporting process, providing empirical evidence that the total compensation of audit committees is positively associated with earnings quality. Few or no compensation incentives may fail to motivate diligent oversight by audit committees, which can increase the likelihood of financial reporting failures (Archambeault *et al.*, 2008; DeZoort *et al.*, 2002). Thus, the model controls for ACCOMP.

Other Corporate Governance Variables. The model involves a set of further corporate governance variables used by researchers to investigate the association between audit committees and earnings management (Kusnadi *et al.*, 2016; He and Yang, 2014). Several studies provide evidence that Big Four auditors (BIG4) perform higher audit quality. For example, Eshleman and Guo (2014) show that clients of Big Four audit firms are less likely to subsequently issue an accounting restatement than clients of other auditors. Therefore, the model contains BIG4 as a proxy for the quality of external auditors. Since most German listed firms are audited by a Big Four auditor, the model also includes an additional audit quality measure to investigate auditor independence. Prior research provides empirical evidence for the relation between audit fees and audit effort (Li and Ma, 2018). Therefore, the model controls for the audit fee ratio (AFR). Several empirical results also show that auditor rotation (AUDITORROT) is related to audit quality. For example, Cameran *et al.* (2016) find that auditor tenure is associated with audit quality and there are more audit reporting failures in the early years of the auditor-client relationship. In contrast, Chi *et al.* (2011) show that long-term auditor tenures are related to higher earnings management levels. Therefore, the model controls for AUDITORROT.

Other Control Variables. The model also includes other control variables that have been demonstrated in prior research to influence discretionary accruals (Zalata *et al.*, 2018). Several empirical studies provide evidence that larger firms (SIZE) have lower levels of discretionary accruals (Ghosh *et al.*, 2010). Dechow and Dichev (2002), in particular, argue that larger firms with predictable operations and more diversified business activities are more stable than smaller ones, which ultimately reduces accruals estimation errors. Therefore, the model controls for SIZE. Furthermore, several researchers also show a positive relationship between firm growth (GROWTH) and earnings quality (e.g., Dichev *et al.*, 2013; Dechow *et al.*, 2010). Therefore, the model controls for GROWTH. DeFond and Jiambalvo (1994) also reflect that debt influences the incentives for practicing earnings management and so leverage (LEV) is also controlled for. Moreover, several studies show that reported firm losses are associated with higher earnings management (e.g., Dhaliwal *et al.*, 2010; Baxter and Cotter, 2009). Therefore, the model considers LOSS. In line with Kothari *et al.* (2005), firm's inherent accruals and earnings process (CFT) is also controlled for. The use of this controlling variable leads to lower levels of estimation bias due to the positive correlation of the measurement error in discretionary accruals with the current level of earnings (Albersmann and Hohenfels, 2017).

Model Specification. The research design uses multivariate analyses to test the hypotheses. The model investigates the relationship between discretionary accruals (DAKO), the dependent variable for earnings quality, and the independent variables of audit committee expertise. These measures are tested in six models which differ only in the independent variable: Model 1 includes ACFE, Model 2 ACEL, Model 3 ACIB, Model 4 ACFEEL, Model 5 ACFEIB, and Model 6 ACTOTEXP. To consider the fixed time effects for each firm, the multivariate regression model tests heteroscedasticity-consistent standard errors. Thus, the following multivariate regression model is estimated:

$$\begin{aligned}
 & \text{DAKO}_{i,t} \\
 & = \alpha \\
 & + \beta_1 \text{EXPERTISE}_{i,t}((1) \text{ACFE}; (2) \text{ACEL}; (3) \text{ACIB}; (4) \text{ACFEEL}; (5) \text{ACFEIB}; (6) \text{ACTOTEXP}) \\
 & + \beta_2 \text{ACSIZE}_{i,t} + \beta_3 \text{ACMEET}_{i,t} + \beta_4 \text{ACIND}_{i,t} + \beta_5 \text{ACCOMP}_{i,t} + \beta_6 \text{BIG4}_{i,t} \\
 & + \beta_7 \text{AUDITORROT}_{i,t} + \beta_8 \text{AFR}_{i,t} + \beta_9 \text{SIZE}_{i,t} + \beta_{10} \text{GROWTH}_{i,t} + \beta_{11} \text{LEV}_{i,t} + \\
 & \beta_{12} \text{LOSS}_{i,t} + \beta_{13} \text{CFT}_{i,t} + \text{year controls}_{i,t} + \varepsilon_{i,t}
 \end{aligned}$$

where

<i>DAKO</i>	absolute value of discretionary accruals (Kothari <i>et al.</i> , 2005).
<i>ACFE</i>	audit committee's financial expertise.
<i>ACEL</i>	audit committee's educational level.
<i>ACFE</i>	audit committee's industry background.
<i>ACFEEL</i>	interaction term, where ACFE is multiplied by ACEL.
<i>ACFEIB</i>	interaction term, where ACFE is multiplied by ACIB.
<i>ACTOTEXP</i>	interaction term, where ACFE is multiplied by ACEL and ACIB.
<i>ACSIZE</i>	audit committee size, measured by total number of audit committee members.
<i>ACMEET</i>	audit committee meeting frequency, measured by total number of audit committee meetings per year.
<i>ACIND</i>	audit committee independence, measured by the proportion of independent members on the audit committee.

<i>ACCOMP</i>	audit committee compensation, measured by the natural logarithm of the total compensation paid to audit committees.
<i>BIG4</i>	Big Four auditor, coded 1 if the auditor is a Big Four accounting firm; 0 otherwise.
<i>AUDITORROT</i>	auditor rotation, coded 1 if the firm is audited by a different auditor to the one used in the previous year; 0 otherwise.
<i>AFR</i>	audit fee ratio, defined as ratio of external audit fees to total fees paid to auditor.
<i>SIZE</i>	firm size, measured by the natural logarithm of total assets.
<i>GROWTH</i>	growth rate, measured by change in total assets in year <i>t</i> from year <i>t-1</i> .
<i>LEV</i>	leverage ratio, defined as ratio of total liabilities divided by total equity.
<i>LOSS</i>	negative net income, coded 1 if the firm reports a negative net income, 0 otherwise.
<i>CFT</i>	absolute value of operating cash flow scaled by total assets.

Table 2
Descriptive Statistics

Earnings Quality						
Variable	Obs	Mean	Median	Std. Dev.	Min	Max
DAKO	610	0.004	0.002	0.078	-0.453	0.611
Audit Committee Expertise Variables						
Variable	Obs	Mean	Median	Std. Dev.	Min	Max
ACFE	610	0.622	0.625	0.115	0.361	0.944
ACEL	610	0.585	0.566	0.117	0.333	0.866
ACIB	610	0.678	0.666	0.117	0.375	0.916
ACFE	610	0.375	0.350	0.138	0.132	0.770
ACFEIB	610	0.417	0.412	0.090	0.234	0.740
ACTOTEXP	610	0.248	0.236	0.084	0.088	0.592
Other Audit Committee Variables						
Variable	Obs	Mean	Median	Std. Dev.	Min	Max
ACSIZE	610	4.316	4.000	1.107	2.000	8.000
ACMEET	610	4.431	4.000	1.757	1.000	15.000
ACIND	610	0.648	0.500	0.194	0.333	1.000
ACCOMP	610	9.217	9.145	0.904	6.620	11.156
Control Variables						
Corporate Governance Variables						
Variable	Obs	Mean	Median	Std. Dev.	Min	Max
BIG4	610	0.914	1.000	0.279	0.000	1.000
AUDITORROT	610	0.045	0.000	0.209	0.000	1.000
AFR	610	0.672	0.677	0.199	0.075	1.000
Other Firm Variables						
Variable	Obs	Mean	Median	Std. Dev.	Min	Max
SIZE	610	15.025	14.801	1.868	10.667	18.856
GROWTH	610	0.075	0.041	0.219	-0.310	1.570
LEV	610	35.190	38.355	20.163	0.000	96.080
LOSS	610	0.111	0.000	0.314	0.000	1.000
CFT	610	0.084	0.078	0.063	-0.270	0.397

Table 2 presents the summary statistics of all variables used. The sample consists of 610 observations (obs).

RESULTS

Descriptive Statistics

Table 2 summarizes the descriptive statistics of the initial sample. To eliminate potential effects of outliers, the continuous variables are winsorized at the 1st and 99th percentile. As reported, the mean (median) of discretionary accruals is 0.004 (0.002), which shows that the total amount of earnings management is 0.400 (0.200) percent of lagged total assets. Moreover, descriptive results for standard deviations (0.078) or minimum (-0.453) and maximum values (0.611) indicate a wide range in the level of earnings management. Regarding the variables of interest, the audit committees analyzed contain a mean (median) of 62.2 (62.5) percent financial expertise, 58.5 (56.6) percent educational level, and 67.8 (66.6) percent industry background. By reviewing the minimum and maximum values, it is obvious there are big differences in each expertise level in the sample. Financial expertise ranges from 36.1 to 94.4 percent, educational level from 33.3 to 86.6 percent, and industry background from 37.5 to 91.6 percent. The mean (median) value of audit committee size is 4.316 (4.000), varying from two to eight members. Audit committee meetings show a mean (median) value of 4.431 (4.000) and range from one to fifteen meetings per year. The mean (median) proportion of independent members sitting on the audit committee is 64.8 (50.0) percent. Besides a wide range from 6.620 to 11.156, the results indicate that all firms pay compensation incentives for audit committee membership. Table 2 illustrates that a mean (median) of 91.4 (100) percent of the observed firms were audited by a Big Four auditor. Moreover, the descriptive results show that the mean (median) of the proportion of audit fees to total fees paid to external auditors is 0.672 (0.677) and ranges from 7.5 to 100 percent. Additionally, there is a low rate of auditor rotation (4.5 percent on average) within this sample. The other firm control variables appear to have distributions similar to those found in previous studies (Albersmann and Hohenfels, 2017; Ghosh *et al.*, 2010).

The data structure does not suffer from crucial multicollinearity issues because the other variables do not show any high (>0.80) positive or negative correlations (Gujarati, 2003). Finally, a multicollinearity diagnostic was conducted by investigating the variance inflation factor (VIF). The results show a mean VIF for the independent variables and control variables of 1.88 with a maximum and minimum of 4.26 and 1.03, indicating no multicollinearity issues (Mendenhall and Sincich, 2011).

Multivariate Regression Analysis

Table 3 and 4 summarize the results of the multivariate regression models for the financial expertise, educational level, and industry background of audit committees and their impact on earnings quality. Regarding the adjusted R²s, the first model (financial expertise) explains 24.4 percent, the second (educational level) 24.2 percent, and the third model (industry background) explains 23.6 percent of the variability in the dependent variable. Overall, the first, second, fourth, and sixth models provide coefficients for four of the six independent variables (ACFE, ACEL, ACFEED and ACTOTEXP) which are negative and significant. Hypothesis 1 of this study is confirmed by the observed significant positive association between financial expertise and earnings quality in the first model. As expected, the coefficient of ACFE (-0.220) is significantly negative at the five percent level, indicating that audit committees with higher financial

expertise levels are related to lower discretionary accruals. The results, therefore, suggest that greater expertise in the financial and accounting framework is crucial for better quality monitoring of the financial reporting process by audit committee members; they are more effective and more capable of constraining management activities concerning earnings manipulation. This is similar to the findings of, for example, Sultana (2015) and He and Yang (2014). In addition, the second model presents the results of this investigation of the relationship between educational level and earnings quality. The coefficient of ACEL is negative (-0.197) and significant at the one percent level. Thus, the higher educational level of audit committee members is negatively associated with discretionary accruals, indicating better earnings quality. This finding suggests that audit committee members with higher educational levels perform better, have more rational approaches to decision-making, and more problem-solving ideas to avoid earnings management or accounting failures. Therefore, the second hypothesis is also confirmed. The third model does not show any significant relationship between industry background and earnings quality. Therefore, the level of industrial knowledge about the firm's operating industry has no impact on discretionary accruals. Thus, Hypothesis 3 is rejected. This result may be due to the use of Lary and Taylor's (2012) low-scaled scoring taxonomy.

Testing the impact of the interaction between financial expertise and educational level on earnings quality revealed a significantly negative coefficient of ACFEEL (-0.229), indicating that audit committee members who have both types of expertise may be able to combine their diversified knowledge and experiences to strengthen their firm's quality of reported earnings. This finding shows that audit committees should not only include financial experts but also consider the educational level of potential members. Therefore, Hypothesis 4 is confirmed. In contrast to Cohen and Hoitash (2014) and Sun *et al.* (2012), this study found no evidence of impact of the interaction between audit committee members with both financial expertise and industry background on earnings quality, thus Hypothesis 5 is rejected. Finally, there was a positive relationship between ACTOTEXP and earnings quality. The coefficient is negative (-0.157) and significant at the one percent level, suggesting that audit committee members with a higher combined financial expertise, educational level, and industry background are related to lower discretionary accruals. Thus, it can be assumed that greater knowledge, background, and experience are positively associated with audit committee effectiveness. Although the results of the third model suggest this finding might also be explained by the strong effect of financial expertise and educational level, Hypothesis 6 is also confirmed.

Of the other audit committee variables, only one has a coefficient that is negative and significant; there is a positive relationship between audit committee compensation (ACCOMP) and earnings quality in five of the six models (see Table 3 and 4). The results suggest that higher audit committee compensation is associated with better audit committee effectiveness, and consequently with lower discretionary accruals. Similar to Engel *et al.* (2010) and Archambeault *et al.* (2008), these findings indicate that audit committee members are more willing to engage in diligent financial reporting and monitoring when they receive adequate compensation or higher salaries. Regarding audit quality measures, the results of all six models show a positive and significant relationship between rotations of external auditors (AUDITORROT) and earnings quality. These findings suggest that new external auditors will bring a greater focus on

firms' accounting processes, which ultimately will constrain earnings management and improve financial reporting quality. Thus, it is assumed that new auditors are less likely to compromise on their clients' accounting and reporting choices due to their less familiar relationship with management.

Table 3
Regression Analysis (1)

Model	1 Financial Expertise		2 Educational Level		3 Industry Background	
	DAKO Coef.	t-value	DAKO Coef.	t-value	DAKO Coef.	t-value
DV						
ACFE	-0.220**	(-2.43)				
ACEL			-0.197**	(-2.26)		
ACIB					0.106	(1.32)
ACFEEL						
ACFEIB						
ACTOTEXP						
ACSIZE	-0.002	(-0.22)	0.001	(0.07)	0.002	(0.25)
ACMEET	-0.001	(-0.11)	-0.001	(-0.31)	-0.001	(-0.46)
ACIND	0.049	(0.68)	0.014	(0.20)	0.008	(0.10)
ACCOMP	-0.019*	(-1.91)	-0.019*	(-1.93)	-0.016	(-1.58)
BIG4	-0.020	(-0.71)	-0.017	(-0.61)	-0.032	(-1.24)
AUDITORROT	-0.028**	(-2.12)	-0.028**	(-2.17)	-0.026**	(-1.99)
AFR	-0.001	(-0.01)	-0.002	(-0.12)	-0.003	(-0.18)
SIZE	0.043**	(2.16)	0.050**	(2.47)	0.054**	(2.61)
GROWTH	0.032	(0.95)	0.031	(0.92)	0.029	(0.84)
LEV	-0.001***	(-3.04)	-0.001***	(-3.10)	-0.001***	(-3.07)
LOSS	-0.040**	(-2.40)	-0.041**	(-2.38)	-0.043**	(-2.45)
CFT	-0.634***	(-3.87)	-0.627***	(-3.81)	-0.631***	(-3.90)
_cons	-0.221	(-0.71)	-0.343	(-1.10)	-0.596*	(-1.74)
Firm fixed effects	Yes		Yes		Yes	
Time fixed effect	Yes		Yes		Yes	
Observations	610		610		610	
R-sq	0.268		0.265		0.260	
Adj. R-sq	0.244		0.242		0.236	
F-value	4.302		4.463		4.365	
t-values in parentheses * P<0.10, **p<0.05, *** p<0.01						

Table 3 presents the results of the multivariate regression analysis controlling for firm and fixed time effects. *, **, and *** denote significance at the 10%, 5% and 1% level. The sample consists of 610 observations

In contrast to Ghosh *et al.* (2010), the multivariate analyses illustrate a positive and significant relation between SIZE and earnings management. The results indicate that larger firms are associated with higher levels of discretionary accruals and, consequently, lower earnings quality. Additionally, there is no evidence for any impact of GROWTH on earnings quality, possibly due to the homogeneity of the observation sample. In line with Ahmed *et al.* (2002), the results show that higher leverage ratios are positively

related to earnings quality. Thus, it is assumed that managers of highly leveraged firms will be more likely to avoid earnings management due to their need to provide more detailed information about their business to lower financing costs. Unlike Dhaliwal *et al.* (2010), this study finds a positive association between reporting firm losses and earnings quality, indicating that reporting a negative net income is related to lower discretionary accruals. Thus, it is assumed that firms with large losses may be unable to manage earnings upwards sufficiently to report small profits. Finally, Table 3 and 4 provide evidence for the positive relationship between CFT and earnings quality. This indicates that firms with higher proportions of operating cash flows to total assets are related to lower earnings management.

Table 4
Regression Analysis (2)

Model	4 Interaction Financial Expertise, and Educational Level		5 Interaction Financial Expertise, and Industry Background		6 Interaction Financial Expertise, Educational Level, and Industry Background	
	DAKO Coef.	t-value	DAKO Coef.	t-value	DAKO Coef.	t-value
ACFE						
ACEL						
ACIB						
ACFEEL	-0.229**	(-2.37)				
ACFEIB			-0.022	(-0.36)		
ACTOTEXP					-0.157*	(-1.77)
ACSIZE	-0.001	(-0.22)	0.001	(0.19)	0.001	(0.01)
ACMEET	-0.001	(-0.15)	-0.001	(-0.36)	-0.001	(-0.22)
ACIND	0.047	(0.61)	-0.020	(-0.32)	-0.004	(-0.06)
ACCOMP	-0.020*	(-1.98)	-0.017*	(-1.73)	-0.019*	(-1.90)
BIG4	-0.014	(-0.48)	-0.029	(-1.11)	-0.022	(-0.81)
AUDITORROT	-0.028**	(-2.18)	-0.029**	(-2.17)	-0.029**	(-2.24)
AFR	-0.001	(-0.01)	-0.003	(-0.21)	-0.002	(-0.13)
SIZE	0.045**	(2.23)	0.051**	(2.50)	0.048**	(2.35)
GROWTH	0.033	(0.99)	0.027	(0.80)	0.029	(0.87)
LEV	-0.001***	(-3.10)	-0.001***	(-2.86)	-0.001***	(-2.86)
LOSS	-0.039**	(-2.39)	-0.042**	(-2.43)	-0.041**	(-2.42)
CFT	-0.632***	(-3.85)	-0.631***	(-3.87)	-0.628***	(-3.81)
_cons	-0.301	(-0.96)	-0.450	(-1.40)	-0.368	(-1.18)
Firm fixed effects		Yes		Yes		Yes
Time fixed effect		Yes		Yes		Yes
Observations		610		610		610
R-sq		0.272		0.256		0.260
Adj. R-sq		0.248		0.232		0.236
F-value		4.171		4.483		4.728

t-values in parentheses * P<0.10, **p<0.05, *** p<0.01

Table 4 presents the results of the multivariate regression analysis controlling for firm and fixed time effects. *, **, and *** denote significance at the 10%, 5% and 1% level. The sample consists of 610 observations.

Sensitivity Analysis

To examine the robustness of the main regression results, the following sensitivity analyses were conducted.

Alternative Accrual-Based Earnings Management Measures. In line with prior literature (Cohen and Hoitash 2014; Chen *et al.*, 2008), other accrual-based earnings measures were tested to examine the influence of audit committee expertise on earnings quality. The six models were re-estimated by using the absolute value of discretionary accruals (according to the modified Jones model by Dechow *et al.*, 1995) as the dependent variable. The results of this re-estimation are the same as those found in the main model; they provide unchanged evidence for the positive and significant influence of the audit committee's financial expertise and educational level on earnings quality. The results also show that the influence of the interaction between financial expertise and educational level on earnings quality, as well as the influence of all three types of expertise on earnings quality, is also confirmed.

Based on the similar discretionary accruals models of Kothari *et al.* (2005) and Dechow *et al.* (1995), an additional accrual-based earnings management approach was used to investigate the relationship between audit committee expertise and earnings quality to verify the robustness and sensitivity of the main results. The cross-sectional version of Dechow and Dichev (2002) as modified by Francis *et al.* (2005) was used to measure earnings management. The six models for audit committee members' financial expertise, educational level, and industry background were re-estimated by using the residuals from the regression. These residuals measure the level of current accruals, which cannot be stated in past, present, or future cash flows. The results show unchanged evidence for the positive and significant influence of the audit committee's financial expertise and educational level on earnings quality, but unlike the main model, there is also a negative and significant relationship between industry background and earnings quality (in line with the findings of Brazel and Schmidt, 2019). Nevertheless, the results of the main model are almost completely confirmed by this testing of alternative accrual-based earnings management measures.

Additional Tests on Firm Size. The main analysis does not control for differences in firm sizes. Due to the importance of firm-size bias when considering corporate governance issues, two subsamples were generated by splitting the main sample into large and small firms, using the median market capitalization as the cut-off. The six expertise models were then re-estimated with each subsample. With regard to the variables of interest (ACFE, ACEL, ACIB, ACFEEL, ACFEIB and ACTOTEX), the results for audit committee expertise differ between the subsamples but confirm the results of the main analysis in general. For large firms, the only positive significant relationship is between financial expertise and earnings quality, whereas the results for small firms show that financial expertise and educational level are related to lower discretionary accruals. Moreover, the impact of the interaction between financial expertise and educational level on earnings quality, as well as the influence of all three types of expertise show significant and positive relationships to earnings quality. Therefore, it can be assumed that audit committee expertise is of special interest for smaller firms aiming to improve their audit committee effectiveness and consequently their earnings quality.

Additional Tests on Firm Performance. Finally, this study also tested for positive and negative firm performances by using total returns. The main sample was split into two subsamples, firms with positive total returns and firms with negative total returns and re-estimated the six models with each subsample. The results show that financial expertise and educational level as well as the interaction between them and the interaction between all three types of expertise have negative and significant impacts on discretionary accruals when a firm's total return is positive. Thus, the results of the main analysis are supported by firms with a positive firm performance and it can be assumed that the importance of financial expertise and educational level is of special interest to firms with positive performance levels aiming to improve their earnings quality.

Limitations and Recommendations for Research

The findings of this study are subject to several limitations that offer opportunities for further research. Although controlled for, potential problems of endogeneity for the investigated variables of interest cannot be completely excluded. Further research could minimize this self-selection bias by investigating in similar settings, for example with mandatory regulations for the establishment and the composition of audit committees. Moreover, the specific measures used to examine the audit committee members' financial expertise, educational level, and industry background are likely to have deficiencies in their calculation and scoring methods, and consequently in their construct validity. Furthermore, there are data collection risks due to the hand-collected measurements of individual expertise. To minimize failures in analysing each audit committee member's curriculum vitae at its best, the data was strictly double-checked. Furthermore, the study was limited to a sample of DAX30, MDAX, SDAX, and TecDAX listed German firms and also does not consider firms in the banking, insurance, and financial service sectors. Thus, further research could analyse firms from other countries to verify the results of this study. Moreover, this study is also limited in its investigation period (2007 to 2013), due to its focus on the periods immediately before and after the change in regulations concerning audit committee establishment and composition in Germany. The study is also limited due to the use of discretionary accruals as a proxy for earnings quality (McNichols and Stubben, 2018). As this earnings management proxy is subject to errors of measurement, this study contains several procedures to minimize these error effects as best as possible. Therefore, this study considers the performance-adjusted modified-Jones model of Kothari *et al.* (2005) as well as, in the robustness tests, the models of Dechow *et al.* (1995) and Francis *et al.* (2005) to minimize possible errors in the measurement of accruals quality. In the case of more detailed publicly available data, further research should also analyse other audit committee characteristics, such as multi-committee memberships, age, gender diversity, or tenure.

CONCLUSION

This study provides empirical evidence for the influence of audit committee expertise on earnings quality in the German two-tier system. Focusing on a sample of 100 German firms listed in the DAX30, MDAX, SDAX, and TecDAX indices of the Deutsche Börse Group over the period 2007-2013, panel regressions were used to investigate the impact of audit committee characteristics on earnings quality – as measured by discretionary accruals – using three measurements of expertise (financial

expertise, educational level, and industry background). Unlike prior studies (He and Yang, 2014; Cohen and Hoitash, 2014), which only investigated the presence/absence of financial experts in audit committees, this is the first study to measure specific and individual characteristics of audit committee members and examine the relationship between their expertise and earnings quality in a German setting.

The results show that financial expertise and educational level are negatively associated with discretionary accruals and therefore enhance earnings quality. Audit committees with higher financial expertise levels have more specific knowledge and experience in understanding accounting policies as well as better quality overseeing of the financial reporting process. Educational level has positive impacts on audit committee effectiveness as it enables better performance abilities, more rational approaches to decision-making and more alternatives to problem-solving. Thus, the findings provide evidence that greater financial expertise and higher educational level are related to higher levels of constraining earnings management and to higher quality in avoiding accounting failures. In addition, testing the influence of the interaction between all three types of expertise on earnings quality shows that the combination of financial expertise and educational level is positively related to earnings quality. This finding shows that firms should consider both financial expertise and educational level in the composition of their audit committees to achieve higher audit committee effectiveness.

Subsample tests also indicate that audit committee members' financial expertise and educational level is of particular interest for small and profitable firms wishing to improve earnings quality. However, the study cannot provide significant evidence for any relationship between industry background and earnings quality; this may be due to the low-scaled scoring taxonomy of Lary and Taylor (2012). In addition, the results also show that audit committee compensation is positively associated with earnings quality, indicating that audit committee members are more willing to engage in diligently monitoring the financial process when they receive adequate compensation. Higher compensation thus results in lower discretionary accruals. Surprisingly, the analysis also reveals a positive relationship between auditor rotation and earnings quality. Given the increasing discussion about auditor rotation by researchers (e.g., Cameran *et al.*, 2016; Chi *et al.*, 2011) as well as by regulators, this issue should be investigated in more detail in further research.

The potential impact of audit committees, especially their expertise, on earnings quality in a German setting has received little attention in international research since the financial crisis of 2008/2009. Possible explanations are the different board systems, i.e., insider vs. outsider system, and researchers' previous lack of acknowledgement of the influence of board and committee composition and resource factors on the earnings quality of German listed firms. Researchers have started to investigate the implications of audit committee members' expertise in the German setting with a sole focus on financial expertise (Albersmann and Hohenfels, 2017; Velte and Stiglbauer, 2011), but only examined the influence of the presence/absence of a financial expert on earnings quality rather than the specific level of each member's individual financial expertise, educational level, and industry background, and their potential impact on audit committee effectiveness in the German two-tier system.

This study contributes to the existing literature in two ways. It is the first to investigate the specific individual knowledge and background of audit committee

members in a two-tier system. Therefore, this study makes a more accurate statement about the expertise of the whole audit committee instead of just looking at the presence/absence of financial experts. It is also one of the first to examine the educational level and industry background of audit committee members, which has received more attention by regulators in the recent past (e.g., German Audit Reform Act, 2016). The results show the significance of educational levels in improving audit committees' effectiveness and, consequently, higher earnings quality, and thus offer a new opportunity for future research.

By highlighting the significance of audit committees as a valuable corporate governance mechanism to improve monitoring of the financial reporting process, especially in the context of audit committee composition, the findings of this study have implications for researchers, regulators, and practitioners. On the practice side, the results indicate the influence of several individual characteristics on audit committees' effectiveness, and thus the findings can be useful in optimally staffing audit committees; firms should not concentrate only on the establishment of audit committees but also on their effective composition. With regard to the impact of (effective) audit committees on corporate governance quality, regulators should not only discuss the mandatory establishment of audit committees for listed firms in two-tier systems, but should specify and define detailed requirements for their composition. In terms of confidence aspects concerning the quality and integrity of monitoring the financial reporting process, the results also have implications for shareholders. Finally, the findings contribute to the existing literature and illustrate initial results concerning individual audit committee members' expertise in the German two-tier system.

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Antecedents and Outcomes of Salesperson Internal Customer Mind-Set

Mark C. Johlke
Professor of Marketing
Bradley University
mjoohlke@bradley.edu

Rajesh Iyer
Professor of Marketing
Bradley University
riyer@bradley.edu

Managers are increasingly cognizant of the role of salesperson's internal relations as a means to improve both employee and firm outcomes (Plouffe *et al.*, 2016). Narver and Slater (1990: 22) established "interfunctional coordination" as one of the three components of market orientation (MO) and described it as "the coordinated utilization of company resources in creating superior value for target customers." Lings (2004), Lings and Greenley (2005), and Gounaris (2006) reshaped internal marketing (IM; Berry *et al.*, 1976; Berry, 1981) into internal market orientation (IMO), which they described as a managerial philosophy designed to implement MO among customer-contact employees through specific supervisor "behaviors associated with creating satisfied and motivated employees" (Lings, 2004: 408). Because IMO is the most widely established conceptualization of employee internal relations it provides the most appropriate basis for studying them among salespeople.

However, a review of the IMO literature suggests three potential issues with directly applying it to understanding the role of salesperson internal relations. First, reflecting IM's original development by service researchers, most IMO studies have utilized samples of retail or service-type employees and so the generalizability of these results to B-B salespeople is unknown. Secondly, the original conceptualization of IMO treats it as overt firm or manager behaviors, while recent findings indicate that internal relations should instead be conceptualized, measured, and modeled as employee attitudes (Zablah *et al.*, 2012; Johlke and Iyer, 2017). Lastly, there has been very little work on managerially controllable antecedents to employee IMO. Given the importance of

creating positive internal relations between salespeople and other organizational members, this lack of understanding as to how sales managers can foster improved internal relations remains a significant impediment to developing interfunctional coordination among salespeople and other organizational members. The purpose of this paper is to address these limitations by proposing and testing a model of managerially controllable antecedents of B-B salesperson attitudes regarding internal relations and their association with important salesperson job outcomes.

CONCEPTUALIZING AND MEASURING SALESPERSON INTERNAL RELATIONS

Saxe and Weitz (1982: 343) specifically noted “customer-oriented selling can be viewed as the practice of the marketing concept at the level of the individual salesperson and customer.” Zablah *et al.* (2012) conducted a meta-analysis comparing customer orientation (CO) as an employee attitude that is antecedent to employee performance, stress, and engagement against a model reflecting the dominant view of CO as employee behavior resulting from stress and engagement. Their results strongly supported modeling CO as an employee attitude that is both directly antecedent to job performance and indirectly related via reduced employee role stress and improved job engagement. Johlke and Iyer (2017) provided further support for modeling B-B salesperson CO as an attitude as well as for the superiority of measuring it as an attitude and not as behavior, as has been commonly done.

CO and IMO are both derived from MO and so conceptually are highly similar. As recent findings show that frontline employee CO should be considered as an attitude then logically frontline employee IMO should likewise be treated as an attitude. However, the majority of researchers have measured IMO using scales developed by either Lings and Greenley (2005) or Gounaris (2006) that explicitly treat IMO as firm or manager behaviors. Fortunately, an appropriate means of conceptualizing employee internal relations as an attitude was provided by Kennedy *et al.* (2002) who developed the concept of customer mind-set (CMS) as a way to consider and measure the degree to which the firm’s level of MO extends all the way to the attitudes of its frontline employees. Kennedy *et al.* (2002: 159) defined CMS as “the extent to which an individual employee believes that understanding and satisfying customers, whether internal or external to the organization, is central to the proper execution of his or her job.” Accordingly, CMS properly conceptualizes internal relations as an employee attitude and so provides a means to measure it consistent with its attitudinal nature.

The first dimension of CMS, internal customer mind-set (ICMS), refers to an employee’s active consideration of those individuals or departments within the same firm that is affected by that employee’s work. Its second dimension, external customer mind-set (ECMS), refers to the employee’s consideration of those individuals or entities outside of the firm who is affected by that employee’s work. As ICMS conceptually corresponds with Zablah *et al.*’s (2012) and Johlke and Iyer’s (2017) findings that employee attitudes are the basis for internal relations and that it offers the proper means to measure salespeople’s attitudes towards internal relations, in this study it will serve as the basis for examining antecedents and outcomes of salesperson attitudes regarding internal relations.

THE MODEL

Figure I shows the proposed model. This model is based upon Job Demands-Resources (JD-R) theory (Bakker and Demerouti, 2007), specifically the results from Zablah *et al.*'s 2012 meta-analysis. In JD-R theory, demands refer to physical, psychological, social, or organizational aspects of a job that require physical and/or psychological effort or skills, while resources refers to physical, psychological, social, or organizational aspects of a job that achieve work goals, reduce job demands and the associated physiological and psychological cost and/or stimulate personal growth, learning, and development. Zablah *et al.* (2012) found that "frontline employees' levels of job stress and job engagement are the proximate determinants of worker outcomes, such as performance and turnover intentions. Frontline employees' stress and engagement levels are in turn a function of the resources available to employees and of the demands employees face on the job" (2012: 25). In this study, ICMS represents the relevant B-B salesperson resource, ambiguity regarding external customers represents salesperson stress, while job satisfaction and organizational commitment represent salesperson job engagement. Job autonomy and feedback also represent salesperson resources and are modeled as managerially controllable antecedents to salesperson ICMS. Job performance is included as the definitive salesperson job outcome.

Antecedents to ICMS

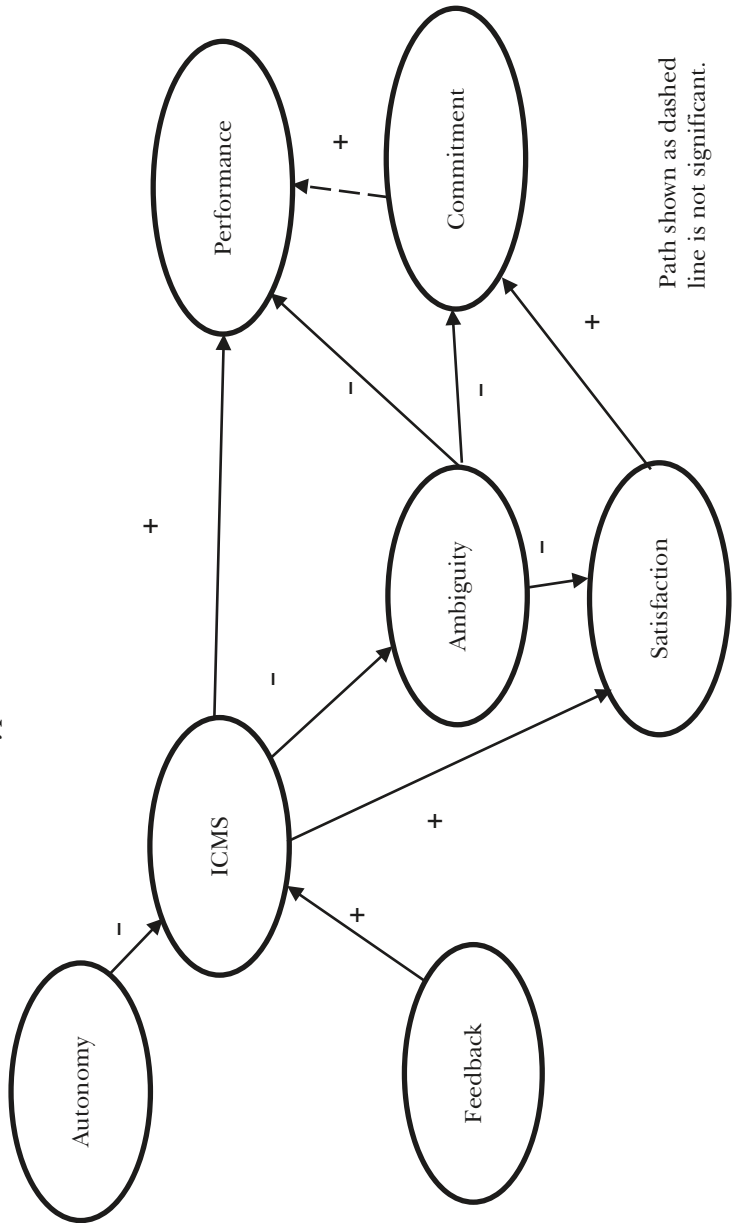
Verbeke *et al.* (2011) report that salespeople are particularly susceptible to organizational variables such as internal relationships. One of the most widely accepted and utilized conceptualization of internal organizational variables is provided in Hackman and Oldham's (1975) job characteristics model (JCM) that describes the employee's work environment using five components: autonomy (the ability to influence work schedule and procedures), feedback (that employees receive direct and clear information about their performance), skill variety (degree to which employees utilize different skill sets), task significance (degree to which the employee's work is impactful), and task identity (degree to which the job allows completing a task). Through day-to-day managing and coaching, sales managers are able to directly influence the level of autonomy and feedback their salespeople experience and so these characteristics are included in the model.

No studies were found that specifically looked at the relationship between job autonomy and ICMS or any associated constructs such as MO, IM, IMO, or CO. However, Barnabas and Mekoth (2010) found a positive association between the amount of goal-setting autonomy among retail bankers and the employing firm's level of market orientation, while Parker (2007) reports a positive association between autonomy and role orientation (i.e., the way in which employees define their role, which necessarily includes their attitudes regarding the role and importance of internal relations). Kirca *et al.* (2005) found that interdepartmental connectedness, i.e., the amount of formal and informal direct contacts among employees across departments, is the strongest antecedent to firm-level market orientation. At the level of individual employees, this connectedness is likely to be dependent upon the amount of job autonomy that the employees have in accomplishing their tasks. Logically, front-line employees operating within a culture in which they're given a greater degree of autonomy to interact with co-workers are more likely to develop a deeper pool of experiences regarding other

employees, including a stronger appreciation of how their work affects others within the firm. Accordingly, the first hypothesis is:

H1: Job autonomy is positively associated with ICMS.

Figure I
The Hypothesized Model and Results



Job feedback is one of the main tools used by managers to implement and reward desired behaviors and attitudes and the researchers who developed the MO, IM, and IMO constructs all expressly described the crucial role of communication among organizational members in building desirable firm and employee outcomes. No studies were found that specifically looked at the relationship between job feedback and ICMS, but Panigyrakis and Theodoridis (2008) report that job feedback is associated with higher levels of IM among supermarket managers. Roman *et al.* (2002), Pelham and Kravitz (2008), and Nuryakin and Sugiyarti (2018) found that job training, which necessarily entails considerable feedback, is positively related to increased CO. Logically, as salespeople engage with internal partners they accumulate more feedback regarding the best ways to work with individuals and other departments and this feedback should increase the strength and depth of the salesperson's understanding of how his/her work affects others within the firm. Accordingly, the following relationship will be tested:

H2: Job feedback is positively associated with ICMS.

ICMS and Salesperson Job Performance

In this era of quickly commoditized products and highly knowledgeable buyers, one of the salesperson's most important tasks may be developing and utilizing internal relations in order to provide customers with superior solutions and service. ICMS is likely to be a key attitude that helps them to form the intraorganizational understanding and political skills to develop the specific type of intraorganizational coordination that is required to satisfy their external customers. While the relationship between salesperson ICMS and performance has yet to be examined, Laask *et al.* (2004) found a positive association between ICMS and job performance among marketing managers. In addition, several researchers report a positive relationship between IMO and firm or employee performance (Tortosa *et al.*, 2009; Lings and Greenley, 2009; Sanchez-Hernandez and Miranda, 2011), while Kalra *et al.* (2017: 332) report that salesperson political skill, defined as "the ability to effectively understand others at work" is directly related to improved creative performance. These results suggest the following formal relationship:

H3: ICMS is positively associated with job performance.

ICMS and Salesperson Stress

In this study, the salesperson's level of uncertainty regarding external customers serves as the relevant form of salesperson stress because it's concerned with the primary focus of the salesperson's efforts. While no studies on the relationship between ICMS and employee stress were found, Pettijohn *et al.* (2014) and Dursum and Kilic (2011) report that salesperson CO is negatively associated with role ambiguity. In addition, Zablah *et al.* (2012) and Johlke and Iyer (2017) found that the other component of CMS, external customer mind-set (ECMS), is negatively associated with salesperson customer ambiguity. Logically, salesperson ICMS is likely to be negatively associated with customer ambiguity because of the conceptual similarity between ECMS and ICMS and because of the salesperson's need for cognitive consistency, i.e., the tendency for

individual's attitudes to be consistent across situations (Festinger, 1957). This research will be the first to test the association between ICMS and salesperson ambiguity by hypothesizing the following:

H4: ICMS is negatively associated with external customer ambiguity.

ICMS and Salesperson Engagement

In this study, the salesperson's level of job satisfaction serves as the primary form of salesperson engagement. Based on the theory of social exchange (Homans, 1958), service providers are felt to benefit both extrinsically and intrinsically from satisfying their customers, and research across a variety of settings supports the positive relationship between pro-customer attitudes and employee job satisfaction (e.g., Brown and Lam, 2008; Bradford *et al.*, 2009). Although no studies were found that examined the relationship between ICMS and job satisfaction among salespeople, Lassk *et al.* (2004) found that ICMS among marketing managers is associated with increased levels of job satisfaction. Therefore, this research will test the following:

H5: ICMS is positively associated with job satisfaction.

Salesperson Stress, Engagement, and Job Outcomes

Meta-analytic studies of the relation between role ambiguity and job satisfaction among frontline employees (Brown and Peterson, 1993; Zablah *et al.*, 2012) provide identical estimates of the strength of their negative relationship ($\beta = -0.33$). Likewise, ambiguity regarding customers is consistently negatively associated with job satisfaction (Singh and Rhoades, 1991; Rhoades *et al.*, 1994; Johlke *et al.*, 2000; Johlke and Duhan, 2000; Johlke and Iyer, 2017) and so the hypothesized model proposes a similar relationship:

H6: Customer ambiguity is negatively associated with job satisfaction.

Meta-analyses by Brown and Peterson (1993), Verbeke *et al.* (2011), and Zablah *et al.* (2012) all report that role ambiguity is negatively associated with job performance ($\beta = -0.28, -0.25, \text{ and } -0.28$, respectively). Similarly, researchers have consistently reported that customer ambiguity is negatively related to employee job performance (Rhoades *et al.*, 1994; Johlke and Duhan, 2000; Johlke and Iyer, 2013; Johlke and Iyer, 2017). Accordingly, the following relationship is proposed:

H7: Customer ambiguity is negatively associated with job performance.

Morgan and Hunt (1994: 23) described commitment as when "an exchange partner believes that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it." Zablah *et al.* (2012) report that role ambiguity is directly and negatively associated with organizational commitment ($\beta = -0.10$). Rhoades *et al.* (1994) and Johlke and Iyer (2017) report a strongly negative association between customer ambiguity and organizational commitment and so the following will be tested in this study:

H8: Customer ambiguity is negatively associated with organizational commitment.

Brown and Peterson's (1993) meta-analysis of salesperson job satisfaction strongly indicates that it is significantly associated with organizational commitment ($\beta=0.47$). More recently, Johlke and Iyer (2017) found that B-B salesperson job satisfaction is positively related to their level of organizational commitment. Accordingly, the proposed model contains the following path:

H9: Job satisfaction is positively associated with organizational commitment.

Verbeke *et al.* (2011: 411) note that work engagement, defined as "a persistent positive affective-motivational state of fulfillment," is one of the five categories of valid predictors of salesperson job performance. One of the most commonly studied forms of work engagement is organizational commitment, which in meta-analyses conducted by Jaramillo *et al.* (2005) and Zablah *et al.* (2012), is significantly associated with improved job performance. Therefore, this research proposes the following:

H10: Organizational commitment is positively associated with job performance.

METHOD

Data for this study was gathered from a sample of B-B salespeople working in India. While there are differences between Indian and Western cultures, Sharma (2016: 99) observes that "aptitude attributes, such as mental abilities and personality characteristics (e.g., empathy and sociability)" are highly similar between salespeople in emerging and developed economics and so this sampling frame should not impact the generalizability of the results. The authors of this study hired a professional market research firm based in Chennai India, which contacted a randomly drawn list of companies from across the country that engage in business-to-business selling and requested their participation. The firms that agreed to participate in the study operate both domestically and internationally in the following industries: industrial plant and machinery, industrial supplies, building and construction, hand and machine tools, automobile parts and spares, furniture and supplies, mechanical parts and spares, computer and IT solutions, telecom equipment goods and services, electronics and electrical, chemicals, and dyes and solvents. Next, the research firm's personnel delivered copies of the questionnaire developed by the researchers to each of the firms that agreed to participate in the study. These firms distributed the questionnaire forms to their salespeople, promised them anonymity, and encouraged them to candidly participate in the study. All respondents could read and speak English so the questionnaire was not translated into their native language. A total of 425 questionnaires were distributed to 270 firms and 396 usable responses were collected by the research firm's personnel (response rate of 93%), who forwarded the results to the authors. The typical respondent was a male with 6-10 years of experience with their current firm that employs 100-500 in total. All items used in the questionnaire are shown in Table 1.

The authors used confirmatory factor analysis to test the measurement quality of the indicators (Anderson and Gerbing, 1988). Results showed that all factor loadings are significant at the 0.01 level and that all individual reliabilities are above the required value of 0.4 (Bagozzi and Baumgartner, 1994). Convergent validity was established through each of the items exhibiting acceptable loadings (path estimate >0.50) and significant t-values ($t > 2.0$). For discriminant validity, the amount of variance extracted

for each construct was compared with the squared phi estimates (Fornell and Larcker, 1981) and the estimates for all constructs was greater than the squared phi estimate, thus indicating sufficient discrimination between the variables. The reliability of the scales was assessed by calculating their composite reliability scores. Using LISREL 8.5, the goodness-of-fit measures for the full measurement model indicated a strong overall fit to the data: $\chi^2_{(384)} = 1322.22$, $p < 0.01$, standardized RMR = 0.029, RMSEA = 0.07, NNFI = 0.98, IFI = 0.99 and CFI = 0.99. Tests for common method variance (CMV) included both the Harman's One Factor test (Harman, 1967) and the Confirmatory Factor Analysis model (Williams *et al.*, 2010), neither of which found evidence that CMV biased the results. Multicollinearity was examined using the Variance Inflation Factor (VIF) and since the values for each factor was below the upper threshold of ten as recommended by Burns and Bush (2000), multicollinearity is not a concern.

RESULTS

The hypothesized model was tested using LISREL 8.5 and found to fit the data well: $\chi^2_{(394)} = 1587.91$, $p < 0.01$; $\chi^2/df = 4.03$; RMSEA = 0.08; standardized RMR = 0.04, IFI = 0.98; CFI = 0.98; NNFI = 0.98. This model explains 83% of the variance in internal customer mind set, 87% in customer ambiguity, 85% of job satisfaction, 94% of organizational commitment, and 90% of job performance. As shown in Table 2, nine of the ten hypothesized paths are significant, the one exception being the path between organizational commitment and performance. These results support Sharma's (2016) contention that results from studies of aptitude attributes in advanced economies are applicable to developing economies. In sum, B-B salesperson's job characteristics serve as important managerially controllable antecedents to salesperson ICMS, B-B salesperson internal relations is best treated as an attitude, and salesperson ICMS is both directly and indirectly associated with important salesperson job outcomes.

Table 1
Measurement Items

Scale/Items	Mean	S.D	Standardized Loading (t-values)	Source/adapted from
Job Satisfaction (CR= 0.91; VE=0.73) (Seven-point Likert items ranging from “Strongly Disagree” to “Strongly Agree”) I am generally satisfied ...with the support provided by my firm/organization. ...with my supervisor at my firm/organization. ...with my fellow workers at my firm/organization. ...with the customers at my firm/organization.	5.18	1.07	0.88 (22.08) 0.87 (21.66) 0.86 (21.02) 0.80 (18.87)	Churchill <i>et al.</i> (1974)
Organizational Commitment (CR= 0.92; VE=0.75) (Seven-point Likert items ranging from “Strongly Disagree” to “Strongly Agree”) The relationship that I have with my firm is something that I am very committed to. The relationship that my firm has with me is something that they are very committed to. My firm focuses on long-term goals in this relationship. I expect to be with my current firm for a long time.	5.13	1.08	0.89 (22.54) 0.84 (20.42) 0.87 (21.57) 0.85 (20.62)	Daugherty <i>et al.</i> (2002)
Job Autonomy (CR= 0.94; VE=0.72) (Seven-point Likert items ranging from “Very Little” to “Very Much”) How much are you left on your own to do your own work? To what extent are you able to act independently of your immediate supervisor in performing your job functions? To what extent are you able to do your job independently of others? The amount of freedom that I have to do pretty much what I want to do on my job is... The amount of opportunity that I have for independent thought and action at this job is... The amount of control that I have over the pace of my work is...	4.93	1.03	0.77 (17.86) 0.86 (21.32) 0.85 (20.73) 0.89 (22.22) 0.87 (21.54) 0.83 (19.95)	Sims <i>et al.</i> (1976)

CR= Construct Reliability; VE = Variance Extracted

Table 1 (continued)
Measurement Items

Scale/Items	Mean	SD	Standardized Loading (t-values)	Source/adapted from
Job Feedback (CR = 0.94; VE = 0.73) (Seven-point Likert items ranging from "Very Little" to "Very Much") To what extent do you find out how well you are doing on the job as you are working? To what extent do you receive information from your immediate supervisor about your job performance? The amount of feedback that I receive from my immediate supervisor about how well I am doing is... The amount of opportunity that I have to find out how well I am doing on my job is... The amount of feedback that I get regarding whether I am performing my job well or poorly is...	5.03	1.06	0.84 (20.32) 0.85 (20.83) 0.84 (20.37) 0.87 (21.76) 0.87 (21.54)	Sims <i>et al.</i> (1976)
Job Performance (CR = 0.93; VE = 0.81) (Seven-point Likert items ranging from "Strongly Disagree" to "Strongly Agree") I am better than average in identifying and working with important customers. I am better than average in providing service to customers. I often exceed the targets and objectives that are assigned to me. Customer Ambiguity (CR = 0.93; VE = 0.77) I am certain which specific product benefits I am expected to highlight for customers. I am certain how I am expected to interact with my customers. I am certain which specific company strengths should I present to my customers. In my job, I am certain how much service I should provide to my customers. Internal Customer Mind-Set (CR = 0.91; VE = 0.71) (Seven-point Likert items ranging from "Strongly Disagree" to "Strongly Agree") I believe that... ...all employees need to understand how their job fits into the overall operation. ...it is important to receive feedback from employees who receive my work. ...it is important to understand what is expected of me by employees who receive my work. ...I ensure that employees who depend on my work output communicate with me.	5.18	1.11	0.89 (22.22) 0.89 (22.34) 0.91 (23.12) 0.91 (23.03) 0.87 (21.45) 0.85 (20.92) 0.87 (21.29)	Behrman and Perreault (1982) Singh and Rhoades (1991) Kennedy <i>et al.</i> (2002)
CR = Construct Reliability; VE = Variance Extracted	5.19	1.05	0.81 (19.19) 0.86 (21.05) 0.86 (20.92) 0.84 (20.05)	

Table 2
Hypothesized Model Standardized Paths

Hypothesis	Path	Standardized Path Estimate	Result
H1	Job Autonomy → ICMS	0.42	Supported
H2	Job Feedback → ICMS	0.50	Supported
H3	ICMS → Job Performance	0.69	Supported
H4	ICMS → Customer Ambiguity	-0.93	Supported
H5	ICMS → Job Satisfaction	0.66	Supported
H6	Customer Ambiguity → Job Satisfaction	-0.27	Supported
H7	Customer Ambiguity → Job Performance	-0.31	Supported
H8	Customer Ambiguity → Organizational Commitment	-0.20	Supported
H9	Job Satisfaction → Organizational Commitment	0.79	Supported
H10	Organizational Commitment → Job Performance	0.04	Not Supported

DISCUSSION AND MANAGERIAL IMPLICATIONS

Researchers and managers consider salespeople's positive internal relations to be an important tool in improving both salesperson and customer (internal and external) outcomes. The first pair of relationships in this research constitute the initial component of its original contribution by positing two managerially controllable antecedents to ICMS: job autonomy (H1) and job feedback (H2). Both relationships were strongly supported (standardized path estimates of 0.42 and 0.50, respectively) and so indicate that salesperson attitude regarding internal relations can be enhanced by specific managerial actions. Specifically, the sales managers can assist their salespeople in developing ICMS by providing them with exposure to others inside the firm through formal training, information sessions, and cross-functional teams, as well as through informal opportunities such as social activities. Regarding feedback, sales managers should facilitate salespeople receiving feedback from other organizational members regarding the quantity and quality of engagement and cooperation that they have with others through 360-degree reviews and cross-functional debriefing sessions.

The next set of relationships constitute the second component of this study's original contribution by examining the direct paths between ICMS and salesperson performance, stress, and engagement. ICMS is associated with increased salesperson job performance (H3, standardized path estimate of 0.69), likely due to the salespeople's enhanced ability to utilize the firm's internal resources and to employ others in the firm to work with them to serve their external customers. ICMS is also strongly associated with lower ambiguity regarding external customers (H4, standardized estimate of -0.93) and increased job satisfaction (H5, standardized estimate of 0.66). These findings, considered separately and in total, highlight the role of salesperson ICMS to directly impact these important job outcomes. Consequently, sales managers should consciously utilize not only appropriate job characteristics but also selection processes, training, culture, and reward structures so to promote ICMS among their salespeople.

The remaining hypotheses (H6–H10) complete the model by describing the expected relations among salesperson stress, engagement, and performance. While these individual relations have been widely established in previous research, they are included in the hypothesized model to provide a wider ground for appreciating the importance of salesperson ICMS. As expected, customer ambiguity is associated with reduced job satisfaction (H6, standardized path estimate of -0.27), performance (H7, standardized path estimate of -0.31), and organizational commitment (H8, standardized path estimate of -0.20), while job satisfaction is very strongly associated with organizational commitment (H9, standardized path estimate of 0.79).

However, the expected path between organizational commitment and performance was not significant (standardized path estimate of 0.04). This relationship, like all those in the proposed model, is based upon findings from studies almost exclusively conducted in advanced, usually Western, economic settings. However, this study was conducted using a sample of Indian salespeople and so it is likely that the lack of a significant relationship between these two particular constructs is due to the unique cultural and economic characteristics in that country. Specifically, Piercy *et al.* (2011) found no relationship between turnover and effectiveness among employees in countries like India with rigid employment regulations. Jaramillo *et al.* (2005) found that the relationship between organizational commitment and job performance is stronger for collectivist cultures, while Kwantes (2007: 36) noted that “Indian employees have typically been socialized into an organization in a very individualistic context” and that in work settings they exhibit “higher levels of individualism than comparable Western employees.” Kwantes (2007: 30) also explained the lack of association between organizational commitment and performance among Indian employees as being a direct result of rapid economic growth and subsequent high levels of turnover that allows employees to change jobs easily, which has led to a shift “toward employment relationships that emphasize strong performance for the duration of the task rather than commitment on the part of employees.”

LIMITATIONS AND FUTURE RESEARCH

While the results of this study strongly support the proposed model, its limitations must be noted. First, as this study focused on salesperson-level constructs and not on internal customer constructs such as co-worker satisfaction with salespeople or a measure of internal relationship effectiveness, evidence for their association with salesperson ICMS was not directly established. However, this study provides guidance for measuring and modeling ICMS and so those additional studies should build upon this framework to specifically investigate the relations between salesperson ICMS and internal customer constructs. Second, as the lack of any association between organizational commitment and performance is contrary to the results found in advanced economic settings, future researchers are advised to further investigate this and other generally accepted relations (e.g., between commitment and intent-to-leave) across different cultural and economic settings.

Third, this study relied upon respondents’ self-reported job performance when a more objective measure would be preferable. Self-reported sales performance is positively associated with managerial evaluations and percentage of quota met but the correlations vary widely and researchers are encouraged to use measures that directly

correspond with the manner in which salespeople are actually evaluated by their employing firm such as percentage of sales or activity quota. It would also be useful to include constructs from other known determinants of salesperson performance (e.g., cognitive aptitude, degree of adaptiveness, selling related knowledge: Verbeke *et al.*, 2011) so to better isolate the relative impact of ICMS.

Additional research should also consider a wider range of antecedents to ICMS, particularly those that are directly controllable through managerial actions (e.g., selection, training, coaching, reward structure). In this way, developing greater levels of understanding and concern among salespeople for how their work impacts others in the firm could be enhanced and aimed towards developing employee and firm-wide responses to constantly changing environmental factors and customer demands.

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Advice-Taking in Ethical Dilemmas

Danny Franklin

Assistant Professor

University of Wisconsin – La Crosse
dfranklin@uwlax.edu

Amy J. Guerber

Assistant Professor of Management

West Texas A&M University
aguerber@wtamu.edu

Organizational decisions are rarely made in social isolation. When faced with a decision, people may rely on advice from others to help interpret the context, evaluate alternatives, and make a choice. Taking advice can help decision-makers improve their judgment (Dalal and Bonaccio, 2010), maintain interpersonal relationships in the organization (Phillips, 1999), comply with organizational norms like accepting help from others, and diffuse responsibility for adverse decision outcomes (Harvey and Fischer, 1997). Previous research has explored how characteristics of the decision, decision-makers, and advisors impact decision-makers' openness to advice, but advice-taking has not been studied in the context of ethical decisions where the factors influencing openness to advice may differ from other types of decisions.

Ethical decisions involve deliberations of moral norms and standards, or potentially harmful consequences for stakeholders (Treviño, 1986). They often do not have an objectively correct solution and are inherently judgmental (as opposed to intellectual) in nature. Individuals faced with ethical decisions make moral judgments about their options based on their own ethical values or the ethical norms and standards of those around them (Treviño, 1986). In ethical decision-making, taking advice could have both advantages and disadvantages. On one hand, advice might provide valuable insights about the ethical values and norms of others, and may increase the likelihood that a decision-maker's choice will be accepted by others. On the other hand, advice might be a distraction from the decision-maker's own moral compass and may decrease the chance that the decision-maker will feel good about the choice made. Taking advice about an ethical issue might increase the decision-maker's accountability for the decision process but also reduce the decision-maker's personal responsibility for the outcome of the decision.

For the current study, a theoretical model is developed to predict openness to advice in an ethical decision context using individual and situational factors which are specifically relevant in ethical decision-making. The applicability of this model is compared to a more generic model of advice-taking which incorporates predictors previously found to influence openness to advice in non-ethical decision tasks. These models are referred to as the ethical decision advice-taking (EDAT) model and the generic advice-taking (GAT) model, respectively, throughout this paper. The results show that the ethical decision advice-taking model explains significant variance in individuals' openness to advice about an ethical decision while the generic model does not. Furthermore, the results of this study show that individuals faced with ethical decisions are most open to taking advice when they have little concern for the ethical implications of the decision.

LITERATURE REVIEW

Advice-Taking

Advice-taking behaviors have been studied in numerous literatures including judgment and decision-making, communications, persuasion, and social/information networks (Rader *et al.*, 2017). Within the organizational decision-making literature, dominant frameworks include Judge-Advisor Systems (JAS) and Hierarchical Decision-Making Teams (HDT). This literature often focuses on understanding the factors which influence decision-makers' willingness to receive and utilize advice, and the accuracy or quality of their decisions. Previous research holds that advice-taking can be affected by (1) the characteristics of the decision, (2) characteristics and perceptions of advisors, and (3) the characteristics of decision-makers themselves (Gino and Schweitzer, 2008; Tost *et al.*, 2012).

First, advice-taking is affected by certain characteristics of the decision. Research has found that people tend to be more receptive to advice when facing particularly difficult decisions or in situations that are uncertain or ambiguous in nature (Gino and Moore, 2007). Indeed, when people are unable to envision the possible outcomes of a decision, or unable to predict the probabilities of various outcomes, they may come to rely on advice to navigate the decision at hand (cf. Milliken, 1987). Recent research has found that decision-makers are more likely to take advice when decisions are of low urgency but high criticality as opposed to high urgency and low criticality (Johnson and Johnson, 2017). This suggests that decision-makers consider taking advice to be valuable when facing important decisions but also see gathering and evaluating advice as a time-consuming endeavor.

In addition to the difficulty of the task itself, the extent to which the decision task has an "objectively correct answer within a shared conceptual system" (Gino and Moore, 2007: 31) or involves "political, ethical, aesthetic or behavioral judgments for which there is no objective [answer]" (Laughlin, 1980: 128) – that is, the extent to which the task in question is *intellective* versus *judgmental* in nature – may affect advice-taking as well. A majority of early advice-taking studies focused on intellective decision tasks because such tasks allow the researcher to quantitatively measure the accuracy of a decision and the extent to which a decision-maker's final choice is influenced by advice they received (Rader *et al.*, 2017). More recently, researchers have begun exploring advice-taking in judgmental decision tasks (Van Swol, 2011; Yaniv *et al.*, 2011).

Intellective decisions involve matters of fact, and value of advice can be objectively evaluated in terms of accuracy. Judgmental decisions involve matters of taste or opinion, making the quality or value of advice subjective. One study found that decision-makers are more likely to take advice in intellective as opposed to judgmental decisions (Van Swol, 2011).

Second, advice-taking is affected by the characteristics and perceptions of advisors. Generally, decision-makers wish to take good advice while avoiding or ignoring bad advice, but because they cannot directly determine how good a particular piece of advice is, they rely on cues from the advisor to make inferences about the quality of the advice offered. Decision-makers' perceptions of advisors' expertise may be based on information about their credentials, background, and track-record. Many experimental studies manipulate the perceived expertise of advisors by providing decision-makers with information indicative of relevant expertise or by demonstrating the advisors track-record in related decision tasks. Perceptions of an advisor's expertise can also be influenced by communication and interactions between the advisor and decision-maker. For example, research has found that advisors who use a higher construal level when discussing the problem at hand are perceived as having greater expertise than those who discuss the problem in low construal terms (Reyt *et al.*, 2016). Research has also found that decision-makers are more likely to take advice from others they view as experts in the field (Borgatti and Cross, 2003). They may accept advice from people they view as more experienced and better informed, and discount advice from people they view as less knowledgeable (Soll and Larrick, 2009; Tost *et al.*, 2012). People may also be inclined to accept advice from others they view as more confident than themselves, and from people they trust to make the right decision (Snizek and Van Swol, 2001; Van Swol, 2011).

One's *similarity* with advisors on dimensions like status, values, and personality can influence advice-taking as well (Gino *et al.*, 2009). When decision-makers lack information needed to make an optimal decision, taking advice from cognitively diverse advisors who offer different perspectives is more likely to improve decision-making than taking advice from cognitively similar advisors. Nonetheless, research generally finds that decision-makers are more likely to trust advisors who they perceive as similar to themselves, and often discount or ignore advice that is distant from their own judgments (Rader *et al.*, 2017). Homophily is thought to have tremendous implications for organizational interactions with wide-ranging implications. In the advice-taking literature, researchers have found that decision-makers are more likely to interact with and accept advice from similar advisors (Feld, 1984; McPherson *et al.*, 2001), but this relationship also varies across different types of decisions. Homophily plays a larger role in predicting decision-makers' willingness to accept advice in judgmental decisions than in intellective decisions. In judgmental decisions, a decision-maker's perception that an advisor shares similar values increases the decision-maker's trust in the advisor, which increases the decision-maker's willingness to accept advice. In intellective decisions, perceived similarities in values do not relate to increased trust in an advisor. Instead, perceptions of the advisor's confidence are positively related to trust and willingness to take advice in intellective decisions (Van Swol, 2011).

Third, certain characteristics of decision-makers also affect their advice-taking. Personal characteristics like ambiguity tolerance (i.e., one's dispositional orientation towards "complex, unfamiliar and insoluble" stimuli; McLain, 2009), narcissism (i.e., a

sense of self-admiration and belief in one's superiority to others; Kausel *et al.*, 2015), and power (i.e., one's "capacity to influence others, stemming from... control over resources, rewards, or punishments;" See *et al.*, 2011) may influence decision-makers' openness to advice. When decision-makers are extremely averse to ambiguity, for instance, they may adopt an avoidance orientation (or a flight response) when faced with ambiguous decisions, skewing their advice-taking in these situations. Narcissistic decision-makers discount the competencies of others and take less advice than non-narcissists. Additionally, non-narcissists increase advice-taking when they expect to be held accountable for their decision process, but such accountability does not alter narcissists' advice-taking (Kausel *et al.*, 2015). High-power decision-makers have been found to be more confident in their own judgments and less willing to take advice than those with less power (See *et al.*, 2011), although those who view their power as a responsibility are more likely to accept advice than those who view their power as an opportunity (De Wit *et al.*, 2017).

Decision-makers' internal states like confidence, anxiety, anger, and gratitude may also have predictable effects on advice-taking (Gino and Schweitzer, 2008). Anxiety has been found to decrease decision-makers' self-confidence leading to increased advice-seeking and taking. Anxiety also reduces decision-makers' ability to discern whether or not advice is good and whether or not an advisor has a conflict of interest (Gino *et al.*, 2012). In a study of undergraduate students at Carnegie Mellon University, Gino and Schweitzer (2008) found that incidental anger (unrelated to the judgment task itself) caused people to be less receptive to advice from others, presumably because the negative emotion led to reduced trust in others while gratitude caused people to be more receptive to advice from others, eventually resulting in more accurate judgments in the experimental task (Gino and Schweitzer, 2008). More recent research suggests that it is the interaction between the valence (positive or negative) and the agency (self-focused or other-focused) of emotions that determines their impact on openness to advice (de Hooge *et al.*, 2014). Both negative self-focused emotions (e.g., shame) and positive other-focused emotions (e.g., gratitude) led to increased openness to advice while positive self-focused emotions (e.g., pride) and negative other-focused emotions (e.g., anger) reduced openness to advice (de Hooge *et al.*, 2014).

Decision-makers' motivations in the decision-making context can also affect their advice-taking. People are thought to be motivated to take advice for two primary reasons – to improve the quality of their decision and to share responsibility for uncertain outcomes. First, people are thought to be motivated to improve their judgment and maximize the accuracy of decisions they face (Dalal and Bonaccio, 2010; Phillips, 1999; Sniezek and Buckley, 1995). Paying heed to knowledgeable advisors enables one to improve one's understanding of the decision and make better choices. Second, people are also thought to be motivated to take advice to reduce the potential negative consequences of committing errors in risky situations (cf. Harvey and Fischer, 1997). The diffusion of responsibility that accompanies advice-taking insulates individual decision-makers from the organizational, social, relational, and psychological consequences associated with making the "wrong" decision (Harvey and Fischer, 1997). People may be inclined to take advice from other individuals to share responsibility for decision outcomes when these outcomes are uncertain and consequential (Harvey and Fischer, 1997; Yaniv, 2004).

Taking advice can provide task-related and social benefits, and there are many reasons for decision-makers to take advice. Nonetheless, research has frequently found that decision-makers often avoid or underutilize advice even when the advice could have improved their decision outcomes (Rader *et al.*, 2017). Thus, considerable research has explored reasons or motivations for taking advice as well as reasons for avoiding or ignoring advice. Gathering, evaluating, and using advice is time-consuming, and may create conflicts or social obligations for the decision-maker. Research indicates that it may be particularly difficult for decision-makers to evaluate the quality of advice in judgmental decision tasks, making the job of discerning good advice from bad more burdensome, and in turn reducing decision-makers' overall propensity to take advice (Ecken and Pibernik, 2016). Taking advice and relinquishing one's decision-making autonomy may be threatening to the self-concept or construed self-image (Rader *et al.*, 2017). Decision-makers may worry that taking advice will reduce their freedom to make a decision that is consistent with their own values, beliefs, or identity (Ashford and Barton, 2007). They may also worry that taking advice will make them appear less competent or less confident in their own judgement (Rader *et al.*, 2017).

Advice-Taking in Ethical Decision-Making

Although not explicitly studied within the advice-taking literature, several studies in the ethical decision-making literature provide insights about the influence others can have on the ethical decision-making process. One of the earliest considerations of the role of others on ethical decision-making within organizations was Trevino's person-situation interactionist model. This model suggests that decision-makers who are field dependent or who exhibit a lower level of cognitive moral development (i.e., Conventional moral development stages 3 and 4) will be more open to influence when they are facing ethical issues (Treviño, 1986). Research has also explored the role of social influence in spreading and maintaining corruption within organizations (Ashforth and Anand, 2003; Bandura, 1999). Finally, the social constructionist model of ethical decision-making (Sonenshein, 2007) posits that ethical issues are recognized and defined through social interaction but moral judgments are made intuitively by individuals.

Within the ethical decision-making literature there are mixed signals as to whether seeking or accepting advice will lead to more or less ethical decisions. On the one hand, researchers have provided theory and research in support of ethical decision support systems such as ethics hotlines, ethics training, and reporting requirements for employees (Kaptein, 1999; Thorne *et al.*, 2004; Lange, 2008). In one study of accounting professionals, seeking advice from a professional body about ethical issues was treated as a measure of ethical behavior in itself (McManus and Subramaniam, 2009). On the other hand, researchers have often implied that individuals who have a strong moral compass will not be influenced by others when making ethical decisions (Trevino, 1986). Empirical research suggests that individuals with a high internal locus of control make more ethical decisions than those with an external locus of control (Street and Street, 2006). Researchers from social psychology and organizational studies have often highlighted the corrupting effect that social influence can have on ethical decision-making in organizations (Ashforth and Anand, 2003; Brief *et al.*, 2001; Vaughan, 1999).

Although ethical decisions are a particular type of decision, they are still decisions after all, thus it seems likely that *good* advice could help improve ethical decision-

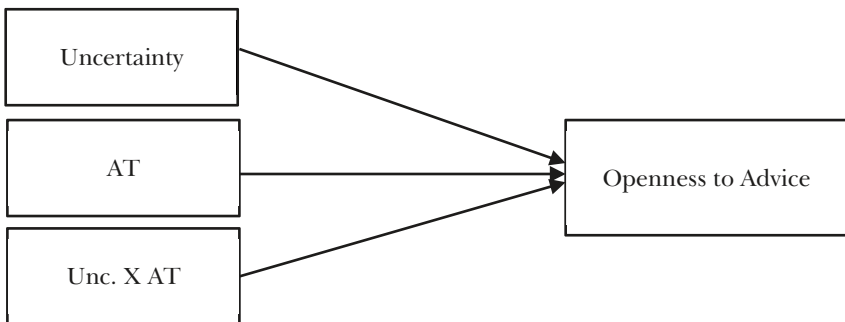
making. However, because ethical decisions are complex judgmental decisions, it may be difficult for decision-makers to distinguish good versus bad advice. Furthermore, while some ethical decision-makers may wish to use good advice in order to improve the quality of their decisions, others may use advice indiscriminately for social validation or to share responsibility for their decisions. In this study two models of advice-taking are developed and tested. The first is based on existing advice-taking research and is referred to as the General Advice-Taking (GAT) model. The second is based on factors specific to ethical decision contexts and is referred to as the Ethical Decision Advice-Taking (EDAT) model. Testing these two models provides insight into whether existing advice-taking research can be generalized to ethical decision contexts or whether more nuanced models are needed to understand advice-taking preferences in ethical decision-making.

THEORY AND HYPOTHESES

General Advice-Taking (GAT) Model

The GAT model, illustrated in Figure I, is a distillation of factors which have been consistently found to influence openness to advice in the advice-taking literature. This model predicts that openness to advice will be influenced by perceived decision characteristics and individual characteristics of the decision-maker. Based on previous research, the GAT model predicts that uncertainty and ambiguity tolerance influence openness to advice and that the relationship between uncertainty and openness to advice will vary as a function of decision-makers' tolerance for ambiguity.

Figure I
Generic Advice-Taking (GAT) Model



Note: Unc. = Uncertainty; AT = Ambiguity Tolerance

Uncertainty is a strong driving force in decision-making in that it provides an occasion for sensemaking (Sonenshein, 2007; Weick, 1995). Uncertainty has been defined in three major ways in the literature: the extent to which decision-makers are unable to predict probabilities of future events or states of the environment; the extent

to which they lack information regarding cause-effect relationships; and the extent to which they are unable to predict the outcomes of their decisions (Milliken, 1987). When people are faced with high levels of state, effect, or response uncertainty, they are thrust into a state of ignorance, which in turn prompts them to engage in “careful discovery” (Weick, 1995: 95), prompting advice-taking. As decision-makers’ perceptions of uncertainty increase, their confidence in their own ability to understand and respond to the decision task decreases, in turn increasing their openness to advice.

Some decision-makers are more comfortable with uncertainty and ambiguity than others, and this characteristic is also likely to influence advice-taking preferences such that ambiguity tolerance will relate negatively to openness to advice. Individuals who are more comfortable with ambiguity are more likely to be confident in their ability to handle the decision independently, whereas individuals who are less tolerant of ambiguity are likely to be less comfortable with the decision task and to look to outside sources for advice. Furthermore, ambiguity tolerance is also likely to moderate the relationship between uncertainty and openness to advice. Specifically, the relationship between uncertainty and openness to advice is likely to be strongest when ambiguity tolerance is low, and much weaker when ambiguity tolerance is high. Individuals who have a high tolerance for ambiguity may still recognize uncertainty in a decision situation but they will be less likely than others to alter their decision-making process and advice-taking preferences as a result of uncertainty. The predictions derived from the GAT models are summarized in the following hypotheses:

Hypothesis 1: Uncertainty is positively related to openness to advice in ethical decision-making.

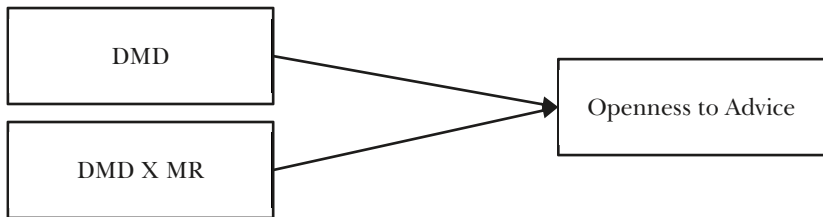
Hypothesis 2: Ambiguity tolerance is negatively related to openness to advice in ethical decision-making.

Hypothesis 3: The positive relationship between uncertainty and openness to advice is stronger (conversely, weaker) when ambiguity tolerance is low (high).

Ethical Decision Advice-Taking (EDAT) Model

Ethical decisions involve the application of moral norms or standards and potentially have negative impacts on stakeholders (Treviño, 1986). Such decisions present unique challenges to decision-makers who must evaluate competing stakeholder claims, and apply moral values and principles to judge between these claims, all the while faced with high levels of uncertainty and difficulty in decision-making (Chia and Lim, 2000; Waters *et al.*, 1986). In the vocabulary of advice-taking research, ethical decisions are inherently judgmental – as opposed to intellective – decision tasks. In judgmental decision-making, evaluations of the quality and value of advice are subjective, and openness to advice is a function of decision-makers’ trust in their own judgment as well as their willingness to trust the judgment of an advisor. The EDAT model, illustrated in Figure II, suggests that factors which are uniquely relevant in ethical decision-making influence openness to advice in ethical decision situations.

Figure II
Ethical Decision Advice-Taking (EDAT) Model



Note: MR = Moral Recognition; DMD = Dispositional Moral Disengagement.

Moral recognition means that a decision-maker understands that a decision has ethical implications and requires a moral judgment, and has often been depicted as a necessary first step of the ethical decision process (Rest, 1986; Jones, 1991). Moral recognition could impact openness to advice-taking in two ways. First, moral recognition may increase decision-makers' perceptions of the importance of the decision. Second, moral recognition may increase decision-makers' concern for the self-concept and construed self-image implications of the decision. On one hand, increased perceptions of a decision's importance should increase a decision-maker's openness to advice. On the other hand, increased concern for one's self-concept and construed self-image is likely to increase a decision-maker's desire for autonomy, and reduce their openness to advice. Thus, the relationship between moral recognition and openness to advice is likely to vary depending on whether moral recognition leads to increased concern for the ethical implications or to increased concern for one's self-concept and image. Ultimately, the relationship between moral recognition and openness to advice may vary depending on the characteristics of decision-makers.

One individual characteristic which is specifically relevant in ethical decision-making is dispositional moral disengagement. Dispositional moral disengagement is a general tendency of individuals to "disengage internalized moral standards" (Kish-Gephart *et al.*, 2014) across situations. According to social cognitive theory, individuals develop standards of moral or ethical behavior through life experiences (Bandura, 1999). These moral standards serve a regulatory role and thus bring about ethical behavior when they are activated (Bandura, 1999). However, certain individual traits have been proposed to make people more likely to disengage their internal moral standards across a broad range of situations (Detert *et al.*, 2008; Moore, 2008).

Dispositional moral disengagement may affect advice-taking preferences in two ways. First, individuals who are morally disengaged may not even recognize the moral or ethical content of situations they are faced with. Second, individuals who recognize the moral content of ethical decisions may use various mechanisms like moral justification, euphemistic labeling, and diffusion of responsibility to diminish their own perceptions of the importance of the ethical implications of the decision (Bandura, 1999). Thus, dispositional moral disengagement systematically affects one's response to ethical situations and one's receptivity to advice in these situations. Individuals with high

levels of dispositional moral disengagement are unlikely to be concerned about the ethical implications of a decision and unconcerned about the quality of their decision. Such individuals are likely to be happy to sacrifice decision-making autonomy in exchange for reducing their own effort and responsibility for the decision. These decision-makers are likely to be motivated to take advice in order to share responsibility rather than improve the quality of their decision. Thus, morally disengaged decision-makers may be open to a broad range of advice (as long as it reduces their own decision-making effort and responsibility) and have little concern for the quality of the advice.

Dispositional moral disengagement is also likely to moderate the relationship between moral recognition and openness to advice. Individuals who are low in dispositional moral disengagement are more sensitive to ethical issues and may be particularly motivated to make a morally correct choice. Since the moral correctness of a choice is largely a function of the social acceptability of that choice and/or the decision process used to arrive at it, these people may become more motivated to seek opinions and consult with experienced people around them as the perceived ethical implications of the decision increase. In contrast, individuals with high dispositional moral disengagement may have a very different approach when they perceive ethical implications of the decision. Disregarding the potential consequences of the decision for stakeholders, these people may worry primarily about their image when faced with an ethical issue. For these individuals increased moral recognition is likely to lead to an increased desire to appear confident and competent in their ability to make an ethical decision. Thus, individuals with high dispositional moral disengagement are likely to become less open to advice as moral recognition increases. The relationships predicted by the EDAT model are summarized in the following hypotheses:

Hypothesis 4: Dispositional moral disengagement is positively related to openness to advice.

Hypothesis 5: Moral recognition and dispositional moral disengagement interact such that individuals with low (high) dispositional moral disengagement become more (less) open to advice as moral recognition increases.

METHOD

Procedure

Experimental vignette methods have been used extensively in the field of behavioral ethics as they enable researchers to study sensitive topics and achieve high levels of internal and external validity at the same time (Aguinis and Bradley, 2014). For this study, realistic and immersive scenarios were used to introduce participants to hypothetical decisions and to study advice-taking preferences. A two-wave scenario-based survey was used to examine the proposed models of advice-taking. In the first wave of the survey, participants were presented with a neutral job-choice scenario followed by measures of the variables of interest. This job choice scenario is a modified version of that administered by Dalal and Bonaccio (2010), where students must decide between five job offers to accept upon graduation. Data from the first wave provided some baseline information and was primarily used for the measurement of dispositional variables (i.e., ambiguity tolerance and dispositional moral disengagement). In the second wave of the survey, an ethical decision-making scenario involving the

discontinuation of a need-based scholarship by a student organization was presented. Following the presentation of the scenario and advice snippets, independent and dependent variables were measured.

Sample

Undergraduate business students (N=155) at a large public university in the southern United States were recruited to participate in the study in exchange for course points. While the use of student samples has been broadly criticized in organizational research, it is appropriate to use student samples in certain situations, especially when studying the relationships between theoretically-relevant variables like ambiguity tolerance and dispositional moral disengagement on ethical decision-making (Randall and Gibson, 1990). Student participants were informed of their rights and were offered reasonable alternative opportunities to gain the course points offered for the study. Out of the 155 students who participated in the first wave, 134 students also participated in the second wave of the survey. Four responses were dropped due to large amounts of missing data, yielding an overall response rate of 83.9%. There were no significant differences in age, sex, or years of work experience between participants who responded to the second wave and those who dropped out after the first wave of the study.

Measures

Ambiguity Tolerance. Ambiguity tolerance was measured using 13 items from the MSTAT-II scale developed and refined by McLain (2009). Three sample items are “I try to avoid situations that are ambiguous,” “I find it hard to make a choice when the outcome is uncertain,” and “I generally prefer novelty over familiarity,” rated on five-point Likert scales from 1 = Strongly Disagree to 5 = Strongly Agree. Cronbach’s alpha for the measure was 0.85.

Dispositional Moral Disengagement. Dispositional moral disengagement was measured using eight items from Detert and colleagues’ (2008) 24-item scale that tapped into eight distinct moral disengagement mechanisms (Martin *et al.*, 2014). These items were slightly modified to fit the decision-making context. Two sample items are “Some people have to be treated roughly because they lack feelings that can be hurt” and “Taking something without the owner’s permission is okay as long as you’re just borrowing it,” rated on five-point Likert scales anchored from 1 = Strongly Disagree to 5 = Strongly Agree. Alpha for the scale was 0.86.

Uncertainty. Uncertainty was measured using six items developed by Franklin *et al.* (2013), building on Milliken’s (1987) definition of the construct. Sample items are “The consequences of my decision are not clear” and “I cannot predict how my decision will play out,” rated on five-point Likert scales anchored from 1 = Strongly Disagree to 5 = Strongly Agree. Alpha for the scale was 0.83.

Moral Recognition. Moral recognition was measured using five items developed for the study from Butterfield *et al.*’s (2000) definition of the construct. Two sample items are “There is some party that is harmed no matter what decision I make” and “Welfare of some student might be negatively affected by my decision,” both rated on five-point Likert scales anchored from 1 = Strongly Disagree to 5 = Strongly Agree. Alpha for the measure was 0.92. A measure of perceived moral intensity was used to establish the nomological validity of the scale. Specifically, as per Jones’ (1991) issue-contingent

model of ethical decision-making, there ought to be a moderately strong positive correlation between perceived issue characteristics (i.e., magnitude of consequences, social consensus, probability of effect, temporal immediacy, proximity and concentration of effect; Jones, 1991) and moral recognition. Perceived moral intensity was measured using six items developed from Jones' (1991) definition. Two sample items are "There is very small likelihood that my decision will actually cause harm" and "My decision will not cause harm in the immediate future" (both reverse coded) rated on five-point Likert scales anchored from 1 = Strongly Disagree to 5 = Strongly Agree ($\alpha = 0.71$). As expected, perceived moral intensity strongly correlated with moral recognition, $r = 0.56$, $p < 0.01$, lending evidence towards construct validity.

Openness to Recommendations. Following the presentation of recommendation-for and recommendation-against advice snippets, openness to recommendations was measured using two four-item scales developed by Dalal and Bonaccio (2010). Sample items are "How satisfied would you be with this interaction?" and "How useful would this interaction be for you?" rated on five-point Likert scales anchored from 1 = Not at all to 5 = Extremely. Cronbach's alpha for the scale was 0.95. Using data from the first wave of the study, a principal axis exploratory factor analysis was performed with Varimax rotation on the eight items. As expected, one factor emerged, explaining 68.66% of variance in the items. A visual examination of the Scree plot also confirmed the one-factor solution. Factor loadings of individual items varied from 0.79 to 0.89, supporting the unidimensionality of the measure.

RESULTS AND DISCUSSION

The correlations between the measured variables are presented in Table 1. Openness to recommendations was negatively correlated with moral recognition, and positively correlated with dispositional moral disengagement. Further, moral recognition and dispositional moral disengagement were negatively correlated with each other, indicating a rather complex relationship between these two variables and the dependent variable. Uncertainty and ambiguity tolerance were not significantly correlated with openness to recommendations. These correlations suggest that openness to advice in ethical decision-making relate significantly to factors in the EDAT model but not those in the GAT model.

Hypotheses were tested by regressing openness to recommendations on the centered main effect and interaction terms (Cohen *et al.*, 2013). Hypothesis 1 predicted a positive main effect of uncertainty on openness to advice. Hypothesis 2 predicted that ambiguity tolerance would be negatively related to openness to advice, and Hypothesis 3 predicted that the strength of the relationship between uncertainty and openness to advice would be moderated by ambiguity tolerance. Results of this regression analysis are presented in Table 2. The main effect model ($R^2 = 0.02$, $F(2,127) = 1.40$, $p > 0.10$) and the interaction model ($\Delta R^2 = 0.01$, $F_{\text{change}}(1,126) = 1.20$, $p > 0.10$) failed to significantly explain variance in openness to recommendations. Although the coefficients of variables in this model were in the expected directions, none of them were statistically significant. As such, the GAT model and Hypotheses 1, 2, and 3 did not receive support in the ethical decision-making context.

Table 1
Descriptive Statistics and Correlations

Variable	M	SD	1	2	3	4
1. Ambiguity Tolerance	3.26	0.54				
2. DMD	1.82	0.70	-0.25**			
3. Moral Recognition	4.23	0.66	0.14	-0.23**		
4. Uncertainty	3.29	0.79	-0.07	0.00	0.43**	
5. Openness to Recommendations	1.74	0.77	-0.14	0.32**	-0.15 [†]	0.05

Note: N = 130. DMD = Dispositional Moral Disengagement. M = Mean. SD = Standard Deviation.

[†] p < 0.1, * p < 0.05, ** p < 0.01

Table 2
Regression Results: General Advice-Taking (GAT) Model

Variables	Main Effect	Interaction
Uncertainty	0.04	0.02
Ambiguity Tolerance	-0.14	-0.12
AT X Uncertainty		-0.10
R ²	0.02	0.03
ΔR ²	0.02	0.01
F _{change}	1.40	1.20

Note: Standardized Beta coefficients are reported.

[†] p < 0.1, * p < 0.05, ** p < 0.01

Hypothesis 4 predicted that openness to advice would be positively related to dispositional moral disengagement, and Hypothesis 5 predicted that the relationship between moral recognition and openness to advice would be positive for individuals with low dispositional moral disengagement and negative for those with high dispositional moral disengagement. As before, these hypotheses were tested by regressing openness to recommendations on the centered main effect and interaction terms. Results of this analysis are presented in Table 3. As predicted, the relationship between dispositional moral disengagement and openness to advice is positive and significant ($\beta = 0.30$, $p < 0.01$) lending support to Hypothesis 4. The interaction model ($\Delta R^2 = 0.05$, $F_{\text{change}}(1,126) = 6.81$, $p < 0.05$) significantly explained variance in openness to recommendations,

beyond that accounted for by the main effect model ($R^2 = 0.11$, $F(2,127) = 7.73$, $p < 0.01$). Interactions were plotted to aid in the interpretation of results. As seen in Figure III, the relationship between moral recognition and openness to advice is positive for individuals with low dispositional moral disengagement and negative for those with high dispositional moral disengagement.

This study provides novel insights about the impact of situational and individual factors on decision-makers' willingness to take advice when faced with ethical decisions. First, it is noteworthy that the EDAT model captures factors which influence openness to recommendations in ethical decision situations whereas the GAT model does not. Previous research has often focused on the impact of uncertainty and difficulty on decision-makers' advice-taking behaviors (e.g., Gino and Moore, 2007; Lipshitz and Strauss, 1997), but these studies have not explicitly explored advice-taking in *ethical* situations. Results from this study demonstrating a relationship between factors specific to ethical decision-making and openness to recommendations suggest there may in fact be important differences between the drivers of advice-taking in ethical and non-ethical situations. Future work should focus on understanding the differences in advice-taking behaviors in ethical versus non-ethical decisions. What types of advice do people prefer in ethical decision-making? Do advice preferences change with an increase in moral intensity of the decision? Does advice from internal organizational stakeholders versus external stakeholders systematically affect the quality or acceptability of the final decision? If so, how can managers encourage advice-taking in ethical decision-making, and how might researchers help decision-makers recognize and use good advice when faced with ethical decisions? These lines of inquiry will help advance researchers' understanding of interpersonal and social influences in ethical decision-making – an area that has been somewhat ignored in the behavioral ethics field (see Treviño *et al.*, 2014).

Table 3
Regression Results: Ethical Decision Advice-Taking (EDAT) Model

Variables	Main Effect	Interaction
Moral Recognition	-0.08	-0.07
DMD	0.30**	0.27**
DMD X Moral Recognition		-0.22**
R^2	0.11**	0.15**
ΔR^2	0.11**	0.05*
F_{change}	7.73**	6.81*

Note: Standardized Beta coefficients are reported. DMD = Dispositional Moral Disengagement

† $p < 0.1$, * $p < 0.05$, ** $p < 0.01$

Figure III
Interaction between Moral Recognition and DMD



Note: DMD = Dispositional Moral Disengagement

Next, it is also noteworthy that dispositional moral disengagement influences openness to advice and moderates the relationship between moral recognition and openness to recommendations. Organizations often implement ethical decision support systems in order to increase the quality and reliability of ethical decision outcomes within the organization (see Mathieson, 2007). Such support systems may be informal, relying on information and advice networks to ensure that organization members understand and follow relevant norms when facing ethical decisions. In other cases, ethical decision support systems may be formal, relying on codified policies and procedures to ensure that ethical issues are referred to the appropriate individuals and handled consistently. Informal ethical decision support systems are especially reliant on individuals' willingness to seek and take advice regarding ethical issues, and even with formal ethical decision systems there is a risk that individuals may not recognize ethical issues or may choose to ignore such issues even when they are noticed. Results of this study suggest that those decision-makers who are least concerned about the ethical implications of their decisions may be the most likely to use such advice systems, thus ensuring that these systems provide high quality advice may improve ethical decision outcomes.

Findings further suggest that managers should consider individual differences which impact openness to advice when designing and implementing ethical decision support systems. Of course, the specific designs of such systems would depend on the goals of the organization. If the organization wants to ensure that ethical decisions are handled efficiently and consistently, finding ways to encourage individuals to seek and accept recommendations from knowledgeable advisers may be important. Many interesting research questions come to light. Can incentive systems be used to supersede individual differences and ensure employee engagement with ethical decision support

systems? If the organization wants to override these individual differences and encourage creativity in ethical decision-making, should managers find ways to encourage moral dialogue that is perhaps not designed to lead to an immediate recommendation? Answers to these questions may be helpful to organizations seeking to implement ethical decision support systems.

The nature of the interaction between dispositional moral disengagement and moral recognition in influencing advice-taking is also interesting for several reasons. The slopes of the relationships demonstrate that individuals with high levels of dispositional moral disengagement become less open to recommendations as moral recognition becomes stronger, whereas individuals with low levels of dispositional moral disengagement become more open to recommendations as moral recognition becomes stronger. It is notable that overall, individuals with high levels of moral disengagement are more open to advice in ethical decisions than their counterparts with low levels of dispositional moral disengagement. While additional research is needed to fully understand this relationship, it may suggest that morally disengaged individuals are more content to take recommendations in order to reduce their personal responsibility for an ethical decision or to simply reduce their own effort and deliberation in making a choice. An interesting avenue for future research would be to examine groups consisting of one or more morally disengaged individuals. Since most organizational decisions are made in a group context, there is reason to believe that morally disengaged individuals may have disruptive influences on group ethical decision-making.

Overall, this study suggests that it should not be assumed that previous advice-taking research will generalize to ethical decision-making. Instead, advice-taking preferences and behaviors in ethical decisions are influenced by factors uniquely relevant to ethical decision situations. Additionally, concepts related to behavioral ethics and decision-making organizations such as self-serving bias, overconfidence bias, groupthink, peer pressure, and information processing may provide valuable insights into the processes by which decision-makers seek, evaluate, and use advice when faced with ethical decisions. This study provides novel information about factors that influence openness to advice in ethical decision-making as well as a clear foundation for additional research exploring advice-taking in ethical decision-making.

Limitations and Directions for Future Research

The motivation of this study was not to comprehensively answer all questions about advice-taking in ethical decision-making. Instead, the motivation was to test whether unique factors affect advice-taking in ethical, as opposed to non-ethical, decision-making. Findings suggest that unique factors do play a role in shaping advice-taking preferences in ethical decision-making. Despite its unique contributions to understanding advice-taking in ethical dilemmas, this study has certain limitations that need to be addressed. First, this study used a vignette to analyze responses to a hypothetical ethical dilemma. While experimental vignette methods are often used to study responses to ethical dilemmas in the field of behavioral ethics (see Kish-Gephart *et al.*, 2014), this methodology is limited by its lack of realism (McGrath, 1984). Efforts were taken to make the decision scenarios as realistic as possible, but it is plausible that participants may respond differently to hypothetical decision tasks compared to real-world decisions. Also, ethical issues can vary across many dimensions, including the extent to which they are judgmental or intellectual in nature. The use of just one ethical

decision task in the current study limits its ability to discern the impact of other characteristics of ethical issues on advice-taking. Future research could explore how various characteristics of ethical decisions impact advice-taking. Additionally, although openness to advice is a relevant outcome, this study does not provide direct information about the extent to which decision-makers will ultimately be influenced by advice. Future research might use alternative methods (e.g., a natural experiment) and/or measures (e.g., advice-taking behavior) to study advice-taking in ethical decision-making.

Second, in the current study, advice was operationalized as recommendations for or against particular choice options. While this is in line with much of the previous advice-taking research, Bonaccio and Dalal (2006) emphasize that recommendations are but one of several types of advice that might be given. Other forms of advice include information about options, information or suggestions about how to go about making the decision (i.e., decision process support), and social support. Previous research suggests that supporting information is particularly important in judgmental decision tasks (Ecken and Pibernik, 2016; Tzioti *et al.*, 2014). This suggests that decision-makers facing ethical issues might react more favorably to information about options than to simple, unsupported recommendations. Future research could explore differences in ethical decision-makers' openness to various types of advice.

Third, while this study explores the impact of dispositional moral disengagement on openness to advice in ethical decision-making, it is likely that other decision-maker characteristics also impact openness to advice. Following the contours of research in advice-taking, research in the ethical decision-making context could explore additional decision-maker and advisor characteristics on advice-taking in ethical decision-making. Decision-maker characteristics which have been explored in the ethical decision-making literature such as locus of control, cognitive moral development, and Machiavellianism may be worth exploring. It is also possible that links may exist between openness to advice and demographic characteristics such as age, gender, tenure in an organization or profession, and education.

Future research could also explore the impact of advisor characteristics on openness to advice in ethical decision-making. Previous research has found that openness to advice can be impacted by the perceived expertise of the advisor as well as similarity between the advisor and the decision-maker. It seems likely that ethical decision-makers may be more open to advice from advisors who they believe share their own values. This may be particularly true among ethically-sensitive decision-makers who are concerned with making a decision with which they feel morally comfortable. Decision-makers with high dispositional moral disengagement may be more concerned with making decisions that will be accepted by other members of the organization and may prefer advice from someone in a position of authority or someone who is held in high esteem within the organization. Future research could explore the impact of these characteristics on openness to advice and could also seek to understand how ethical decision-makers evaluate the values or expertise of advisors in an ethical decision context. Additionally, since ethical decisions often affect stakeholders outside of the organization, it would be valuable to understand factors that influence decision-makers' openness to advice from external parties.

Finally, future research should seek to understand if or when taking advice improves the quality of ethical decision-making. First, research should seek to understand the conditions under which ethical decision-makers actually use advice.

While previous advice-taking studies have used objective decision scenarios in order to quantitatively measure the weight of advice, ethical decisions do not lend themselves to such straightforward measures of the extent to which decision-makers use advice. Thus, researchers will need to explore more creative and nuanced ways to examine the extent to which advice impacts ethical decisions. One option might be to ask the decision-maker to explain the thought process behind their decision after they have made a choice. This could provide insight into how much consideration decision-makers gave to advice and whether they ultimately acquiesced to the advice or not. Such a technique might even provide insight into whether the decision-maker would have preferred another type of advice or advice from additional sources as well. Next, research should explore the impact of advice on decision outcomes. Does advice help decision-makers recognize additional options? Does taking advice lead to more positive perceptions of the decision process and outcome from the perspective of the decision-maker or other audiences? Understanding the impact of advice on ethical decision outcomes will be foundational to the development of effective ethical decision support systems in organizations.

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