

Subcertification and Relationship Quality: Effects on Subordinate Effort and Justification

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ABSTRACT: This study examines the decision to implement subcertification, a system of certifications of financial data by the subordinate employees who provide that data. Subcertification is intended to increase employee effort to ensure that the reported financial data is accurate and can be defended. I experimentally explore the effects of subcertification on subordinate effort and justification when generating an accounting estimate, predicting that both will increase. Despite the expected benefits of imposing subcertification, it has not been universally adopted. One widely-cited reason for not adopting is concern about the impact on corporate culture and manager-subordinate relationships. I document the direct effects of relationship quality between a manager and subordinate on subordinate behavior, expecting a higher quality relationship to lead to increased effort and justification. In this draft, I provide pilot data consistent with relationship quality directly affecting the amount of effort participants exert in researching the appropriate accounting estimate. I subsequently document the effects of the decision to subcertify on relationship quality, predicting that subordinate response depends upon the existing manager-subordinate relationship. Collectively, the expected findings of this study are of particular importance to managerial accountants in practice who are charged with control system design and implementation decisions. Further, to the extent that greater effort yields higher quality estimates and, in turn, higher quality financial statements, this study has implications for the internal financial reporting process as well.

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I. INTRODUCTION

With the personal certification requirements of Sections 302 and 906 of the Sarbanes-Oxley Act of 2002 (United States Congress 2002), top executives at publicly-traded firms face increased accountability for financial statement veracity (AFP 2003a; Alles and Datar 2003; Donaldson 2003; Geiger and Taylor III 2003). One response to this requirement seen in practice is the adoption of subcertification, a system of internal certifications of financial data by the subordinate employees who provide that data (AFP 2003a; Geiger and Taylor III 2003). The expectation of managers adopting subcertification is that the increased accountability will lead to greater effort by the subordinate to ensure that the financial data they provide is accurate (AFP 2003b; Taub 2003).

Subcertification increases the potential cost associated with providing intentionally or unintentionally inaccurate data, so it is likely that subordinate employees will exert greater effort and more fully justify their decisions when asked to certify their work (Jensen and Meckling 1976; Lerner and Tetlock 1999; Koonce, et. al.1995). I test these expectations experimentally by manipulating the presence of a subcertification requirement when a subordinate is tasked with estimating the adjustment to Allowance for Doubtful Accounts. I hypothesize that subordinates who subcertify will exert more effort to determine the appropriate estimate. I also hypothesize that subcertifying subordinates will offer more justification for the estimate generated in an attempt to demonstrate diligence to the manager.

If adopting subcertification offered only benefits, in the form of greater effort and justification, the expectation would be that subcertification would be adopted more-or-

less universally, across all levels of all organizations. This has not been the case. Survey data collected by the Association for Financial Professionals (AFP) and the Institute of Internal Auditors (IIA) reveals that subcertification has been adopted to varying degrees (AFP 2003; IIA 2004). In the 2003 AFP poll, 34 percent of responding individuals report that they are required to subcertify financial data. The positions of those subcertifying include treasurer, director, controller and analyst (AFP 2003). The 2004 IIA poll shows results similar to those of the AFP, with a wide variety of positions subcertifying at different rates (IIA 2004). This disparity in adoption policies is exemplified by Accounting Policy 71.1 of the University of Texas System, which states “each institution’s Financial Reporting Officer should decide at what level the subcertification is required...” (University of Texas System 2005).

This disparity in adoption suggests that, in most cases, managers are making case-by-case decisions whether to adopt subcertification and are concerned with the potential associated costs. These costs likely come in the form of negative effects on morale, corporate culture and the relationships between manager and subordinate (Gieger and Taylor III 2003; Graen and Uhl-Bien 1995). This is substantiated by Bruce Nelson, then CEO of Office Depot, who refused to consider subcertification because it “...could be interpreted as the CEO and CFO giving away their responsibility” (Perez 2002). The 2003 AFP survey also found that nearly seventy percent of respondents required to subcertify expressed ‘moderate’ or ‘serious’ concern about risks associated with signing and one quarter of those signing had sought legal advice (AFP 2003). The AFP itself advocates awareness of the stress caused by the adoption of SOX and subcertification (Conrad 2003) and some law firms that suggest consideration of a subcertification system

also warn of the potential impact on corporate culture and morale (Vinson and Elkins 2002).

Concern about damaging relationships in an organization presumes some value to undamaged relationships; that in a financial reporting task, a better manager-subordinate relationship could yield more effort on the part of the subordinate to ensure that the reported numbers are correct. This leads to the second question I examine in this study: does relationship quality affect subordinate effort and justification in the financial reporting process? I draw upon the leader-member exchange (LMX) literature to measure the quality of the relationship between a manager and subordinate. In turn, I examine the impact of LMX quality on subordinate effort and decision justification.

Existing LMX research has shown that a high quality LMX is characterized in part by mutual trust and heightened loyalty (Graen and Uhl-Bien 1995). In the setting I consider, “trustworthy” and “loyal” suggests exerting effort to ensure that the accounting numbers are correct and fully justified. As a result, I hypothesize that a high quality LMX subordinate will exert more costly effort and provide more justification than low quality LMX subordinates when generating the estimate to adjust the Allowance for Doubtful Accounts.

Given that the concern in practice is that the benefits of the imposition of subcertification may be offset by damage to the organization, I next consider how the imposition of subcertification affects LMX quality. A high quality LMX relationship is characterized by a relatively high degree of mutual trust (Gerstner and Day 1997). Given that the accountability literature has consistently shown that the imposition of a control is perceived by the subordinate as a signal of a lack of trust (see Christ, et. al. 2005; Enzle

and Anderson 1993; Falk and Kosfeld 2005), there is reason to expect the adoption of subcertification will negatively impact LMX quality, undoing at least some portion of the relationship-based effects. In this setting, subcertification and LMX quality act as substitutes in affecting subordinate behavior.

The substitute effect is due to the trust signal that is contained in the decision to subcertify. If this is the case, I argue that the information in the signal depends upon the existing LMX quality when subcertification is adopted. If an LMX is of high quality, characterized by relatively high mutual trust, adopting subcertification will be perceived as a signal of a lack of trust, reducing LMX quality. Given that I find that LMX quality is positively related to effort and justification, I hypothesize that damaging a high quality LMX will at least partially offset the benefits of imposing subcertification. In addition, if the subordinate views adoption as a particularly strong signal of mistrust, the damage to the relationship could exceed the benefits of imposing subcertification.

A subordinate in a low quality LMX, characterized by a relatively low expectation of trust on the part of the subordinate, will perceive *not* adopting subcertification as a signal of trust. However, the subordinate must be made aware that the control was considered and not adopted; if the subordinate does not know, there is no signal. Signals of trust tend to be reciprocated with trustworthy behavior (Berg, et. al. 1995; Camerer 2005, p.86) and prior research provides evidence that signals of trust from a manager can serve to initiate a positive feedback loop of trust and trustworthy behavior (Whitener, et. al. 1998). As a result, I hypothesize that, among low quality LMX subordinates who are *not* asked to subcertify, those that are aware the manager could have imposed subcertification but did not, will report a higher LMX than those that are

not aware. In turn, effort and justification will be higher among those subordinates, as well.

With this study I contribute to the burgeoning accounting literature exploring trust and organizational variables in affecting behavior (see Christ et. al. 2006; Colletti, et. al. 2005; Rowe 2004; Towry 2003). I extend this literature by documenting how adoption of an explicit accounting control, subcertification, can have different effects on subordinate effort and justification depending upon the existing relationship quality. In addition, I document how the quality of relationship between a manager and subordinate *directly* affects effort and justification in the internal financial reporting process. Finally, I explore how imposition of subcertification affects the relationships in an organization and the behavioral consequences, answering the call of Geiger and Taylor (2003) to explore the “effects of CEOs requiring subordinate certification of financial results on psychological factors”.

At a practical level, this study provides evidence on potential costs and benefits of adopting subcertification. There is concern about the costs and benefits of implementing subcertification in practice and I document settings where adoption yields behavioral improvements, as well as settings where *not* adopting will yield similar results. Further, the findings presented here can be generalized to similar controls with equivalent predictions. As such, this study is of particular interest to managerial accountants charged with control system design and implementation.

In the next section I more fully describe the theories applied in this study and the specific hypotheses derived. In section three I discuss the experimental methodology used to test the hypotheses. Section four contains pilot results and section five concludes.

II. THEORY AND HYPOTHESES

I draw chiefly upon two theories to develop predictions about subordinate behavior; accountability and leader-member exchange (LMX). I first discuss my application of accountability research and the expected direct effects of imposing subcertification on subordinate effort and justification. I then do the same for the expected direct effects of LMX quality and the interaction of subcertification and LMX quality. The theoretical model is presented in Figure 1 and the hypothesized effects are summarized in Figure 2.

Accountability

I use the definition of accountability offered by Lerner and Tetlock (1999): “The implicit or explicit expectation that one may be called upon to justify one’s beliefs, feelings, and actions to others” and that a lack of adequate justification may lead to negative repercussions for the accountable individual. This includes the potential loss of wealth, reputation, employment or freedom.

By this definition, the process of subcertification represents an imposition of accountability. In practice, signing individuals face greater responsibility, certainly internally and potentially in the external legal system, for the decisions expressed in the financial statements than those who do not. Internally, the requirement to sign implies that the manager considers the product important and that there exists the need to justify the reported numbers. Externally, a signer may become more visible to auditors and regulators who decide to investigate the financial reports. While the legal exposure

created by subcertification has not yet been tested in court, subcertification is suggested as part of a liability defense for executives (see Baxter 2004; Perkins Coie 2002) and subordinates who are signing in practice are seeking legal advice about the liability associated with signing (AFP 2003a).

The response to accountability depends upon various factors, such as whether there is a clear correct course of action and whether the desires of the person to whom an individual is accountable are known (Gibbins and Newton 1994). In the setting I consider, the manager is assumed to want an accurate estimate and this is known by the subordinate. However, it is not clear what the most accurate estimate should be, nor is it clear how to reach that estimate. Accountability in this type of setting has been shown to motivate cognitive effort and the consideration of a wider range of data (Tetlock 1985). This occurs because the accountable individual expects to have to justify their actions and so must first seek out and identify a reasonably defensible action among the available options.

Koonce et. al. (1995) explore the effect of accountability on auditor justification during the audit planning stage. This setting is similar to the financial reporting setting I consider in that there is neither a clear correct outcome nor a single correct way to undertake the task (Koonce et. al. 1995). They find that auditors in an accountability setting generate more justifications for their decisions than those in a non-accountability setting. The rationale is related to the motivation for greater effort; it is in the interest of the accountable individual to share more information to demonstrate that alternatives were considered and to defend the chosen course of action (Koonce et. al 1995; Tetlock

1985). This leads me to my first hypothesis regarding the direct effects of subcertification:

H1: Subordinates in the subcertification condition will exert more effort to identify an accurate accounting estimate and provide more justification for that estimate than subordinates in the non-subcertification setting.

Leader Member Exchange

Leader member exchange (LMX) emerged in the mid-1970s as an alternative to the prevailing view that managers employ an ‘average leadership style’ across all subordinates (Dansereau et. al. 1975). LMX instead examines leadership by focusing on the different characteristics of relationships that develop in individual manager-subordinate dyads (Graen and Uhl-Bien 1995). Initially, LMX was exclusively a binary ‘in-group’ versus ‘out-group’ construct. After considering the characteristics of the relationship, each subordinate is designated either a member of the manager’s in-group or not. Over time, the measure has developed into a continuous spectrum that can be thought of as representing relative ‘in-ness’.

A wide range of manager-subordinate relationships have been observed in practice and they are placed on a continuum from ‘low quality’ to ‘high quality’. A high quality LMX is characterized by, among other qualities, reciprocal influence, mutual trust, respect and liking (Liden and Maslyn 1998). Low quality LMX relationships are based more strictly on employment contracts where subordinates are unable to influence their manager, operate in role-defined relationships (i.e. there is crisp segregation between hierarchy levels) and have a sense of relatively loosely-coupled fate with the manager (Duchon et. al 1986; Liden and Maslyn 1998). Low quality LMX subordinates

perform their job, but offer nothing extra, while high quality subordinates are more likely to contribute beyond the fundamental job description (Brower, et. al. 2000).

LMX theory asserts, and research has supported, that LMX quality is associated with important organizational objectives and characteristics. Studies have shown LMX to be negatively related to employee turnover (Graen et. al 1982) and positively related to job satisfaction (Stepina et. al 1991), subordinate loyalty (Scandura and Graen 1984), innovation (Basu and Green 1997) and performance (Lagace 1990; Dunegan et. al. 1992). The benefits to the organization of increasing the percentage of high quality LMX relationships have also been documented (Uhl-Bien and Graen 1992, 1993). Given these findings, there is potentially significant cost associated with damaging leader-member exchange quality.

In the specific setting I consider, the manager desires accurate financial reports.¹ 'Effort' in turn is the amount of research and cognitive energy a subordinate is willing to contribute to ensure that the accounting estimate provided to the manager is accurate. There are several reasons to believe that subordinates in a high quality LMX will exert greater effort and provide greater justification than low quality LMX subordinates.

LMX has been linked to objective measures of performance on tasks such as the number of cases processed (Graen, et. al. 1982) and total sales in dollars (Tanner and Castleberry 1990). While I am not aware of any LMX studies that explicitly measure the amount of effort exerted by a subordinate, these results do imply greater effort on the part

¹ A separate research question under development is whether a subordinate will be complicit in deliberately generating misleading information when the manager desires to mislead. In the current study, I do not manipulate the desires of the manager and make the explicit assumption that post-SOX managers, on average, desire accurate reporting.

of subordinates in high quality LMX relationships. If this is the case, I should observe more effort in the high LMX subordinates in my setting as well.

The presence of a relatively high degree of mutual trust in a high LMX relationship also suggests greater effort.² A wide range of studies have shown that those who perceive they are trusted tend to reciprocate by being more trustworthy in return (Camerer 2003) and a subordinate in a high LMX setting believes the manager has a relatively high degree of trust. As a result, I expect the subordinate to respond by exhibiting trustworthy behavior. In this setting, trustworthy behavior is exerting effort to ensure that the estimate is accurate. In addition, subordinates who trust a manager have been shown to be more committed to achieving the goals of that manager (Dirks and Ferrin 2002). In this case the goal is an accurate report, so this should also lead to greater effort to discover the appropriate estimate.

Finally, low quality LMX subordinates operate based on the specifics of an employment contract and are relatively less-inclined to provide extra effort (Liden and Maslyn 1998). This is consistent with low quality LMX subordinates framing the given task as a business transaction where external incentives such as compensation and threats of punishment are considered heavily (Pfeffer 1994; Tenbrunsel and Messick 1999). As a result, a low quality LMX subordinate will be inclined to exert minimal effort, minimizing personal costs.

In contrast, high quality LMX subordinates operate in a more social fashion with their manager and tends to be more willing to contribute beyond their minimally required

² Throughout this study, the definition of trust used is that offered by Meyer, et. al. (1995): “The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party.”

duties (Liden and Maslyn 1998). The manager is trusted, liked and respected and I argue the subordinate will frame a given request from that manager as a social interaction where social norms such as trustworthy behavior are dominant (Tenbrunsel and Messick 1999; Pfeffer 1994). This social contract is further reason to believe a high LMX subordinate will exert greater effort to ensure the manager's objective is achieved. In addition, the high LMX subordinate will demonstrate this trustworthy behavior by offering greater justification. Given that the manager takes responsibility for the financial statements, greater justification also serves to provide the manager with data to support the financial statements should they be questioned.

H2: Subordinates in a high quality LMX relationship will exert more effort to identify an accurate accounting estimate and provide more justification for that estimate than subordinates in a low quality LMX relationship.

Interaction of LMX and Subcertification

I first discuss predicted subordinate behavior when subcertification *is not* implemented, followed by discussion of behavior when subcertification *is* implemented.

Subcertification Not Implemented

There are two ways for a manager to *not* adopt subcertification. The decision can be made without the knowledge of the subordinate, or the subordinate can in some way be informed that a choice was made to forego subcertification. The latter signals to the subordinate that the subordinate is trusted. The manager is demonstrating a willingness to sacrifice a mechanism to monitor or otherwise constrain the subordinate, believing that the subordinate will comply with the expectations of the manager without it.

If a subordinate expects to be trusted, as is the case in the high quality LMX (Liden and Maslyn 1998), this decision to forego subcertification has relatively little signal value as it is consistent with expectations. However, to a subordinate in a low quality LMX, this decision to not implement has the potential to be a relatively strong signal as there is little expectation of trust. The manager is making himself more vulnerable to the actions of the subordinate when the manager has no reason. Existing research has shown that an overture of trust by a manager is a means of establishing and developing mutual trust (Whitener, et. al. 1998). Given that trust is a key component of LMX quality, this is expected to lead to higher reported LMX quality. As a result, I expect that making a low quality LMX subordinate aware that subcertification could have been adopted, but was not, will lead to a higher measure of LMX quality.

I do not expect to see a similar change in the high quality LMX subordinates. This is because a high quality LMX subordinate, by definition, expects to be trusted by the manager. As a result, the decision to *not* impose a control is consistent with expectations and is not an incremental signal of trust.

H3a: Among **low quality** LMX subordinates who are *not* required to subcertify, those who are informed of the decision to forego subcertification will report a higher ending **LMX quality** than those who are not informed.

H3b: Among **high quality** LMX subordinates who are *not* required to subcertify, those who are informed of the decision to forego subcertification will report an ending **LMX quality** similar to those who are not informed.

If LMX quality is found to have a direct effect on effort and justification, this suggests that low quality LMX subordinate effort and justification will increase when

subcertification is *not* adopted while there will be no effect on high quality LMX subordinates.

H4a: Among **low quality** LMX subordinates who are *not* required to subcertify, those who are informed of the decision to forego subcertification will exert greater **effort** and provide greater **justification** than those who are not informed.

H4b: Among **high quality** LMX subordinates who are *not* required to subcertify, those who are informed of the decision to forego subcertification will exert **effort** and provide **justification** similar to those who are not informed.

Subcertification Implemented

Where *not* implementing a control is a signal of trust, implementing a control is a signal of a lack of trust (see Enzle and Anderson 1993; Falk and Kosfeld 2005; Zaheer and Venkatraman 1995; Zaheer et. al. 1998). As such, whether this signal matters depends upon the existing expectation of trust. In a low quality LMX, the subordinate has a relatively low expectation of trust so the decision to implement subcertification contains relatively little information and is not expected to affect the quality of the LMX. As a result, for the low LMX subordinates, I expect to observe no difference in LMX measure between a) those subordinates not required to sign and are not informed of the decision and b) those that are required to sign.

If LMX quality is found to have a direct effect on effort and justification, this suggests that low quality LMX subordinate effort and justification will increase when subcertification is adopted. In other words, because subcertification has no effect on LMX quality for low quality LMX subordinates, the direct effects of subcertification, increased effort and justification, will be observed.

H5: Subordinates in a **low quality** LMX who are required to provide subcertification will report LMX quality similar to those who are not required to sign and are not informed of the decision.

H6: Subordinates in a **low quality** LMX who are required to subcertify will exert greater **effort** and provide greater **justification** than those who are not required to sign and are not informed of the decision.

The effect of subcertification when LMX quality is high is more complicated as this is the condition in which the effects of accountability and LMX directly conflict. There is pressure from subcertification to increase effort and provide more information. However, when LMX quality is high, this effect is predicted to be offset by damage to the LMX quality, which is also expected to increase subordinate effort and justification. The dominant effect is determined by the strength of the trust signal perceived by the subordinate.

At one extreme, there is the possibility that a subordinate in a high quality relationship will simply accept any protocol handed down from a respected and trusted manager. If this is the case, there is no signal value to the decision to adopt subcertification, there is no damage to the LMX and there is no associated reduction in effort and justification. However, given that the high quality LMX subordinate is already expected to exert a relatively high level of effort and offer greater justification, this would suggest no benefit to adopting subcertification.

At the other extreme, there is the possibility that the high quality LMX subordinate will be significantly offended by the decision to require subcertification. Not only does the decision to subcertify imply to the subordinate that there is a lack of trust, the imposition of the control will also cause the subordinate to frame the overall task differently (Tenbrunsel and Messick 1999). I expect a high quality LMX subordinate to

be relatively concerned with the situation faced by the manager and to psychologically frame the task of generating accurate financial statements as collaboration with a team member who is relying on a high level of effort. As such, the behavior of the subordinate will be governed by intrinsic social norms such as trustworthiness and reciprocity (Tenbrunsel and Messick 1999).

The introduction of a control has been found to shift individuals out of this type of “social norm” frame and into a “business” frame, where economic controls such as compensation and sanction become dominant motivators (Pfeffer 1994; Tenbrunsel and Messick 1999). The subordinate in my setting will stop thinking about the relationship with the manager and will instead focus on the traditional agency theory incentives of risk and reward. If this is the case, the economic preference to shirk and minimize effort for a given level of compensation will assert itself and a lower level of effort will be observed, *ceteris paribus*.

I argue that if the high LMX subordinate perceives the decision to require a subcertification as a strong signal of a lack of trust, and the social relationship is de-emphasized, LMX quality will be significantly damaged. Assuming the direct effect of LMX quality on effort and justification is observed, this decrease in LMX quality is expected to lead to decreases in effort and justification as well.

Given the above rationale, on average, I expect there to be a lower LMX quality reported by high LMX subordinates who are asked to subcertify, relative to those who are not. Further, on average, I expect effort and justification provided by these subordinates to be less than those high quality LMX subordinates who are not asked to subcertify. Finally, to capture the dependence upon the relative strength of the signal, I hypothesize

that there is an inverse relationship between the perceived strength of the signal in the decision to implement subcertification.

H7: Subordinates in a **high quality** LMX who are required to provide subcertification will report LMX quality lower than those who are not required to sign and are not informed of the decision.

H8: Subordinates in a **high quality** LMX who are required to provide subcertification will exert less **effort** and provide less **justification** than those who are not required to subcertify and are not informed of the decision.

H9: For subordinates in a **high quality** LMX, subordinate perception of the signal strength of requiring subcertification is inversely related to reported LMX quality.

III. METHODOLOGY

I experimentally test the developed hypotheses using a nested two-by-three design. I manipulate LMX quality at two levels (low and high) and the presence of a subcertification requirement at two levels (no subcertification and subcertification). Within the ‘no subcertification’ condition, I manipulate whether the subordinate is informed of the choice to forego subcertification. Primary dependent variables are measures of effort and justification. I administer the materials via computer using MediaLab software. This software controls the order of the delivery of text, documents and HTML files, and tracks the time spent by participants on each item. The materials used in my most recent pilot session are presented in the Appendix. Each item listed is shown to the participant fully formatted, in a fashion similar to a PowerPoint presentation.

When a participant arrives at the computer lab to complete the experiment, it is simply a matter of double-clicking the appropriate file to start the exercise. A welcome

screen thanks the participant for being a part of the study and provides brief instructions. The participant is informed that they have been assigned to pairs with one individual serving as a manager, the other as a subordinate.

The participant is then informed that they have been assigned to the subordinate role and that the task is to generate an estimate to use in determining bad debt expense for the period. Further, the manager desires an accurate estimate. I set the expectation at this point that estimate and justification provided by the participant during this session will be collected in the evening and passed to the manager, who is participating the next day.

The next slide contains the manipulation of LMX quality, which is accomplished in two steps. First, I manipulate the perception of in-group versus out-group by stating that the manager is either from the same class as the participant or from outside the class. Second, I state that the manager has answered a set of survey questions about the manager's management philosophy. The responses to that survey reveal the manager to be either relatively collaborative or authoritarian. In the low LMX condition, the manager is from outside of the class and authoritarian. In the high LMX condition, the manager is from inside the class and collaborative.

The LMX construct is complex and made up of several dimensions that are considered additive. As such, to achieve a strong manipulation of LMX in a lab setting, it is beneficial to develop a manipulation approach that acts on the entire LMX construct, rather than a single dimension. In an early pilot test, a simple in-group versus out-group manipulation yielded significant differences on just one dimension. Adding the survey background of the manager successfully manipulates the other two relevant dimensions, yielded a very strong manipulation of overall LMX. I also argue that this background

knowledge of the philosophy of the manager is predictive of the type of LMX relationship that would develop, should a participant work with that manager over a period of time. For instance, if a high quality LMX is based on a sense of team and reciprocal influence, an authoritarian manager is not likely to cultivate many high quality LMX relationships. As such, this manipulation is a reasonable proxy for LMX quality that develops over time and allows valid inferences about the effects of and on LMX.

In the conditions where subcertification is an option, the next slide displays a description of what subcertification entails and shares that after taking the survey, the manager was offered the option of requiring that the participant to certify the estimate generated. This certification is a statement attesting to the fact that no fraud is present and that the subordinate can knowledgeably certify the accuracy of the estimate. In the subcertification setting, the manager chose to require a subcertification. In the condition where the subordinate is informed of the option to implement subcertification but it is not implemented, the manager chose no.

All participants are next provided with three pieces of information; a chart showing historical bad debt percentages; a memo from finance; a memo from marketing. This data is provided in a random order and paints a mixed picture with no clear solution. Marketing suggests the estimate should be high. Finance suggests it should be low. The chart has an overall upward trend, a recent downward trend and an average that falls in between. There is no compelling reason to generate any particular estimate; however any estimate could be rationalized to some degree.

I next offer the participants the opportunity to conduct research on individual accounts. In my most recent pilot, this comes in the form of hyperlinks to 32 customers

containing the amount owed, the probability of collection and the expected collection amount (equal to amount owed multiplied by probability). If a participant investigates all 32 customer accounts, they have perfect knowledge in the form of the expected value of all receivables. I have since made the task more difficult by removing the expected collection amount and forcing them to choose a sample size representing some percentage of total receivable accounts. The number of accounts considered and the total time spent on the task represent measures of effort and serve as dependent variables.

After conducting research, the participant submits the percentage estimate and subcertification if necessary. Finally, the participant provides any rationale deemed necessary. The word count in this statement serves as my measure of justification.

I next measure LMX quality using the instrument developed in Liden and Maslyn (1998), known as the LMX multidimensional measure (LMX-MDM). The authors identify four dimensions to LMX; Affect, Loyalty, Contribution and Professional Respect (Liden and Maslyn 1998).³ Each dimension is measured using three related questions that are answered on a 7-point scale anchored by Strongly Disagree and Strongly Agree.

Following the administration of the LMX-MDM instrument and several other questions capturing subordinate perception of the manager, demographic information is collected. Finally, a debrief statement is provided and the participants are dismissed.

IV. PILOT RESULTS

I have partially pilot tested the experimental materials using graduate business students. I find significant differences on all measures of subordinate perception of

³ For this study the Professional Respect questions are excluded as they do not make sense in the context of the experiment and are not expected to be affected by the manipulations applied.

manager-subordinate relationship, indicating that my LMX manipulation is effective. I do not predict a difference in the Contribution dimension, expecting that all participants will indicate a willingness to work hard; however, the difference is weakly significant ($p = .10$). It is very interesting that participants in the low LMX condition *explicitly state* via their questionnaire responses that they are not as willing to work for their manager. This certainly suggests that my predictions regarding the direct effect of LMX on subordinate effort will be correct when the full experiment is completed.

I also ask participants about their desire to work with the same manager in the future. These two questions attempt to capture the potential larger costs of low LMX in the form of lower commitment to a manager and increased turnover. Participant responses are significantly different on both questions ($p = 0.038$ and $p = 0.017$), suggesting greater organizational cost when LMX quality is low.

I find significantly different estimates are generated by low and high quality LMX subordinates. Low quality LMX subordinates estimate 6.76 percent and the high quality LMX subordinates estimate 9.08 percent ($p = 0.028$). In the experimental design used in this pilot, it was possible for the participants to acquire 'perfect knowledge' if they researched all the available data. The perfect knowledge estimate is 8.4 percent, so high quality LMX subordinates produced estimates much closer to the most likely value.

Despite the difference in estimates generated, the number of companies researched was not significantly different ($p = .24$). I believe this is due to an artificial ceiling resulting from my experimental design as nearly half of all participants in both conditions examined all 32 customer accounts. As a result, I cannot determine how much research would have been conducted had there been greater information to consider. If I

consider only those participants who did not examine all 32 customers, the low LMX participants examined an average of 8.2 customers and the high LMX participants examined an average of 17.4 ($p = 0.058$). While this is a very small sample, it is suggestive that LMX quality has a direct effect on subordinate effort in the financial reporting process, supporting hypothesis H2a). The design has since been adjusted to make the estimation task more difficult and to eliminate the possibility of perfect knowledge. I expect this will provide a more complete measure of effort under the two LMX levels.

I do not find a difference in the amount of justification provided by high and low LMX participants ($p = .46$). The artificial ceiling also works against my finding results for the justification-related predictions, as it is much easier to explain that all information was considered than it is to rationalize an estimate generated with partial information. I anticipate my changes to the experimental design will yield the hypothesized results in subsequent sessions.

V. DISCUSSION AND CONCLUSION

Thus far, this study offers preliminary evidence consistent with manager-subordinate relationship quality directly affecting the effort exerted by the subordinate in generating an accounting estimate. This suggests that the nature of the relationship between manager and subordinate acts as a control of employee shirking behavior. Further, to the extent that greater effort leads to superior inputs into the financial statements, this also suggests that relationship quality affects financial statement quality. In subsequent experimental sessions using finalized materials, I expect to fully document

this effect. The upcoming sessions will also document the effects of subcertification on manager-subordinate relationships and employee effort in generating an accounting estimate.

This study contributes to the developing accounting literature examining the effect of organizational variables on employee behavior (see Rowe 2004; Towry 2003). I extend this literature by examining control in a vertical (i.e. hierarchical) setting and documenting how the quality of the relationship between a manager and subordinate directly affects subordinate effort and justification in the financial reporting process. I accomplish this by introducing the leader-member exchange construct and LMX-MDM instrument. I also document how adoption of an explicit accounting control, subcertification, can have different effects on subordinate effort and justification depending upon the existing relationship quality. Finally, I consider how imposition of subcertification affects the relationships in an organization and the behavioral consequences, answering the call of Geiger and Taylor (2003) to explore the “effects of CEOs requiring subordinate certification of financial results on psychological factors”.

Managers in practice are concerned about the costs of implementing subcertification, particularly the impact organizational variables such as morale and manager-subordinate relationships. With this study I experimentally examine the impact of subcertification on a measure of manager-subordinate relationship, LMX quality, and the resulting impact on subordinate behavior. I document settings where adoption yields behavioral improvements, as well as settings where *not* adopting will yield similar results. Finally, the findings presented here can be generalized to controls other than subcertification with equivalent predictions. As a result, this study is of interest to

managerial accountants charged with control system design and implementation decisions.

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TABLE 1
Pilot - LMX Quality Manipulation Effects

	LMX Quality Condition ^a		p-Value
	Low (manager outside of 505 and 'authoritarian')	High (manager in 505 and 'collaborative')	
n	11	10	
Percentage Estimate	6.76	9.08	0.028
Manipulation Measures			
LMX Dimensions			
Affect	10.36	14.40	0.003
Loyalty	11.00	15.10	0.005
Contribution	14.27	16.70	0.100
LMX - Compiled	35.64	46.20	0.004
Subordinate trusts Manager	3.82	5.20	0.012
Manager trusts Subordinate	3.82	5.50	0.016
Manager and Subordinate are a team	4.18	5.40	0.045
Work with manager a long time	4.09	5.30	0.038
Same manager next period	3.55	5.00	0.017
Dependent Variables			
Measures of Effort			
Customers Investigated	21.09	24.70	0.244
Time on Customers (seconds)	233.36	261.10	0.367
Justification			
Word count	45.18	43.40	0.462

^a LMX manipulation consists of two components. In the High condition, the participant is informed that the manager is a) from the same class and b) relatively collaborative. In the Low condition, the participant is informed that the manager is a) from another program and b) relatively authoritarian.

FIGURE 1
Theoretical Model

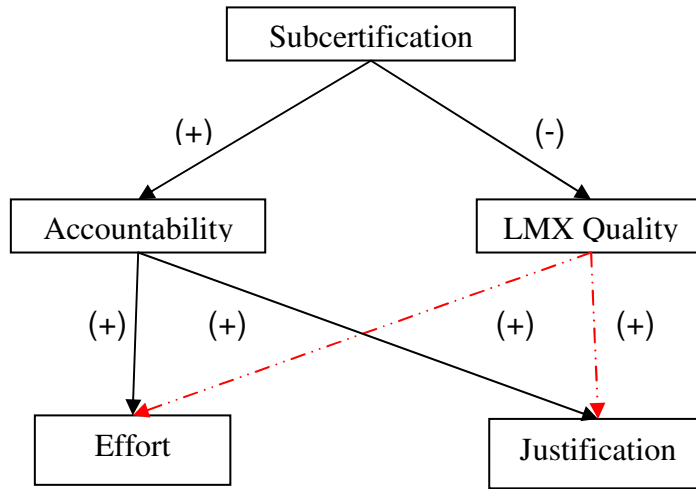
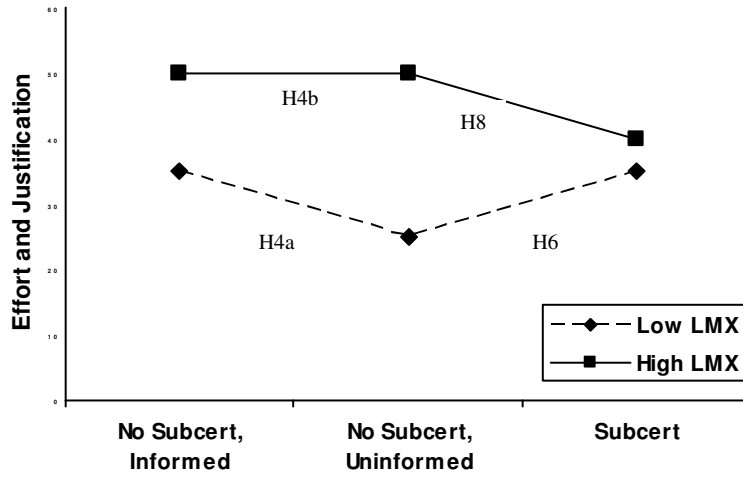
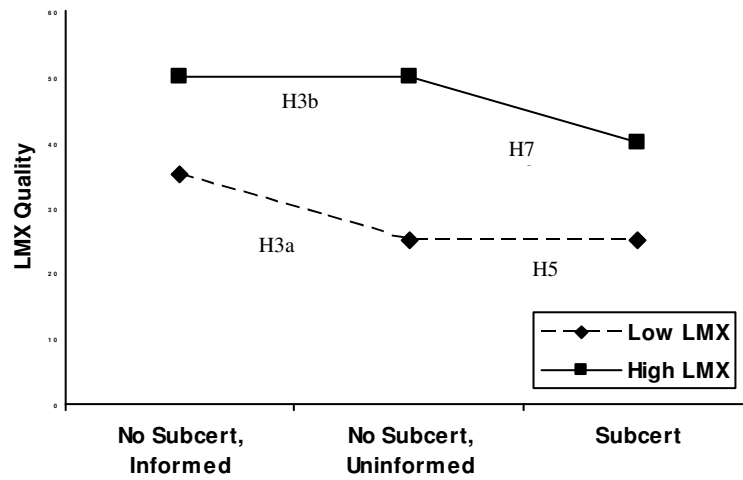


FIGURE 2
Hypothesized Effects

Panel A: Subordinate Effort and Justification across Subcertification Conditions



Panel B: Subordinate Reported LMX Quality across Certification Conditions



Appendix Experimental Materials

The following is a listing of the information delivered via computer by MediaLab.

Item Order	Text and/or Material Delivered
1	<p>Thank you very much for participating in this study. Participation is completely voluntary and you are free to stop at any time.</p> <p>Please read all instructions carefully.</p> <p>You will be paid a flat 'salary' of \$5.00 for your time and effort during this session. I ask that you take the tasks seriously and provide honest and thoughtful responses.</p> <p>In many instances, you will not have the opportunity to back up once you have moved forward. As a result, it is recommended that you take notes as you progress. Please return any notes you make (with your ID noted) to the envelope I have placed near the lectern in your classroom.</p> <p>Your responses are completely confidential and cannot be traced back to you personally.</p>
2	<p>Role: All participants have been randomly assigned to pairs. One individual in each pair plays the role of 'manager', and the other is a 'subordinate' who reports to that manager.</p> <p>You have been assigned the role of 'subordinate'.</p>
3	<p>The task: Your task is to submit to your manager an estimate of the percentage to use in adjusting the Allowance for Doubtful Accounts and in determining bad debt expense. Your manager will use this number to complete the financial statements for your firm and desires an accurate estimate from you.</p> <p>After generating your estimate, you will have the option of explaining the estimate to your manager. This explanation and the estimate itself will be the only information about your actions provided to your manager.</p> <p>Your responses will be collected this evening and passed to your manager for use tomorrow.</p>

4A <The following is delivered in the 'low LMX' condition>

Manager: Participants have been recruited from several departments and programs.

Your manager is a student drawn from outside of your ACC 505 class who has agreed to participate tomorrow.

To maintain anonymity but allow you to know something about your manager, all managers were asked about their management philosophy. Your manager's responses were consistent with a management style characterized by the following:

- 1) The role of a manager is to direct, motivate, control, and modify subordinate behavior to fit the needs of the organization.
- 2) Without management intervention, people will be passive or resistant to organization needs and do not like responsibility. In general, people do not like to work. Managers therefore must reward or punish subordinates to achieve organizational goals.

4B <The following is delivered in the high LMX condition. Same as 4A. Except 1) and 2) are changed to the following>

- 1) People will be self-directed to meet their work objectives if they are committed to them. People will be committed to their objectives if rewards are in place that address higher needs such as self-fulfillment.
- 2) People in general like to work. Therefore, close supervision and the threat of punishment are not the only or best means for motivating employees to work to achieve organization goals. Rather, collaboration and employee involvement is often more effective.

5 You will next receive a brief review of accounting for doubtful accounts.

6 < See Attachment 1> Review of Accounting for Doubtful Accounts.

7 To be sure you understand the implications of your estimate, a higher percentage estimate makes net income: a) lower b) higher c) no effect

8 To help you generate the estimate, you have the opportunity to consider the available data.

9 <The following is delivered via HTML. The last three lines are links and their order is randomly determined>

Data: Bad debt expense is a function of 1) how credit is granted to a customer (i.e. the credit policy) and 2) collection practices, so you have collected memos from the marketing and collections departments. In addition, you have constructed a chart showing the actual percentage of credit sales that have not been collected for the last eight periods. You can now review these three items.

NOTE: DO NOT click 'Continue' until you are done reviewing these three items. Use the green arrow to come back to this page.

Memo from Collections <see Attachment 2>

Historical Chart <see Attachment 3>

Memo from Marketing <see Attachment 4>

10 You now have the opportunity to research individual customer accounts.

Would you like to conduct research? If you select 'No', the next step will be submitting your percentage estimate.

11 <The following is delivered as an HTML file>

The following is a complete list of all the credit sales for your firm for this period, sorted by the amount owed (i.e. Victrex owes the largest balance and F & W Inc. owes the least).

The total of all credit sales is \$3,300,000.

For each customer, you will find 1) the amount owed 2) an estimated likelihood that the amount will be collected and 3) the expected collection amount, which is the amount owed multiplied by the probability of collection.

NOTE: Again, use the green arrow button in the upper left hand corner to come back to this list. Click 'Continue' when you are done researching customer accounts.

<A list of hyperlinks to 32 customers is placed here. Customer info contains 1) customer name, 2) amount owed, 3) probability of collection and 4) expected collection amount, which equals balance times probability>

- 12 After the above items are delivered, the participant provides the percentage estimate and then is offered the opportunity to provide justification for the estimate.
- 13 The LMX instrument and supplemental questions are administered.
<see Attachment 5>

Attachment 1

A BRIEF REVIEW OF ACCOUNTING FOR DOUBTFUL ACCOUNTS

Because there is uncertainty about whether sales on account will be collected, it is necessary to estimate an amount that will not be collected and record an allowance. The transaction entered is of the following form:

Uncollectible Account (Bad Debt) Expense	\$XX
Allowance for Doubtful Accounts	\$XX

Your firm bases the expense and allowance dollar amount on credit sales for the period. For instance, if credit sales for the period total \$100,000 and it is estimated that 10% will not be collected, the following transaction would be entered:

Uncollectible Account (Bad Debt) Expense	\$10,000
Allowance for Doubtful Accounts	\$10,000

The percentage used directly affects expense for the period. As a result, the estimate directly affects reported performance for the period (i.e. a higher percentage estimate leads to higher reported expense and lower net income). Similarly, net assets are decreased with a greater allowance account balance.

Attachment 2

MEMO FROM FINANCE

Date:

To:

From: Department of Finance, Collections

Subject: Collection Practices

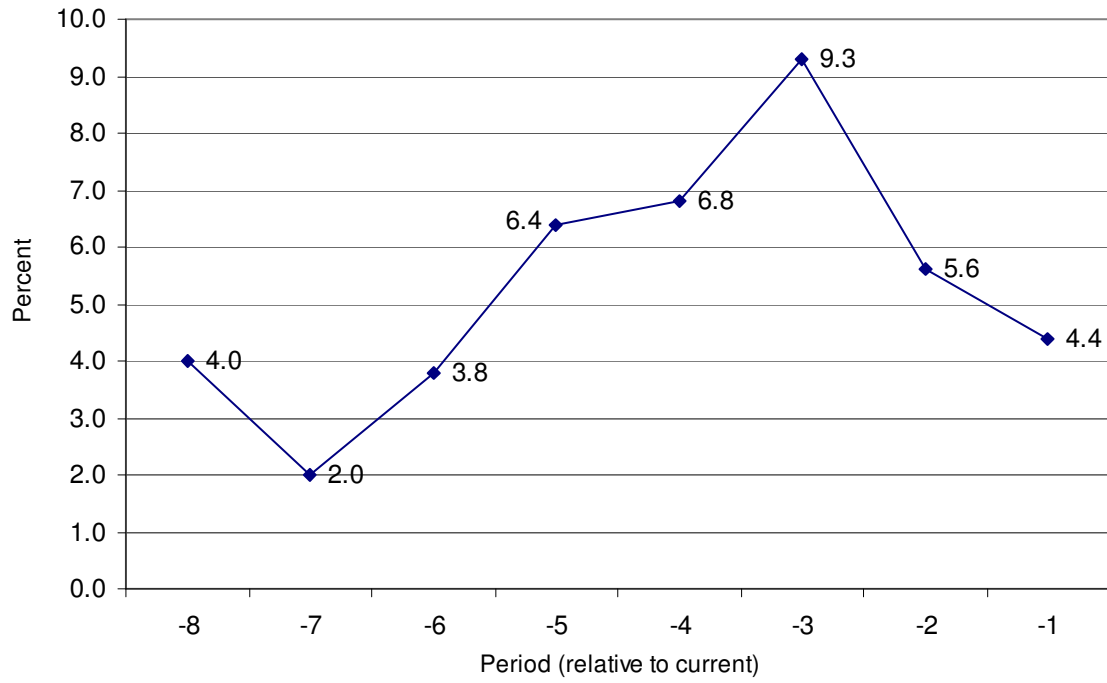
One of the corporate initiatives for the collections department in the current period has been an increased emphasis on collecting accounts that appear to be moving toward uncollectible status.

To accomplish this goal, we have developed internal information technology systems to identify accounts that should be contacted in a more timely fashion. In addition, we have added individuals to our department to ensure that we can contact the identified accounts.

We expect these steps will serve to decrease the credit sales dollars that are not collected from this period, relative to prior periods.

Attachment 3

UNCOLLECTIBLE PERCENTAGE OF CREDIT SALES BY PERIOD



Attachment 4

MEMO FROM MARKETING

Date:

To:

From: Marketing Department

Subject: Credit Terms

As you know, a major corporate initiative this period has been to generate increased sales and improve market share. To support this endeavor, marketing was asked to review the credit terms extended to our customers.

The review was completed and the decision was made to 'loosen' the requirements for receiving credit beginning with the current period. While no new specific guidelines were adopted and it is not possible to determine the exact impact, some customers who would not have been approved before this period were granted credit.

As a result of the above actions, we expect the uncollectible credit sales dollars from this period will be greater than those in prior periods.

Attachment 5

LMX - MDM

All questions are answered on a 7-point scale, anchored by 'Strongly Disagree' and 'Strongly Agree'. The first three categories represent formal LMX dimensions. The final two are additional questions regarding perceptions of the manager and willingness to continue working with the same manager.

Affect

1. My supervisor would be a lot of fun to work with.
2. I like my supervisor as a person.
3. My supervisor is the kind of person I would like to have as a friend.

Loyalty

1. My supervisor would come to my defense if I were 'attacked' by others.
2. My supervisor would defend me to others in the organization if I made an honest mistake.
3. My supervisor would defend my work actions to a superior, even without complete knowledge of the issue in question.

Contribution

1. I do not mind working my hardest for my supervisor.
2. I am willing to do work for my supervisor that goes beyond what is specified as my task.
3. I am willing to apply extra efforts, beyond those normally required, to meet my supervisor's work goals.

Other

1. My supervisor trusts me.
2. My supervisor and I are a team.
3. I trust my supervisor.

Turnover intent

1. I would like to work with the same supervisor in the next round.
2. I could see myself working with my supervisor for a long time.