Abstract

Since the origin of the IT executive role in organizations, IS researchers have attempted to understand the barriers that Chief Information Officers (CIOs) face in their efforts to realize IT business value. One such challenge is the apparent disconnect between the growing importance of information technology to the success of organizations and the relegation of CIOs to tactical rather than strategic roles in their organizations, thereby hindering the transformative power of IT as a competitive advantage. This dissertation tackles this disconnect suggesting that CIOs are caught up within a widely-shared and entrenched stereotype of IT professionals that views them as lacking leadership competencies. Specifically, this dissertation puts forward the claim that CIOs may face a glass ceiling (similar to minority groups) and that stereotypical beliefs limit (if not deny) them the opportunity to drive the organization forward in the use of IT.

Four studies examined the content of these beliefs held by perceivers outside the IT profession and identified the contexts within which these beliefs can cause biased decision-making concerning the role of CIOs. Taken as a whole, this dissertation empirically tests the long-held anecdotal assumption of a CIO stereotype and identifies biases that can cause inequality perceptions at strategic levels of the organization; specifically, the perception of CIOs as "the last among equals" or as unequal members of the C-suite appears to limit their strategic involvement in corporate decision-making. This research contributes to the study of IT leadership and advances our understanding of the persistent 'perception gap' that has intrigued (and plagued) IS researchers and practitioners for a long time.
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List of Abbreviations

The following table describes the significance of various abbreviations and acronyms used throughout the thesis. The page on which each one is defined or first used is also given.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>C-suite</td>
<td>(Or “C-level”) represents the most senior executive team within an organization.</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>CFO</td>
<td>Chief Financial Officer</td>
</tr>
<tr>
<td>CIO</td>
<td>Chief Information Officer</td>
</tr>
<tr>
<td>CMO</td>
<td>Chief Marketing Officer</td>
</tr>
<tr>
<td>CxO</td>
<td>Any C-level executive</td>
</tr>
<tr>
<td>IS</td>
<td>Information Systems</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
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Chapter 1

Introduction

“As soon as a CIO walks into a room, the audience forms an immediate impression of what he or she can and cannot do … one aspect of the stereotype highlighted by the CIOs was that they are not considered to be business players” (Peppard 2010, p.18)

“I’m sitting in this meeting with other C-members,” he [the CIO] said. “I’m supposed to be involved in strategy but the CEO turns to me and asks if I could fix his iPhone. He actually thought that was my role.” (Morantz 2014)

1.1 Research Questions and Approach

Much has been written by IS researchers and practitioners about the challenges faced by the senior IT executive (i.e., CIOs1) and the role of the IT2 function in organizations (e.g., Banker et al. 2011; Chen et al. 2010; Peppard 2010, 2011; Tallon 2014). One such challenge is the apparent disconnect between the criticality of information technology for organizations’ strategic positioning (e.g., differentiation or cost leadership) (Banker et al. 2011) and the lack of CIO involvement in this positioning (Peppard 2010; Preston et al. 2008). Although it has been suggested that not all organizations need to include IT as an essential part of their business strategy (Preston et al. 2008), numerous studies have demonstrated that the strategic authority of the CIO influences the value that organizations receive from IT. For example, CIO strategic involvement (e.g., structural power, managerial discretion, credibility) has been found to be

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1 The CIO (Chief Information Officer) is the title frequently given to the most senior executive (or manager or director) responsible for the IT function in an organization. The CIO oversees the IT function and is responsible for managing the organization’s information resources, offering vision for the role of IT in the organization, promoting IT as an agent of business change, redesigning the organization’s strategy, and ultimately creating business value (Banker et al. 2011).

2 IT (information technology) and IS (information systems) are used interchangeably in this document as the CIO who leads the IT function is in charge of both the technology (IT) as well as the systems (IS) within the organization.
positively correlated to financial performance and business innovation (e.g., Banker et al. 2011; Chatterjee et al. 2001; Chun and Mooney 2009; Preston et al. 2008).

Despite the fact that CIOs are increasingly gaining access to the “C-suite”\(^3\), many CIOs struggle with gaining the strategic involvement needed to drive their organizations forward in the use of IT. As illustrated by the two quotations above and other studies (e.g., Peppard 2010, Peppard 2011), the dominant belief is that CIOs are not strategic decision-makers, are viewed as service providers, and are limited primarily to tactical roles. In an earlier study, Hirschheim et al. (2003) found that, despite ample evidence to the contrary, the CIO (and the overall IT function) were considered ineffective and overly costly. This led the CEO to reduce IT resources and restrict the role that IT was allowed to play with a corresponding reduction in IT-enabled value. This phenomenon, often referred as the “perception gap”, is manifest in the mismatch between the expectations and beliefs about the IT function possessed by individuals inside with those outside the IT organization (e.g., Hirschheim et al. 2003; Peppard 2010).

Attempts to explain this phenomenon in terms of IT alignment and strategic business partnerships (e.g., Reich and Benbasat 2000; Tallon et al. 2000) have met with limited success. The fact remains that, after fifty years, the gap still persists. A possible explanation for the persistence of this gap may be the existence of broadly based CIO stereotypes.

The existence of such occupational stereotypes at high levels of the organization is important to understand because people act in accordance with their stereotypes (i.e., profiling) and often their decisions are biased (Kunda and Sherman-Williams 1993; Richards and Hewstone 2001). For example, if people believe that “CIOs are not strategic thinkers”, then they are not

\[^3\] C-suite (or “c-level”) represents the most senior executive decision-making group within an organization. The term was coined because many of the members of the C-suite have titles beginning with the letter “c” (e.g., CEO, CIO, CFO). It is also referred to as the TMT (i.e., top management team).
likely to appoint CIOs to lead new strategic initiatives. According to stereotype theory, the weight of evidence suggests that stereotypes are persistent and difficult to change (Fishman 1956; Schneider 2005).

Despite anecdotal evidence in the practitioner literature (and to a lesser extent in the academic literature) of the existence of stereotypical beliefs, no known research has empirically examined the structure of CIO stereotypes and, more importantly, the potential impact of such stereotypes on the role that CIOs are allowed to play in organizations. Developing a comprehensive measure of stereotypes (e.g., free responses and adjective lists) and using an experimental-survey methodology to examine the causal mechanisms of stereotypes, this dissertation addresses two important questions examined in four studies:

Research question 1 (Chapter 3):
Does a CIO stereotype exist? If so, what is the content of this stereotype?

Research question 2 (Chapter 4):
What are the consequences of this stereotype for the role of the CIO?

The first research question is examined in two studies. A first study investigates the stereotype content of CIOs and contrasts this content with the prototype of general C-level executives and IT professionals. The dissertation argues that perceivers outside the IT profession (i.e., with little or no IT background) hold a broadly-based CIO stereotype and that they view the CIO as more similar to an IT professional than to a C-level executive. This is consistent with anecdotal evidence that suggests that an IT stereotype not only exists (e.g., Garcia-Crespo et al., 2008; Peppard 2010; Pfleging and Zetlin 2006; Willcoxon and Chatham 2006), but also exists at the highest levels of the organization where key decisions are made regarding the role of IT.
Given that stereotypes are assessed relative to well-defined categorizations (e.g., men versus women, Hispanic versus Asian), a second study contrasts CIOs to two other well-known and established professional roles in the C-suite: CFOs (chief financial officers) and CMOs (chief marketing officers). That is, CIOs may be considered “detail-oriented” but, in order to make sense of this, we need to know the comparison group. This study, thus, identifies specific personality and behaviour traits that differentiate CIOs from other C-level executives. The thesis predicts that perceptions related to the IT stereotypical profile will spill over to the assessment of CIOs and thus CIOs will be profiled differently than the other two C-level executives. Specifically, the differences will most likely occur with respect to leadership attributes. Because of the stereotypical traits associated with IT professionals, CIOs will most likely be viewed as less competent in terms of social skills and leadership ability. These two studies are considered the baseline analysis to assess the impact of these stereotypical beliefs on the CIO role. By exploring the content of these stereotypes (i.e., set of beliefs) and the differences when compared to other groups, information can be gained to better understand the causes of potential bias in decision-making. Therefore, following these studies, a second set of two studies investigates how (or if) the stereotypical beliefs potentially impact the role of the CIO (research question 2).

These follow-on studies explore the effects of the stereotypical beliefs on decisions concerning the promotion and performance evaluation of CIOs in comparison to CFOs (study 3) and CMOs (studies 3 and 4). These studies examined the fit between the CIO stereotype and corporate strategic roles. They predict that, due to incongruent stereotypes, CIOs are viewed as ill-equipped senior managers for strategic roles and as deserving more severe punishment than a business counterpart when a failure occurs. Why might this occur? One possibility is the combination of 1) the historical supportive and tactical organizational role assumed by CIOs and
2) the institutional barriers perpetuated by professional stereotypes (or attributions) that distribute the structural power in organizations. For example, dominant professional groups (e.g., finance, marketing) have been traditional business areas and as such tend to be more visible, have more control over persons and organizational resources, thereby giving them more authority, credibility, and perceived expertise as compared to less traditional business areas such as IT.

Due to the enduring nature of stereotypes, the current work also examines the persistence and consistency of these stereotypical beliefs. The first three studies were analyzed in two different sample populations – business students and senior managers (with more than 10 years of professional experience). Based on the theoretical grounding of stereotype theory and the anecdotal evidence of the IT stereotype at higher levels of the organizations (i.e., the first quotation is an example), the thesis predicts that the stereotypical beliefs will most likely remain constant across these samples (i.e., across time).

One of the central thrusts of the current work is the comparison of the “glass ceiling” phenomenon faced by minorities (e.g., women, African Americans) to CIOs who, similar to some minority groups, face challenges when moving up in the management hierarchy. That is, the dissertation puts forward the claim that CIOs also face a glass ceiling rooted in bias and stereotypes that precludes them the opportunity to drive the organization forward in the use of IT. The current work also suggests the existence of a functional background bias that can cause inequality perceptions at strategic levels of the organizations (specifically, the perception of CIOs as unequal members of the C-suite in terms of leadership capabilities) that ultimately can limit CIOs’ potential contributions to corporate decision-making and strategic involvement.
1.2 Intended Contribution

This dissertation, by drawing from the extensive literature on stereotypes and the problems faced by minorities in management due to the existence of these beliefs, enriches our understanding of the challenges faced by CIOs in their endeavours to realize IT value for their organizations. It also contributes more generally to the occupational stereotype literature, both within IS and in the broader human resources literature.

With regard to IS, this work identifies stereotypical beliefs of CIOs as an important basis for CEOs’ and other business executives’ attitudes towards CIOs (and implicitly towards the IT organization). In doing so, it identifies the CIO stereotypes as plausible causal mechanisms that prevent CIOs’ active participation in corporate-decision making and strategic involvement. Therefore, this thesis responds to research calls for understanding the causes and dynamics of perceptions concerning CIOs and IT organizations in order to shape and manage them at the top management level (e.g., Hirschheim et al. 2003; Kaarst-Brown 2008; Peppard 2010; Tallon 2014).

This work examines two fundamental aspects of CIO stereotypes (i.e., content and comparison to other professional groups) and identifies conditions under which these stereotypes are more likely to create biases against the role of CIOs, and ultimately the IT organization. By comparing the content of the stereotypical profiles of CIOs with that of other professional groups (e.g., CFOs and CMOs), it examines the inequality perceptions at the C-suite. The perception of CIOs as unequal C-suite members has been linked to the role that IT plays in the organization (e.g., Peppard 2010; Peppard et al. 2011; Lim et al. 2012); however, to our knowledge no study has empirically tested the potential causality of this assertion. Also, the use and application of different stereotype assessment procedures and the examination of these beliefs across sample
populations with different work experience will shed light on the self-reinforcing aspect of stereotypes, and thus advance our understanding of the persistent ‘perception gap’ (e.g., IT-business gap) that has challenged IS researchers for a long time.

With regard to the behavioural management literature, specifically to the human resource management literature, little research exists on professional stereotypes at the highest level of the organization hierarchy (e.g., members of the C-suite). Furthermore, most of the research has examined bias on the basis of gender, race, and ethnic groups, but little on functional background bias (e.g., Westphal and Milton 2000). Yet, there is a great deal of evidence from related topics (e.g., promoting decisions) suggesting that these executives may also face bias in evaluations of their work performance (Kraiger and Ford 1985). By introducing a new research lens to examine the well-documented situation of CIOs, we hope to advance our understanding of the functional background bias as potential psychological barriers for functional minorities at the highest level of the organization.

The proposed study will also contribute to the practitioner community. By establishing the content, strength, and impacts of the stereotypical beliefs of CIOs, we can better understand this role, and ultimately the functioning of the IT organization. To date, the role of the CIO is fraught with ambiguity (Peppard et al. 2011). Scholars indicate that this ambiguity is rooted in the multiple roles of the CIO found in the industry, which in turn, is determined by the information and technology strategy of the organization as well as the maturity of the information leadership capabilities (Peppard et al. 2011). Stereotypes thrive within situations of ambiguity. Thus, this study will alert practitioners and organizations to the urgent need to reduce this ambiguity so that biasing effects (decisions) caused by stereotypes can be decreased.
The ultimate goal of this research program is to apply our research findings to the actual practice of IS professionals and, in particular, CIOs. Research (Carnegie and Napier 2010, p. 363-364) has shown that where members of a group believe that their group is being stereotyped negatively, they have three options: they can ignore the negative stereotype, leave the group, or work to change the stereotype. The option of leaving the group may be virtually impossible (e.g., ethnic and gender groupings) or considered to be undesirable (e.g., occupational groupings where a considerable amount of effort has been invested in becoming a member). Ignoring the negative stereotype, or even accepting and playing up to it, may be acceptable if significant costs do not flow from this option. But members of a group burdened with a negative stereotype are more likely, if they wish to enhance their social status, to work to change the stereotype (i.e., the third option). CIOs face the same set of alternatives. It is our plan to extend our research to explore the means for CIOs to enhance their organizational status. These contributions and venues for future research will be discussed in more detail in Chapter 5.

In sum, exploring these stereotypes, their antecedents, and their behavioural effects, will enhance our understanding of the role of CIO and the IT organization particularly with respect to the creation of IT-enabled business value.

1.3 Structure of the Thesis

In Chapter 2, the plight of the CIO will be discussed more comprehensively in order to define the central problem that the dissertation addresses. More specifically, by reviewing the IS practitioner and academic literature, this thesis starts by discussing the challenges faced by CIOs in their efforts to realize IT value for their organizations. This Chapter also discusses the reasoning behind the study of stereotypes in the context of CIOs and the similarities with other stereotyped groups in organizations. Next, Chapters 3 and 4 describe the four studies that
collectively address the two main research questions of this work as previously mentioned. Each of these Chapters discusses the rationale behind the studies, presents the theoretical background supporting the predictions and reviews the relevant literature, outlines the method and results with respect to testing the hypotheses and addresses more specific research questions deriving from them, and ultimately discusses the results. Finally, Chapter 5 discusses the theoretical and managerial implications and highlights the dissertation’s contributions, limitations and avenues for future research.
Chapter 2

Problem Definition - The Plight of the CIO

Once a senior manager reaches the C-suite, technical and functional expertise become less important than his or her credibility as a business leader (Groysberg et al. 2011). It is this credibility that plays a major role in determining the C-suite member’s freedom and ability to take actions on strategic decisions concerning his or her role and to influence successful performance outcomes for the organization as a whole (Kaarst-Brown 2008). Unfortunately, after thirty years of existence, CIOs continue to struggle (arguably more than most of their executive peers) to establish this credibility. When questioned about what they found when they walked into their most recent job, CIOs’ most common answer was “IT [and therefore their role] had no credibility with the business” (Heller 2013, p. 180).

Although there is little debate regarding whether or not IT has become essential to the strategic operation of most organizations, this in itself seems to be paradoxically the case for the CIO (Kaarst-Brown, 2008). On one hand, IT is so embedded in business today that it has become critical for competitive performance. Because of this, IT is now a top priority for members of the Board of Directors and overseeing strategic planning and game-changing advances in IT is a hot topic for U.S. public companies (Noked 2013). But, on the other hand, less than 10% of CIOs have been assigned board duties (IBM 2009) and only 20% of CIOs are viewed as business strategists (CIO Magazine 2013). “It's heartening that 20 percent of CIOs say their IT groups are seen as business peers who develop, not just enable, business strategy” (Nash 2013, p.1); but, while these 20% of CIOs are acting as key strategic partners to the organization and taking a much broader role in driving business transformation, the remaining 80% continue to struggle in
this endeavour. Although the CIO may hold a C-level position, the reality is that this executive is more often seen as a service provider than as a strategic player with commensurate credibility (EY 2014; Gerth and Peppard 2013; Kaarst-Brown 2008).

The question that can be asked is the following: Is it beneficial (or even necessary) for CIOs to assume a strategic role within their organizations? That is, is it the plight of the CIO or is it also the plight of the organization? Research evidence suggests that it is indeed the plight of the organization because it is through strategic leadership that CIOs can most significantly influence the impact of IT on organizational performance (Preston et al. 2008). Studies (please refer to Appendix C for a review of these) have shown that CIOs who have the authority to engage in strategic decision making can help to set and direct business goals on what IT can do to expand firm performance (Armstrong and Sambamurthy 1999; Kearns and Lederer 2003) and to influence the organization’s strategic position (e.g., differentiators or cost leaders) (Banker et al. 2011). On the other hand, CIOs who are not given this opportunity to exert a strategic role are likely to have a lower level of influence, or possibly even unfavourable influence, on the contribution that IT makes to organizational performance (Preston et al. 2008).

The credibility of the CIO is also felt to suffer due to the general lack of understanding of the nature of what CIOs actually do. Research has shown that the role of the CIO is not only misunderstood but, in fact, riddled with ambiguity (Peppard et al. 2011). Attempts to describe the role of the CIO over the last 30 years have failed to produce an unambiguous description. Furthermore, the research has proved equivocal where one group portrays CIOs as innovators, facilitators, change leaders, influential leaders, relationship builders, and enablers (Banker et al. 2011) while another group portrays CIOs as product developers, technology provocateurs, supporters, cost cutters, project managers, and utility IT directors, (Gottschalk 2002; Peppard et
A potential explanation for this ambiguity derives from a bipolar belief by CEOs and CxOs about the IT organization (Peppard et al. 2011; Peppard, 2010). At one end of the continuum is the belief that IT is a cost center; at the other end is the belief that IT offers significant strategic opportunities. In the absence of a shared understanding of the CIO role, it is easy to understand how and why the credibility of the CIO can suffer.

CIOs’ credibility also suffers from association with past disappointments with IT investments and, as a result, CIOs experience shorter tenure than other C-level executives (Bonfante 2014; Peppard et al. 2011; Rothfeder and Driscoll 1990). In comparison with other business initiatives, IT projects are continually dogged by high failure rates leaving executives to question the return from IT investments (Peppard 2010; The Standish Group 2013). With IT enabling virtually all organizational initiatives, the tendency is to blame the CIO regardless of the decisions that are made by other business executives (Louchart 2012). The following quotations illustrate this:

“CIOs are damned if they cause problems by changing too quickly (upgrading hardware or software to get alleged new function), because they cause instability. There are damned if they don’t change quickly, because a technological advance – say, a good e-commerce solution can make a business.” (Heresniak 1999, p. 52)

“There are always a lot of headwinds for CIOs to try to get through. CIOs can do outstanding work yet still catch the blame when business models sour, strategy shifts or top management changes." (Johnson 2012, p.1)

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4 The term “CxO” refers to any member of the “C-suite”.
5 The 2012 CHAOS results reveal that 71% of IT projects are challenged (i.e., late, over budget, and/or with fewer than the required features and functions) and failed (i.e., cancelled prior to completion or delivered and never used). The statistics for large IT projects are more depressing, only 6% are successful (The Standish Group 2013)
Much of the CIO credibility problem derives from the dominant belief that CIOs lack the necessary managerial competencies and overall business knowledge to drive their organizations forward in the use of IT (Karahanna and Watson 2006; Peppard 2010). Traditionally CIOs are portrayed as “not being strategic in their orientation and having little credibility with their business colleagues” (Peppard 2010, p.2). To examine this, researchers have explored the personal competencies, personal attributes, and characteristics of successful CIOs (e.g., Chen et al. 2010; Li and Tan 2013; Li et al. 2006) The upshot of this research has been to encourage CIOs to take a more proactive leadership role in their organizations and/or to admonish them for not having already done so (Enns et al. 2003, 2006; Mark and Monnoyer 2004; Peppard 2010). This literature further advises CIOs to become business experts as opposed to technical experts, acquire business degrees if those are lacking (e.g., MBAs), become effective communicators, and to learn to deal with the power issues resulting from organization politics (Dawson and Watson 2011; Lepore et al. 2000).

As valuable as this advice may be, possessing such leadership competencies is only one side of the equation (Peppard et al. 2011). “The assumption seems to be: get the ‘right’ person in the position with experience and the appropriate blend of skills and competencies and any problems with IT will be solved” (Peppard 2010, p. 2). But, “aren’t these competencies generic and required by all senior executives?” (Peppard et al. 2011, p. 33). Research (e.g., Appelbaum 2000; Lepak et al. 2006) has shown that having the ability (i.e., the skills and aptitudes) to perform a task is but one of three critical requirements; the other two are motivation and opportunity. Research that examines the skill set of CIOs ignores these other key factors. The point is that, regardless of whether or not CIOs possess adequate leadership skills, they may be being denied opportunities for strategic initiative leadership, which precludes the opportunity to
develop and/or display leadership acumen – a mechanism that reinforces the CIO credibility shortfall.

It is interesting to note that women and minorities have been affected by similar belief structures. For decades, women were assumed to lack certain managerial skills and competencies (e.g., women cannot work long hours, women cannot fire people, women are not decisive, women are too emotional and not rational) and because of the general and widespread acceptance of these perceptions and beliefs, women were denied opportunities to assume leadership positions (Morrison et al. 1992; Powell and Butterfield 1997). This denial of opportunities by senior managers reinforced the general belief about women and resulted in a self-fulfilling prophecy where women were actually confirming those beliefs. The research breakthrough occurred when researchers switched their focus from the specific traits and competencies of women (or lack thereof) and began to examine the barriers facing women in organizational settings. This research, now commonly known as the “glass ceiling” effect, yielded a much more productive and insightful explanation for the slow progression of women and minorities into higher and strategic positions.

Significant but mostly anecdotal evidence lends support to the existence of stereotypes of CIOs. The common belief is that CIOs lack necessary leadership skills, are not strategic in their orientations, are too technical and only interested in technical matters, and are simply not business players (García-Crespo et al. 2008; Peppard 2010; Pfleging and Zetlin 2006; Stewart 2002; Willcoxon and Chatham 2006). The extent that such beliefs are apparently widely shared among senior managers entraps CIOs in a self-fulfilling prophecy. That is, denying them strategic

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6 The glass ceiling is defined as a “barrier so subtle that it is transparent, yet so strong that it prevents women and minorities from moving up in the management hierarchy” (Chung-Herrera and Lankau 2005, p. 2029).
opportunities reinforces their lack of credibility as business players and critical business partners within the organization. Therefore, similar to women and other minorities in organizations, CIOs may face a glass ceiling rooted in bias and stereotypes that precludes them the opportunity to drive the organization forward in the use of IT.

The next two Chapters present the conceptual development (e.g., hypotheses and more specific research questions) and studies designed to examine the general purpose of this research study.
Chapter 3

The CIO Stereotype and the “Glass Ceiling” Effect

3.1 Introduction

One of the unanswered yet intriguing questions is whether the CIO is perceived as an equal member of the C-suite (i.e., sharing similar management characteristics with other C-level executives) or is the CIO considered an outsider (or minority) representing the technical functioning of the business. The CIO title was coined more than thirty years ago as an executive who initially was expected to help the organization create value from its investments in technology, but this role was subsequently enhanced to provide business transformation and to act as a strategic partner to the CEO and wider organization (IBM 2008). However, CIOs have generally struggled to fulfill the enhanced role due to the existence of barriers that prevent them from becoming strategic partners to the organization. One potential barrier is overcoming the dominant belief that CIOs lack the specific management characteristics (i.e., leadership traits) that would make them competent in strategic roles (Peppard 2010). But, where does this belief come from? In this study, I propose that this belief is rooted in aspects of a general IT stereotype that spills over onto CIOs’ image, thereby creating an IT-business gap and hindering the perception of CIOs as C-level executives. For this reason, I compare perceptions of stereotypes of CIOs against general perceptions of an IT professional and a C-level executive.

The anecdotal evidence referring to the existence of an IT stereotype (e.g., Garcia-Crespo et al., 2008; Peppard 2010; Pfleging and Zetlin 2006; Willcoxon and Chatham 2006) suggests that, not only does an IT stereotype exist, but that it exists at the highest levels of the organization where key decisions are made regarding the role of IT. The existence of such an occupational
stereotype is important to understand because research has repeatedly shown that “people form impressions and behave in accordance with their stereotypes” (i.e., profiling). For example, if the perception\(^7\) is that “CIOs are not perceived as business leaders”, then CIOs are not likely to be given the discretion to act as business leaders (e.g., appointed to lead strategic tasks, career advancement). In so doing, these perceptions can potentially create a glass ceiling effect that denies CIOs the opportunity to drive the organization forward in the use of IT.

CIO participation, contribution and involvement in senior management decision-making may depend on the role of perception at this C-suite level. Although we recognize that the actual contribution of CIOs is a function of their unique abilities and skills as senior business leaders, research and anecdotal evidence shows that their contribution and involvement greatly depends on the opportunities that are made available to them (Peppard 2010). And this is a matter of equality perceptions.

Previous research on stereotypes in organizations looked at the equality of perceptions that characterize women and men in managerial roles and compared them to the successful-manager prototype (e.g., Dodge et al. 1995; Heilman et al. 1989). These studies found that men in general are described as being more similar to successful managers than are women. Even though the compatibility of attributes between women and successful managers have increased over time, the overall attribute congruence between women and successful managers still significantly lags that of men, making it difficult for women to occupy authority male-dominated positions.

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\(^7\) Perception refers to the different mental processes that we use to form impressions of and make inferences about others. These processes can be very subjective and can be impacted by a number of variables. Factors that can influence the impressions we form of other people include the characteristics of the person we are observing, the context of the situation, and our own personal characteristics (Wyer and Albarracín 2005). One of the mental shortcuts that we use in person perception is known as stereotyping (Bargh et al. 1996).
In analogous fashion, this research examines the equality of perceptions that characterize CIOs in comparison to a general C-level prototypical profile, two specific C-level executive profiles (e.g., CFOs and CMOs) as well as to an IT professional. The purpose is to assess the congruence of specific CIO characteristics with those of other executives. If the CIO participation, contribution, and involvement (i.e., credibility) in senior management decision-making depend on the role of perception at the C-suite level, it is important to know on what characteristics (e.g., traits, behaviours) CIOs are seen as being different from (or similar to) other C-level executives and whether those differences/similarities are influenced by stereotypical beliefs of IT professionals.

Therefore, the present study has three objectives. First, I investigate the stereotype content of CIOs and contrast this content with prototypical beliefs of general C-level executives and IT professionals. These results will help to identify whether or not the CIO stereotypes are indeed rooted in the general IT stereotype as suggested by other researchers and, if so, what aspects of the IT stereotype spill over into the perceptions of CIOs. Similarly, it will identify the characteristics that make CIOs different from (or similar to) C-level executives. A second objective of the study is to compare perceptions of stereotypical profiles of CIOs against stereotypical profiles of CFOs and CMOs – two well-known and established professional roles in the C-suite – in order to discover the specific elements of the CIO stereotypes that differentiate CIOs from other C-level executives. Finally, I explore the persistence and consistency of these

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8 The CFO and CMO groups were chosen for two main reasons: First, stereotypes are often assessed relative to well-defined relevant categorization (e.g., women versus men, whites versus African Americans, Caucasian versus Hispanic). Second, Finance and Marketing are considered relevant comparison groups due to the traditional view of business functional activities that are closely linked to corporate performance. Neoclassical economic principles view finance/accounting as primary activities to look after the firm’s overall wellbeing (Firer and Mitchell Williams 2003) while marketing is considered a primary activity in the classification of Porter’s value chain activities (Porter 1987).
stereotypical profiles across groups with different work experience (i.e., business students and senior managers). Due to the persistent nature of stereotypes in general and empirical and anecdotal evidence of stereotypes at higher levels of the organization, I posit that these stereotypical profiles will most likely remain constant over time.

By exploring the content of these stereotypes (i.e., set of beliefs) and the process by which they can bias decision-making, information can be gained that could help to shatter the glass ceiling mentioned earlier. For example, by better understanding stereotypical profiles of C-level executives, knowledge of different or dominant models of leadership can be garnered. On one hand, identifying a dominant model of leadership would serve to highlight what aspects less dominant groups or minorities need to work on in order to gain that credibility. On the other hand, as different and maybe less dominant models become more salient and understood as “not bad just different,” acceptance and awareness of alternative models would ensue, allowing for an increased flow of minorities into strategic managerial positions.

In the next section, I briefly describe the different theories that have been offered as explanations for the glass ceiling with a focus on the bias and stereotyping theoretical perspective that is of specific relevance to this research. Bias refers to a reaction to people from other groups on the basis of perceived membership in a single social category (e.g., women, blacks, accountants) while ignoring other personal attributes or individuating information (Fiske 2002). Stereotypes, prejudice, and discrimination characterize the cognitive, affective, and behavioural aspects of bias (Fiske, 1998). In organizational settings, bias often occurs in hiring, promotion and performance assessments of subordinates (e.g., Gorman 2005; Igbaria et al. 1996; Ohlott et al. 1994) A number of studies identified the bias and stereotypes held by the majority population
as the cause of delayed progress for minorities (e.g., Finkelstein and Hambrick 1996; Larwood et al. 1984; Morrison et al. 1992).

Hypotheses and exploratory research questions are also presented in this section.

### 3.2 Literature Review and Conceptual Development

#### 3.2.1 Bias theories: Why do minorities face a glass ceiling in organizations?

The glass ceiling is thought to exist due to the strong belief by some in the dominant group that others - usually minorities from a different gender, ethnic and functional background - are less suited (or ill suited) for management positions (Morrison and von Glinow 1990). This belief persists due to institutional barriers, traditional roles, and social psychological processes (Chung-Herrera and Lankau 2005). Institutional barriers refer to corporate policies and practices that in one way or the other exclude people who are different (Fernandez and Davis 1999). As a result, minorities are usually excluded from networks and informal workgroups that could offer them the opportunity to be more visible, exert power, and thus be mentors for others in their group (Corsun and Costen 2001; Davidson and Friedman 1998). Historical or traditional roles are often associated with the dominant and more powerful groups unlike relative newer roles. These differences between groups impact the distribution of power within organizations. Dominant groups (e.g., male, white) usually have more control over persons, information, and organizational resources and this gives them more authority, credibility, and perceived expertise over the less dominant ones (Ragins 1997, p. 487).

These institutional barriers are in fact perpetuated by group stereotypes and attributions based on these traditional roles and, even when minorities break through these barriers to hold authority roles similar to the majority or dominant groups, they may still be perceived as less competent and possessing less power (Fiske 1993; Haslam 2008). In addition, ambiguity or lack
of knowledge about an individual and his/her role contributes to bias against the minority because judgments are usually based on negative stereotypes of the group as a whole (Kunda and Sherman-Williams 1993; Richards and Hewstone 2001). Stereotyping has thus been highlighted as the systematic barrier to explain the structural discrimination of minorities in organizational settings.

3.2.2 Bias and stereotyping theory

3.2.2.1 Stereotypes: Prototypes and schemas

Stereotypes have been defined in several ways (see Hamilton and Sherman 1994). When the term was first introduced, stereotypes were loosely described as “pictures” that we form about people and events encountered in society (Lippmann 1946) or as “an exaggerated belief associated with a social category” (Allport 1979). Current perspectives from social cognition define stereotypes as beliefs about the characteristics, attributes, behaviours and expectations of members of a social group (Hilton and Von Hippel 1996; Kunda 1999). More than beliefs about a social group, stereotypes are also theories about how and why certain attributes go together. The nature and purpose of these theories also play an important role in examining when stereotypes are applied and when they are likely to applied and to change (Oakes and Turner 1990; Wittenbrink et al. 1997).

Generally, the use of stereotypes (i.e., stereotyping) involves three aspects (Hinton 2013, pp. 7 – 8). First, a group of people are distinguished from the masses by reference to a specific characteristic. Typical identifying characteristics are gender, race, ethnicity, occupation, and appearance. Second, additional characteristics are associated with the group. The important feature here is the attribution (i.e., positive and negative) of these additional characteristics to all members of the group. Finally, when identifying a person as belonging to a given group, we also
attribute the stereotypical characteristic or characteristics to that person. In this sense, a stereotype is constructed from the set of characteristics that we automatically associate with members of an identifiable social group.

The perspective of stereotypes as mental representations of social categories highlights two important models that describe how the information about these categories is represented and organized: the “prototype” and “schema”. The “prototype” of a particular class of objects or individuals is the “model” of that object or person that comes to mind as the best representation of the object or individual or the most typical example of that category (Mervis and Rosch 1981). That is, perceivers store abstract representations of a group’s typical characteristics and judge individual group members on the basis of similarity comparison between the individual and the prototype (Cantor and Mischel 1979). For example, when we are asked to think of a ‘manager’, we will bring into mind a prototypical manager. The typicality effect indicates the sort of manager this model or prototype is: it will be closest to the real managers we recognize most quickly. Prototypes are generally determined by looking for family resemblances between category members: the more characteristics an object or individual shares with other category members and the fewer it shares with members of different categories, the more prototypical it is (Hinton 2013).

Prototypes help us decide what type of person someone is. Cantor and Mischel (1979) suggest three factors of this process categorization: how many of the category characteristics does the persona have? (breadth); to what extent do these characteristics stand out from their other characteristics (dominance); and does the person have characteristics incompatible with the category? (differentiation from other categories). For example, Paul is more of a geek (i.e., keen, hardworking student who prefers studying over other activities) than James, even though they
both do well in tests, because Paul is always asking the teachers questions and studying in the library but James has more of a social life. When there is limited knowledge of a person or what the person is capable of, the tendency is to look for the central or most important characteristics of the type: does Paul stay in to study rather than go to a party? (Hinton 2013). Furthermore, the prototype model assumes that knowledge about the stereotype is organized hierarchically from the most inclusive, broadest level (superordinate) down to a level in which more detailed distinctions are made across members (subordinate) (Devine and Barker 1991; Johnston and Hewstone 1992; Rosch 1978).

An alternative proposal for social categorization is the model of a “schema”. This model refers to the structure of our knowledge and beliefs about a particular concept (such as a type of object or person). Our schemas help us recognize, interpret and label stimuli; that is, they enrich our understanding of the world (Oakes and Turner 1990). For example, one might find it terrifying to learn of a group of people in masks surrounding an unconscious man who is having his chest cut open by one of them. However, if one knows that the people are ‘doctors’ and ‘nurses’ and that the unconscious man is a ‘patient’, then one can evoke the ‘hospital operating room’ schema and make sense of the situation. Also, one would be surprised and possibly shocked to find out that the person doing the surgery was a nurse rather than a doctor, as our schema tells us that it is the doctor who does the surgery (Hinton 2013). Fiske and Taylor (1991) refer to these as role schemas. Hence, a schema can impact the way we make inferences about people and events.

Prototypes and schemas are often used interchangeably, but Fiske and Taylor (1991) point out some differences between them. “A prototype of ‘male movie star’ might be something like Tom Cruise, with a touch of Tom Hanks and Keanu Reeves. Even though it is an abstraction,
the prototype has all the features specified: it includes youngish and clean-shaven as well as playing the hero in [Hollywood] movies. However, the schema for male movie star does not require all features to be specified - only the defining ones, such as playing the action hero and being a romantic lead. Sean Connery clearly fits into the schema of male movie star even though he is older than the three actors mentioned above (Hinton 2013, p. 47).” Furthermore, the schema concept emphasizes the relationship between the important features of the social category rather than developing a prototypical instance. Yet, as Fiske and Taylor (1991) suggest, since they both represent abstract representations of social categorization, there is a large overlap between the two concepts. These two concepts are used interchangeably in this study.

3.2.2.2 Stereotyping and social identity

Although stereotypes are not necessarily negative in nature, stereotypes about out-group members are more likely to be negative than those about in-group members, even when the attributes they include may seem to objectively positive (Hilton and Von Hippel 1996). As Alport (1954) noted “the personality qualities admired in Abraham Lincoln are deplored in the Jews”. (p. 189). Consistent with this view, social identity theory argues that through the cognitive process of social categorization and grouping, in-group members can perceive out-group members as more different than they really are - “they are not like us” - and as more similar than they really are - “they are all the same” - . That is, individuals in a group are perceived in terms of their group membership. Also, due to the motivational process of a positive in-group bias (i.e., in-group favouritism), the out-group will be viewed in (relatively) negative terms - “we are better than them” - . Fundamentally, social identity theory contends that, through the cognitive will develop a stereotypical view of the out-group members (perceiving them in terms of their out-group
identity), and through the motivational process of desiring to maintain a relatively high social identity (i.e., social status), the stereotype of out-group members will tend to be negative.

3.2.2.3 Stereotype-fit models and prototypes

Stereotype-fit models and prototypes have been used to explain how stereotypes and prototypes interact to create a glass-ceiling effect. These models attempt to describe the dynamics of possible cognitive bias in organizations when stereotyped group members do not fit a desired prototype. Two similar models are Heilman’s (1983) lack-of-fit model and Dipboye's (1985) stereotype-fit model. Heilman (1983) proposed that perceived lack-of-fit between stereotypically based attributes ascribed to minorities (e.g., women, African American) and the attributes ascribed to a prototype of a dominant group or majorities curtails a minority’s acceptance, participation, and advancement in organizations. According to Heilman (1983), the perceived characteristics of an individual are compared to the perceived characteristics of a job (i.e., skills and abilities). As a result, an individual can be perceived either a poor or good fit, and thus it also gives rise to expectations of success and failure. For example, the characteristics of a good leader are typically and predominantly associated with masculine traits. Because the typical attributes ascribed to women (e.g., kind, caring, and relationship-oriented) do not match the typical masculine traits (e.g., tough, forceful, and achievement-oriented), women are assumed to be a poor fit for leadership positions. A similar study on racioethnic managers found that Caucasian managers were perceived to possess more managerial characteristics in common with a successful-manager prototype than either African American and Hispanic managers (Chung-Herrera and Lankau 2005).

Similarly, Dipboye (1985) suggested that people (e.g., evaluators, raters) possess different cognitive schemas, implicit theories, and prototypes both for the individual being
assessed and for the ideal job incumbent. According to Dipboye (1985), evaluators rate an individual’s performance favourably when there is a fit between the stereotype of people similar to the individual (i.e., ratee) and their stereotype of the job. Also, as explained by the social identity theory, perceptions of out-groups (i.e., who are usually the evaluators) tend to accentuate those cognitive bias often resulting in discrimination and prejudice against minorities. Hogg and Terry (2000) examine social identity and self-categorization processes in organizations and suggest that minorities may be less likely to attain top leadership positions in organizations because they do not match the prescribed organizational prototype of a good and successful leader.

Due to the implications of these fit models for decisions related to acceptance, participation, and promotion decisions, this study compares the perceptions of CIOs held by perceivers outside the IT profession (i.e., with little or no IT background and also considered out-group members) against the profile of a C-level prototype. Also, because perceptions of CIOs have been influenced by stereotypical beliefs of IT professionals, the study contrasts perceptions of CIOs with those of IT professionals.

3.2.2.4 Prototypes of business leaders

Business leaders or C-level executives (i.e., sometimes referred to as the Top Management Team) are responsible for one or more functional areas in their organizations. However, once a functional business manager reaches the C-suite, his or her functional expertise becomes less important than his or her qualities as an effective leader (Groysberg et al. 2011). That is, C-level executives are expected to possess similar leadership skills and competences once they reach this level in the organization.
A number of studies have suggested that there are schemas and prototypes for a good manager (e.g., Powell and Butterfield 1997; Rush and Russell 1988) as well as an implicit theory of leadership⁹ (Brodbeck et al. 2000; Rush et al. 1981). Gerstner and Day (1994) define a manager prototype as a cognitive summary of characteristics that include traits, skills, and abilities that people attribute to the category of manager. A typical successful manager is perceived as intelligent, aggressive, assertive, and as having verbal ability, industriousness (Hogan and Kaiser 2005), self-confidence, emotional balance, diligence (Bentz 1990), desire for advancement, energy, charisma, and decisiveness (Howard and Bray 1988); in summary, successful managers have a combination of leadership ability and analytical skills (Heilman et al. 1989).

3.2.2.5 Prototypes of IT professionals

Numerous scholars have identified features of a typical IT professional (e.g., García-Crespo et al. 2008; Leidner et al. 2013; Moore and Love 2011; Pfleging and Zetlin 2006). These features and personality traits in combination yield a long-standing¹⁰ stereotype that is not particularly positive in a business context (Garcia-Marques et al. 2006; Pfleging and Zetlin 2006).

A typical IT professional is portrayed as someone who is nerdy, intelligent, skilled in mathematics and programming, and lacking in social graces who tends to work long hours in a

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⁹ The Implicit Leadership Theory (ILT) suggests that there is a collection of beliefs and assumptions that we have about a good leader; and we then attribute certain traits and behaviors to someone we consider to be a good leader (Brodbeck et al. 2000).

¹⁰ In explaining the brief history of the gap between those who work with technology and those who don’t (i.e., ‘geek gap’), Pfleging and Zetlin (2006) state: “misunderstanding between those in technology and the people they work with has existed since well before the first computer, since even before Benjamin Franklin first experimented with electricity. At issue is not what technology does or how it works, but how it is perceived. Through ages, ‘geeks’ [those who work in technology] have investigated and learned, building ever new and better devices, to advance knowledge and technology. Meanwhile, their employees have concerned themselves only with the practical—and sometimes political—effect of new inventions or discoveries. Each group has been right, in its own way. Rarely has either understood the needs and values of the other, and often this has meant trouble for both.”(p. 39)
solitary fashion. This is the well-known “technology geek” stereotype that features the social and business ineptness of IT professionals (Moore and Love 2011).

Deficiencies in communication skills and business knowledge are what business people (i.e., non-IT professionals) consider to be an undesirable difference between them and IT professionals (Pfleger and Zetlin 2006). This difference has been identified as the ‘geek gap’ between suits (i.e., business people) and geeks (i.e., IT people). Three fundamental differences appear to constitute this gap: product versus process orientation; solving problems versus influencing people; and the use of unshared language (e.g., technical acronyms). The product versus process refers to the tendency of IT professionals to prefer the act of creating something often with little regard for the usefulness of the finished product. IT professionals also enjoy solving puzzles and exercising their minds by creating or implementing new technologies with no interest in selling a product or influencing a customer’s perception. For business people, influencing others - the ability to connect with others and make them feel understood - is their crucial trait. These previous differences result in skills and priorities that are reflected in how IT professionals and business people communicate. Business people generally complain about IT professionals’ inability or unwillingness to communicate. This is evident when IT professionals are described as being ‘too technical’ but seldom are described as having ‘too much technical expertise’. Dugan (2001) defines the “techie-business gap” as the span that separates the technologist’s mindset from that found in other areas of the business.

3.2.2.6 Are CIOs perceived more similar to a C-level executive or an IT professional?

Practitioners and scholars suggest that, in spite of their C-level title, some CIOs are still perceived, as IT professionals when among senior executives and sometimes are not considered part of the leadership team at all. Peppard (2010) suggests that one of the challenges that hinder
CIOs’ ability to successfully perform in their organization is overcoming this IT stereotype. In Peppard (2010)’s study, some of the CIOs stated that they have encountered situations where they felt that they were regarded as “being technical and so only interested in technical matters, as not great communicators, and as lacking vision and management experience.” Although this has not been the case for all CIOs, anecdotal evidence suggests that it still prevails. Table 1 summarizes the positive and negative aspects of the stereotypical beliefs attributed to CIOs.

Table 1 Positive and negative aspects of IT stereotypical beliefs attributed to CIOs

<table>
<thead>
<tr>
<th>Positive Attributes/traits</th>
<th>Negative Attributes/traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task-focused(^a)</td>
<td>Poor communicators(^a,f,g)</td>
</tr>
<tr>
<td>Detail-oriented(^a)</td>
<td>‘geeks and not business professionals(^b)</td>
</tr>
<tr>
<td>‘focus on business models and processes before focusing on technology’(^b)</td>
<td>can’t listen –only lecture…they talk at –not to- business managers(^f)</td>
</tr>
<tr>
<td>Highly motivated(^c) – ‘there is no substitute for a CIO’s passion for the industry and the business that he or she is in’</td>
<td>Socially inept – unable to build relationships(^a,i)</td>
</tr>
<tr>
<td>Politically-oriented(^d); Savvy negotiator(^d); Entrepreneur(^e)</td>
<td>Nerd(^i)</td>
</tr>
</tbody>
</table>

Source: a(Willcoxson and Chatham 2006); b (Gupta et al. 2009); c (Trandafir 2011); d (Dawson and Watson 2011) e (Martinotti 2005); f (Keen 1997); g(Cook 2011); h (Peppard 2010); i (Pfleging and Zetlin 2006); j (García-Crespo et al. 2008)

It is evident from Table 1 that CIOs share attributes with IT professionals and business leaders – perhaps more from the former than the later. Therefore, this research will compare and contrast perceptions of CIOs with both IT professionals and C-level executives. I propose that the general stereotypical profile of CIOs is more similar to the IT professional prototype than to the C-level executive’s prototype. In addition to anecdotal evidence mentioned in the previous paragraph, there are other reasons to think that this may be the case. First, CIOs are junior members of the C-suite because IT has only recently emerged as a top-management function. The managerial presence of the IT department started in the early eighties whereas other functions
such as finance and marketing have been around a lot longer than IT. For instance, organizations have always had to manage the sale of products and services but computers have only been involved with organizations since the 1960s. Therefore other senior executives (i.e., the business side) are still considered the predominant group in these positions; thereby the dominant group’s values, beliefs, and lifestyles serve as the standard of comparison and as the key point of reference (Ragins 1997; Ramirez 1988).

Second, most senior managers are uncomfortable with IT (Heller 2013). Prior to being considered a top-business function, IT was entrenched in computer science, evincing a jargon that was difficult to comprehend for any but the cognoscenti. CEOs and other senior executives have typically some experience in finance, sales, and operations, but have little or no experience in IT and they do not understand the function, its tools, its staff, or, most critically, where all the money goes (Heller 2013). This clearly creates uncertainty and confusion among members of the executive committee and predisposes them to separate themselves from IT. Third, lingering perceptual biases are often perpetuated by the small size of IT groups within organizations: smaller groups or minorities tend to be less powerful than majority groups. Hence, “stereotypes associated with minority groups are distorted to incorporate characteristics that are antithetical to dominant perceptions of power (i.e., minority groups may be viewed as weak, supportive, and lacking initiative)” (Ragins 1997, p. 495). Ragins (1997) suggests that the image of power in organizational settings echoes attributes associated with dominant or majority groups.

Research has also shown that attributes are ordered within categories from most to least prototypical and are searched and accessed differentially Lord (1985). For example, since occupational prototypes (e.g., accountant, IT professional) exist at a higher level of categorization than role prototypes (e.g., senior manager), they tend to dominate consideration of role prototypes
which exist at a finer and weaker level of distinction (Rosch 1999). Also, perceptions of similarity and difference will lead to the use of particular categories (Turner and Reynolds 2001). If an individual perceives a dimension that distinguishes between two groups of people, and furthermore the differences between are perceived as greater than differences within groups, then it is likely to be a salient category. Thus, in the context of business leaders, IT may be the salient category that differentiates those closely involved with it from those who are not. Therefore, I propose that, when business students and senior managers are asked to think about CIOs during an experimental task, their perceptions of the general stereotype of IT professionals and/or associations with the profession (e.g., technology) will be triggered first. Furthermore, I propose that the trait or attribute inferences associated with perceptions of the stereotypical profiles of C-level managers will not correspond highly with perceptions of the CIO. Hence, the following hypothesis is offered:

**Hypothesis 1:**
CIOs will be perceived as being more similar to an IT professional profile than a general C-level profile.

Within this hypothesis, this research explores how the CIO stereotypical profile is similar to (or different from) the prototypes of IT professionals and/or a general C-level executive. This exploration is consistent with previous studies on comparison between men, women, and the successful-manager characteristics (Brenner et al. 1989; Heilman et al. 1989) and comparison between minority-manager and the successful middle-manager profiles (Chung-Herrera and Lankau 2005). I then explore descriptive profiles with the following research question:

**Research Question 1:**
On which attributes are CIOs perceived as significantly different from (or similar to) the IT professional and C-level executive prototypes?
Westphal and Milton (2000) found that functional background could be considered a salient characteristic in corporate boards. Individuals within a functional area usually possess similar cognitive structures due to sharing similar educational background and experience, thereby creating the basis for a functional categorization.

This categorization can result in positive or negative outcomes. On one hand, individuals with similar backgrounds and experiences can develop a shared understanding that can enhance strategic decision making (Nemeth and Kwan 1987; Wood et al. 1994). On the other hand, a negative bias from this categorization occurs when in-group members (i.e., similar backgrounds and experiences) evaluate the competence of out-group members more negatively. For example, out-group categorization may lead professionals with marketing backgrounds to stereotype professionals with finance backgrounds as “number crunchers who lack an understanding of the customer” (Westphal and Milton 2000; p. 369).

To the extent that functional differences create salient distinctiveness between professional groups in organizations, functional differences between business and IT may prompt senior executives to perceive the CIO as an out-group member of the leadership team. As mentioned earlier, the lack of understanding about the IT function prompts CEOs and other senior executives to feel uncomfortable with the function resulting in a lack of shared understanding and the tendency to differentiate themselves from people associated with IT. Therefore, when rating the attributes of CIOs in comparison to CFOs and CMOs, I believe that the perceptions related to the IT stereotypical profile will spill over to the assessment of CIOs and therefore, CIOs will be profiled differently than the other two C-level executives. In particular, the differences will occur with respect to leadership attributes. Because of the stereotypical traits associated with IT
professionals, CIOs will be viewed as less competent in terms of social skills and leadership ability. Hence, the following hypothesis is offered:

_Hypothesis 2:_
CIOs will be profiled differently than CFOs and CMOs. Specifically, CIOs will be perceived as less competent than CFOs and CMOs in terms of social skills and leadership ability.

Similar to the previous hypothesis, another objective of this research is to provide descriptive profiles of how CIOs are perceived to be similar to (or different from) CFOs and CMOs. I then explore these descriptive profiles with the following research question:

_Research Question 2:_
On which attributes are CIOs perceived as significantly different from (or similar to) CFOs and CMOs?

### 3.2.3 The persistence of stereotypes

Prior research on stereotype change (e.g., Johnston 1996; Macrae et al. 1994; Richards and Hewstone 2001) has proposed that, once stereotypes are established, they tend to endure and are resistant to change, even in the presence of disconfirming information. Johnston (1996) affirms that an important factor in this is the inclination of those holding stereotypes to give greater weight to cases that confirm their stereotypes than to cases that appear to counter the stereotype. Studies have demonstrated that people tend to apply information-seeking strategies to stereotype-matching information that help maintain pre-existing stereotypic beliefs (Johnston 1996; Macrae et al. 1994). This process can take the form of a self-fulfilling prophecy (Snyder et al. 1977), where action taken on the basis of a stereotypical view of an individual or group leads to consequences that reinforce the stereotype. These studies have largely been confirmed in the context of vocational aspirations for high school students and hiring practices in organizations.
In the context of vocational aspirations, stereotypes play an important role when choosing an occupation. The most salient example in this context is the gender-stereotyped occupations. Women tend to prefer stereotypically female occupations, whereas men prefer stereotypically male occupations. Some of the negative consequences of this segregation are due to the fact that female-stereotyped occupations tend to be lower-paying and less prestigious than male-stereotyped occupations. Consequently, this segregation often results in women having far more limited opportunities for advancement that is typical for men, thereby reinforcing the perpetuation of occupational stereotypes (Vondracek and Porfeli 2006). A similar segregation seems to occur among undergraduate business students wishing to pursue a business specialization area.

In an attempt to understand the low enrolment of undergraduate students in IS majors, Tu and McKeen (2011) used a 22-item bipolar scale of adjectives (e.g., “active-passive”) to examine undergraduate business students’ perceptions of three different professions: marketing, finance, and IS. Different profiles emerged for each profession following a classical stereotypical view; that is, profiles were taken to the extreme (e.g., marketers were trendy, IT professionals were nerdy). These results were expected for freshmen students given their limited life and work experience. But surprisingly, these stereotypical profiles did not change over the student’s four years of their business program. Despite taking advanced courses in different areas of specialization, working in summer-internships and being forced to make career decisions, students’ stereotypes remained unchanged. These results confirm the persistence of occupational stereotypes over time and also suggest that students enter their professional life armed with stereotypical beliefs that likely influence their inter-professional interactions (Carpenter 1995; Hind et al. 2003; Mandy et al. 2004).
In promotion or hiring contexts, and despite the developments of fair hiring practices, recruiters tend to favour those candidates that match their stereotypical profile (Glick et al. 1995). For example, a recruiting agent may have a stereotypical view of accountants as “good at numbers, but bad at words”, and subsequently may favour candidates offering such attributes. This will tend to perpetuate the stereotype. Even where high-profile individuals in a particular group seem to challenge the stereotype, they may be identified as a “subtype” rather than leading to a revision of the stereotype (Kunda and Oleson 1995).

The subtyping (i.e., subtypes) model has been proposed as a mechanism to explain stereotype persistence. As explained earlier, stereotypes can be organized hierarchically, so that higher-level categories can contain subordinate categories, defined as subtypes or subgroups. A subtype is one way in which perceivers accommodate a person or persons who disconfirm the overall group stereotype (Richards and Hewstone 2001) as illustrated in the accountant example. Another example is the subtype of a Black businessman whose characteristics differ quite sharply from the characteristics of the broader category of Blacks (Devine and Baker 1991). As such, in order to preserve the stereotype of blacks, perceivers create a category of a black businessman that is functionally distinct from the category of blacks. In this case, activating the stereotype of blacks does not activate the stereotype of a black businessman and vice versa (Devine and Baker 1991; Sinclair and Kunda 1999). Because subtyping preserves the original stereotype, it reduces the likelihood of changing stereotypes, thereby perpetuating negative stereotypes of the broader category (e.g., Blacks, Women).

Another subordinate category is a “subgroup” which refers to a smaller group within the larger category, but in contrast to a subtype, it includes targets that share many characteristics of the larger group stereotype despite having a few characteristics that are different (Richards and
Hewstone 2001). For example, subgroups like grandmotherly type, elder statesman, and senior citizen share many qualities with the superordinate category of the elderly (Brewer et al. 1981). Similarly, white businessmen form a subgroup in that they share many characteristics with the superordinate group of whites (McCabe and Brannon 2004). Subgroups may also have a counterpart subtype that is related to another group. For example, white businessmen, a subgroup of whites, might have a lot in common with Whites in general. Yet, black businessmen might be a subtype of blacks where they are different enough from blacks to merit a new group with unique characteristics. In this case, the subtype “black businessmen” might be more similar to “white businessmen” than to blacks as a whole (McCabe and Brannon 2004; Richards and Hewstone 2001).

Taken together, these empirical and theoretical concepts provide a rationale for the potential persistence of the prototypical (i.e., stereotypical) profile of CIOs. I propose that, subject to the confirmation of H1 and H2, if the standard stereotype of CIOs is different from that of C-level executives (i.e., possessing less leadership skills than general C-level executives), the existence of some CIOs who demonstrate high leadership achievements may not lead to a general revision of the stereotype; instead, these CIOs will be identified as a subtype, thereby leaving the existing CIO stereotype unchanged, or perhaps they will not be considered to be “real” CIOs at all. Therefore, the general CIO stereotype will tend to persist and remain stable over time. Therefore, an additional objective of this research is to examine the undergraduate students’ and senior managers’ prototypical profiles of CIOs, IT professionals, and C-level executives as a proxy to evaluate the stability and persistence of those beliefs over time. Specifically, the following hypothesis is proposed:

Hypothesis 3:
Business students and senior managers will have similar prototypical profiles of CIOs, IT professionals and C-level executives.

### 3.3 Studies 1 and 2: Experimental Design and Results

The general purpose of the following two studies was to examine the content of CIO stereotypes relative to IT professionals and other C-level executives. Specific attributes within stereotypes, including their content, strength, and consistency, were explored in these studies in order to establish the necessary groundwork to examine the processes by which CIO stereotypes may impact the CIOs’ role in organizations. In addition to examining the stereotype content, each study was designed to test the specific hypotheses of the overall research.

Study 1 compared the stereotype content of CIOs to the stereotype content of IT professionals and a general C-level executive. The purpose was to test the hypothesis (H1) that CIOs in general are perceived as being more similar to IT professionals than to C-level executives by gathering empirical evidence to determine whether or not CIO stereotypes are rooted in the IT stereotype. Specifically the study explored the salient aspects of the IT stereotype that makes CIOs different from general C-level executives and similar to IT professionals.

The purpose of study 2 was to compare the stereotypical profiles of CIOs, CFOs, and CMOs. In this study, I tested the hypothesis (H2) that CIOs are profiled differently than CFOs and CMOs and that the differences occur with respect to social skills and leadership ability. This study attempted to empirically respond to the anecdotal assertion by Peppard (2010) and others that CIOs are often considered the “last among equals”.

By surveying two types of respondents with different work experiences (i.e., students and senior managers), an additional purpose of studies 1 and 2 was to examine the persistence and stability of the prototypical profiles over time (H3). The first set of respondents was business
students from a major North American business school who volunteered to complete an online survey in return for course credit. The students responded to the survey in a supervised classroom setting. The second set of respondents was senior managers attending three different one-week executive education programs at the same business school, who volunteered to complete a paper-based survey in the classroom under supervision. These managers had greater than ten years of experience, many were CEOs, had diverse backgrounds and came from different parts of Canada.

Because the aim of the research was to measure the broad stereotypical beliefs held by individuals outside the IT profession, participants with high IT-related experience (i.e., IT managers, CIOs) and students majoring in IT (i.e., information systems) were removed from the analyses. Self-stereotyping is an important cognitive process but falls outside the scope of this study. In addition, people’s evaluation of their own in-group’s stereotype can be quite different from the evaluation the population at large has of the stereotype (Burris and Jackson 2000).

In the next section, I discuss each of these studies in detail.

3.3.1 Study 1

3.3.1.1 Sample

The first sample consisted of 139 undergraduate business students (55% female). Participants were randomly assigned to evaluate one of three individuals – a CIO, an IT professional, or a general C-level executive. The sample yielded 49 rankings of CIOs, 47 rankings of IT professionals, and 43 rankings of C-level executives. The second sample consisted of 65 senior managers from large- and medium-sized Canadian organizations from various industries (Table D-1 Demographic statistics for the senior manager sample). Identical to the student sample, these senior managers were randomly assigned to one of three treatments (CIO,
This sample yielded 22 rankings of CIOs, 21 rankings of IT professionals, and 22 rankings of C-level executive.

3.3.1.2 Measures

For this study, I employed a combination of free responses and trait ratings procedures for assessing stereotype content. The free responses procedure consists of asking participants to list attributes that they associate with a given group (i.e., a thought-listing procedure). This general measurement strategy has been used to assess individual, personal beliefs through the activation of cognitive representations about specific target groups (Devine 1989). The strength of this procedure is that it captures attributes that can be central to people’s stereotypes; however it may not identify the critical content of stereotypes because participants may not recall or record all of the attributes that they associate with a group (Madon 1997). Therefore, I used trait (adjective) ratings to include a broad range of attributes to enable the respondents to examine multiple components of a given individual. With trait ratings, participants are presented with a predetermined list of traits from which they were asked to indicate the extent to which each trait characterizes an individual (i.e., CIO, IT professional, or C-level executive). These measures have been widely used in examining the content of stereotypes (Dovidio et al. 1986; Schneider and Bos 2011) and, as suggested by Stangor and Lange (1994), a combined procedure maximizes the strength of each individual procedure while at the same time minimizing their weaknesses.

Free-response measure

Participants were randomly assigned to one of three treatments and instructed to list descriptors or characteristics that were perceived to be typical CIOs, IT professionals or C-level executives as a professional group. They were further instructed to think about the professional group as a whole, rather than a specific professional known to them. The participants were also
prompted to indicate the “first thoughts that came to their mind”. They were provided with 7 boxes (or lines for the paper-based version) for their responses.

**Adjective list measure**

I adopted a modified version of the experimental procedure developed by (Katz and Braly 1933), but based the trait list on the Adjective Check List (ACL) created by Gough and Heilbrun (1983)\(^{11}\). Three independent raters – two experts in the IS field and an expert in psychology scrutinized all 300 adjectives from the ACL to eliminate 1) any trait judged to be unrelated to the description of senior managers (e.g., attractive, bitter) and 2) traits considered redundant (i.e., highly related to one or more other items). After two rounds of independent selection and group discussion for disagreements, the list was reduced to 54 traits with unanimous agreement among the raters.

This reduced list was then enhanced with 10 additional stereotypical traits of IT professionals and senior managers found in the literature (e.g., nerdy, techy, geek, leader, strategic). I conducted a pretest on the resultant 64 traits, using the labels of IT professional, CIO and general C-level executive. A convenience sample of five graduate students from different business areas and two senior managers were invited to select the 10 most stereotypical traits for each label (i.e., CIO, IT professional and/or C-level executive). Using these results, the list was reduced to 34 traits (see Tables D-2.1 to D-2.4 Complete lists of the 34 attributes for the adjective list measure). For this task, a five-point scale was provided with the following options: 1 = very uncharacteristic, 2 = somewhat uncharacteristic, 3 = no more characteristic than any other professional group, 4 = somewhat characteristic, 5 = very characteristic.

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\(^{11}\) The ACL is a well-established clinical and personality research instrument widely used in the study of gender (e.g. Williams and Bennett 1975) and occupational stereotypes (Bobele et al. 1975; DeCoste and Rhode 1971). This list has also been validated against the NEO Personality Inventory and significant and extensive item overlap is found between the scales (Piedmont et al. 1991).
3.3.1.3 Procedure

After reading and granting their acceptance to conduct the study on “Perceptions Concerning different Professions” (see Appendix B), participants completed a questionnaire that assessed their beliefs about one of the three randomly-assigned business professions: CIO, IT professional, and C-level executive. For each reference group (e.g., CIO, IT professional, a C-level executive), participants were asked to first complete the free response task and then rate the reference group based on the 34 traits provided in the adjective list task. Participants were strongly encouraged to conduct the tasks consecutively without going back to change their answers. They were also reminded that the researchers were interested in their immediate thoughts and that there were no right or wrong answers. Demographic information was also collected. Upon completion of the questionnaire, participants were debriefed and dismissed.

Several steps were taken to address the possibility of social desirability bias. I adopted instructions from past research on stereotypes and prototypes. First, participants were asked about what “people in general” think of the different groups instead of asking for an individual stereotype of the particular groups. Second, the instructions pointed out that “organizations are composed of many different professionals” and that “organizational members form relatively well-defined impressions of their co-workers, managers, and subordinates”. These instructions were expected to ease participants’ reluctance to stereotype (see Appendix D-3 for instructions) (Garcia-Marques et al. 2006; Schneider and Bos 2011).

3.3.1.4 Results

The results are presented in two main sections. The first section compares the frequency and percentage of stereotypical attributes elicited during the free-response task among the three groups (e.g., CIO, IT, C-level). In the second section, I compared the stereotypical traits selected
from the adjective list across groups and conducted t-tests to identify statistical differences on highly selected traits.

**Free-response analysis**

A total of 649 free responses from the student sample (i.e., 209 for CIO with n=49, 205 for IT professional with n=47, 235 for C-level executive with n=43) and a total of 318 free responses from the senior manager sample (i.e., 96 for CIO with n=22, 96 for IT professional with n=21, 126 for C-level executive with n=22). The responses were coded in two steps. In the first step, three coders (two graduate students from MIS and one from OB) developed a general coding scheme, which consisted of the following types of attributes: profession-related characteristics (e.g., “computers”, “technology”), personality characteristics (e.g., “intelligent”, “social”), typical behaviour/attribute in the role (e.g., “fixing gadgets”, “managing others”, “highly responsible”, “high pay”), and others (e.g., “white”, “Asian”, “wear glasses”). The coders independently assigned each response from each group to these categories and agreed on 84.5% of the category judgments. Group discussion was subsequently used to resolve coding discrepancies. Second, the same coders used group discussion to determine which of the characteristics represented synonyms and to sort the characteristics into conceptually meaningful content categories. In this step, the categories derived from the personality characteristics were compared to the adjective list to evaluate concurrent validity. At this stage, the traits “sociable”, “friendly” and “extrovert” were combined because of their semantic overlap. When a trait listed by a participant did not correspond to an existing category, a new category was created. The judges agreed on 85% of the classification decisions. When there was a disagreement, a majority decision rule was used. Categories containing descriptors listed by 10% or more of the participants within each group (i.e., categories with 4 or more synonyms for the student sample
and categories with 2 or more synonyms for the senior manager sample) were selected as stereotypical attributes for comparison across the groups (Spencer-Rodgers 2001).

Table 2 Frequencies and percentage of descriptors cited in the free-response task (student sample)

<table>
<thead>
<tr>
<th>Trait Category</th>
<th>Total N responses</th>
<th>CIO N = 184</th>
<th>IT professional N = 194</th>
<th>C-level N = 188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality-related</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambitious&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6 (1.1%)</td>
<td>-</td>
<td>-</td>
<td>6 (3.2%)</td>
</tr>
<tr>
<td>Charismatic&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8 (1.4%)</td>
<td>-</td>
<td>-</td>
<td>8 (4.3%)</td>
</tr>
<tr>
<td>Detail-oriented&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25 (4.4%)</td>
<td>10 (5.4%)</td>
<td>10 (5.2%)</td>
<td>5 (2.7%)</td>
</tr>
<tr>
<td>Decision maker</td>
<td>4 (0.7%)</td>
<td>-</td>
<td>-</td>
<td>4 (2.1%)</td>
</tr>
<tr>
<td>Experienced</td>
<td>12 (2.1%)</td>
<td>-</td>
<td>-</td>
<td>12 (6.4%)</td>
</tr>
<tr>
<td>Geek/Social inept&lt;sup&gt;a&lt;/sup&gt;</td>
<td>46 (8.1%)</td>
<td>7 (3.8%)</td>
<td>39 (20.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Good communicator</td>
<td>4 (0.7%)</td>
<td>-</td>
<td>-</td>
<td>4 (2.1%)</td>
</tr>
<tr>
<td>Hard working</td>
<td>9 (1.6%)</td>
<td>-</td>
<td>4 (2.1%)</td>
<td>5 (2.7%)</td>
</tr>
<tr>
<td>Innovative&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17 (3%)</td>
<td>6 (3.2%)</td>
<td>4 (2.1%)</td>
<td>7 (3.7%)</td>
</tr>
<tr>
<td>Intelligent/smart</td>
<td>38 (6.7%)</td>
<td>-</td>
<td>21 (10.8%)</td>
<td>17 (9%)</td>
</tr>
<tr>
<td>Leader&lt;sup&gt;b&lt;/sup&gt;</td>
<td>32 (5.7%)</td>
<td>7 (3.8%)</td>
<td>-</td>
<td>25 (13.3%)</td>
</tr>
<tr>
<td>Numbers-oriented</td>
<td>8 (1.4%)</td>
<td>-</td>
<td>8 (4.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Powerful&lt;sup&gt;b&lt;/sup&gt;</td>
<td>25 (4.4%)</td>
<td>-</td>
<td>-</td>
<td>25 (13.3%)</td>
</tr>
<tr>
<td>Strategic/strategy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20 (3.5%)</td>
<td>5 (2.7%)</td>
<td>-</td>
<td>15 (8%)</td>
</tr>
<tr>
<td>Team player</td>
<td>10 (1.8%)</td>
<td>-</td>
<td>-</td>
<td>10 (5.3%)</td>
</tr>
<tr>
<td>Tech-savvy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>41 (7.2%)</td>
<td>10 (5.4%)</td>
<td>31 (16%)</td>
<td>-</td>
</tr>
<tr>
<td>Visionary</td>
<td>8 (1.4%)</td>
<td>-</td>
<td>-</td>
<td>8 (4.3%)</td>
</tr>
<tr>
<td>Role-related</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authority</td>
<td>8 (1.4%)</td>
<td>13 (7.1%)</td>
<td>-</td>
<td>8 (4.3%)</td>
</tr>
<tr>
<td>Efficiency of operations</td>
<td>26 (4.6%)</td>
<td>-</td>
<td>13 (6.7%)</td>
<td>-</td>
</tr>
<tr>
<td>Fixing IT issues</td>
<td>15 (2.7%)</td>
<td>-</td>
<td>15 (7.7%)</td>
<td>-</td>
</tr>
<tr>
<td>High pay</td>
<td>20 (3.5%)</td>
<td>-</td>
<td>-</td>
<td>20 (10.6%)</td>
</tr>
<tr>
<td>Increasingly Important</td>
<td>8 (1.4%)</td>
<td>4 (2.2%)</td>
<td>6 (3.1%)</td>
<td>-</td>
</tr>
<tr>
<td>IT-related characteristics&lt;sup&gt;b&lt;/sup&gt;</td>
<td>110 (19.4%)</td>
<td>85 (46.2%)</td>
<td>25 (12.9%)</td>
<td>-</td>
</tr>
<tr>
<td>Less important&lt;sup&gt;c&lt;/sup&gt;</td>
<td>27 (4.8%)</td>
<td>19 (10.3%)</td>
<td>8 (4.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Link IT with the business</td>
<td>6 (1.1%)</td>
<td>6 (3.2%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>8 (1.4%)</td>
<td>-</td>
<td>4 (2.1%)</td>
<td>4 (2.1%)</td>
</tr>
<tr>
<td>Stress</td>
<td>5 (0.8%)</td>
<td>-</td>
<td>-</td>
<td>5 (2.7%)</td>
</tr>
<tr>
<td>Wear glasses</td>
<td>4 (0.7%)</td>
<td>-</td>
<td>4 (2.1%)</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. Traits in bold are the fewest number required to account for 50% of the total number of categorized traits responses for each target group. Zero responses for a given category are indicated with a dash.

<sup>a</sup> Trait included in the ACL adjective list presented in this study.

<sup>b</sup> IT-related characteristics refers to descriptors associated with computers (e.g., hardware/software), data, information systems, information technology (e.g., infrastructure).

<sup>c</sup> Less important category includes responses such as “behind scenes”, “not crucial”, “supporting role”, “shelf-life”, “basement”.

43
Table 3 Frequencies and percentage of descriptors cited in the free-response task (senior manager sample)

<table>
<thead>
<tr>
<th>Trait Category</th>
<th>Total N responses</th>
<th>CIO</th>
<th>IT professional</th>
<th>C-level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 90</td>
<td>N = 97</td>
<td>N = 104</td>
<td></td>
</tr>
<tr>
<td><strong>Personality-related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambitious</td>
<td>7 (2.4%)</td>
<td>-</td>
<td>-</td>
<td>7 (6.7%)</td>
</tr>
<tr>
<td>Charismatic</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>4 (3.5%)</td>
<td></td>
</tr>
<tr>
<td>Competent</td>
<td>3 (1%)</td>
<td>-</td>
<td>3 (2.9%)</td>
<td></td>
</tr>
<tr>
<td>Confident</td>
<td>7 (2.4%)</td>
<td>3 (3.3%)</td>
<td>-</td>
<td>4 (3.5%)</td>
</tr>
<tr>
<td>Confusing/difficult</td>
<td>6 (2.1%)</td>
<td>2 (2.2%)</td>
<td>4 (4.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Controlling</td>
<td>2 (0.7%)</td>
<td>2 (2.2%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Decision maker</strong></td>
<td>14 (4.8%)</td>
<td>-</td>
<td>-</td>
<td>14 (13.5%)</td>
</tr>
<tr>
<td>Demanding</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>-</td>
<td>4 (3.5%)</td>
</tr>
<tr>
<td><strong>Detail-oriented</strong></td>
<td>21 (7.2%)</td>
<td>13 (14.4%)</td>
<td>8 (8.2%)</td>
<td>-</td>
</tr>
<tr>
<td>Experienced</td>
<td>11 (3.8%)</td>
<td>2 (2.2%)</td>
<td>-</td>
<td>9 (8.7%)</td>
</tr>
<tr>
<td><strong>Geek/Social inept</strong></td>
<td>20 (6.9%)</td>
<td>8 (8.8%)</td>
<td>12 (12.4%)</td>
<td>-</td>
</tr>
<tr>
<td>Good communicator</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>4 (3.5%)</td>
<td></td>
</tr>
<tr>
<td>Hard working</td>
<td>2 (0.7%)</td>
<td>-</td>
<td>2 (1.9%)</td>
<td></td>
</tr>
<tr>
<td>Innovative</td>
<td>17 (5.8%)</td>
<td>12 (13.3%)</td>
<td>5 (5.1%)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Intelligent/smart</strong></td>
<td>27 (9.3%)</td>
<td>4 (4.4%)</td>
<td>11 (11.3%)</td>
<td>12 (11.5%)</td>
</tr>
<tr>
<td><strong>Leader</strong></td>
<td>14 (4.8%)</td>
<td>-</td>
<td>14 (13.5%)</td>
<td></td>
</tr>
<tr>
<td>Open-minded</td>
<td>3 (1%)</td>
<td>-</td>
<td>3 (2.9%)</td>
<td></td>
</tr>
<tr>
<td>Poor communicator</td>
<td>3 (1%)</td>
<td>-</td>
<td>3 (3.1%)</td>
<td></td>
</tr>
<tr>
<td>Powerful</td>
<td>3 (1%)</td>
<td>-</td>
<td>3 (2.9%)</td>
<td></td>
</tr>
<tr>
<td>Rigid</td>
<td>3 (1%)</td>
<td>-</td>
<td>3 (3.1%)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Strategic/strategy</strong></td>
<td>13 (4.5%)</td>
<td>-</td>
<td>-</td>
<td>13 (12.5%)</td>
</tr>
<tr>
<td>Task-focused</td>
<td>2 (0.7%)</td>
<td>-</td>
<td>2 (2.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Team player/sociable</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>4 (3.5%)</td>
<td></td>
</tr>
<tr>
<td><strong>Tech-savvy</strong></td>
<td>14 (4.8%)</td>
<td>6 (6.7%)</td>
<td>9 (9.3%)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Role-related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost reduction</td>
<td>7 (2.4%)</td>
<td>7 (7.8%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Efficiency of operations</td>
<td>8 (2.7%)</td>
<td>5 (5.6%)</td>
<td>3 (3.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Expensive</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>4 (4.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Fixing IT issues</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>4 (4.1%)</td>
<td>-</td>
</tr>
<tr>
<td>High pay</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>-</td>
<td>4 (3.5%)</td>
</tr>
<tr>
<td><strong>IT-related characteristics</strong></td>
<td>32 (11%)</td>
<td>18 (20%)</td>
<td>14 (14.4%)</td>
<td>-</td>
</tr>
<tr>
<td>Less important</td>
<td>11 (3.8%)</td>
<td>3 (3.3%)</td>
<td>8 (8.2%)</td>
<td>-</td>
</tr>
<tr>
<td>Process-driven</td>
<td>8 (2.7%)</td>
<td>5 (5.6%)</td>
<td>3 (3.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Slow</td>
<td>4 (1.4%)</td>
<td>-</td>
<td>4 (4.1%)</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. Traits in bold are the fewest number required to account for 50% of the total number of categorized traits responses for each target group. Zero responses for a given category are indicated with a dash.

* Trait included in the ACL adjective list presented in this study.

IT-related characteristics refers to descriptors associated to computers (e.g., hardware/software), data, information systems, information technology (e.g., infrastructure).

Less important category includes responses such as “behind scenes”, “not crucial”, “supporting role”, “shelf-life”, “basement”.

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As shown in Table 3, the five largest categories for the student sample were IT-related characteristics (19.4% of the total responses), geek/social inept (8.1%), tech-savvy (7.2%), intelligent.smart (6.7%), and leader (5.7%). These five categories accounted for 47.1% of the total number of responses. For the senior manager sample, the five largest categories were IT-related characteristics (11%), intelligent.smart (9.3%), detail-oriented (7.2%), geek/social inept (6.9%), and innovative (5.8%) which accounted for 40.2% of the total number of responses. These responses and percentages suggest high consistency in participants’ responses and in the nature of the stereotype content across the two samples.

As suggested by previous research (e.g., Chang and Demyan 2007; Devine and Elliot 1995), stereotype content consistency within groups may be represented by a stereotype uniformity index which is the smallest number of traits required to account for 50% of the total number of trait responses.

For participants assigned to the CIO group, four trait categories comprised 56.5% of the total number of traits in the senior manager sample: IT-related characteristics (20%), detail-oriented (14.4%), innovative (13.3%), and geek/social inept (8.8%). In the student samples, only three categories comprised more than fifty percent: IT-related characteristics (46.2%), less important (10.3%), and efficiency of operations (7.1%).

For participants assigned to the IT professional group, 55.6% of senior managers’ responses were captured by five categories: IT-related characteristics (14.4%), geek/social inept (12.4%), intelligent.smart (11.3%), tech-savvy (9.3%), and detail-oriented (8.2%). Student responses were captured in three categories: geek/social inept (20.1%), Tech-savvy (16%), and IT-related characteristics (12.9%).
For participants assigned to the C-level executive group, four categories were needed to account for 51% of the traits named for the group by senior managers: decision maker (13.5%), leader (13.5%), intelligent/smart (11.5%), and strategic (12.5%). Three of these traits were also shared by students: leader (13.3%), intelligent/smart (9%), and strategic (8%). Students commonly agreed on two additional traits when describing a C-level executive: powerful (13.3%) and high pay (10.6%) which in total account for 54.2% of the traits named for this group by students.

Adjective list analysis

A trait was considered stereotypic if at least 67% of participants judged it as “very” or “somewhat” characteristic. The “very” or “somewhat” uncharacteristic and the no more or less characteristic items were not recoded. Frequencies between 67% and 100% are considered to reflect a strong majority (as done in Ashmore et al. 1986; Devine and Baker 1991; McCabe and Brannon 2004; Schneider and Bos 2011).

This analysis identified thirty stereotypical traits for the three groups combined in the student sample (see Table 4) and twenty-three stereotypical traits in the senior manager sample (see Table 5).

Table 4 Stereotypical attributes elicited from the adjective list task (student sample)

<table>
<thead>
<tr>
<th>(rated by over 67% of respondents)</th>
<th>CIO N = 49</th>
<th>IT professional N = 47</th>
<th>t-test</th>
<th>C-level N = 43</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>M</td>
<td>%</td>
<td>M</td>
<td>%</td>
<td>M</td>
</tr>
<tr>
<td>Resourceful</td>
<td>82.2%</td>
<td>4.13</td>
<td>92.5%</td>
<td>4.21</td>
<td>-1.773</td>
</tr>
<tr>
<td>Techy</td>
<td>80.5%</td>
<td>4.31</td>
<td>96.3%</td>
<td>4.85</td>
<td>-2.68*</td>
</tr>
<tr>
<td>Detailed-oriented</td>
<td>77.8%</td>
<td>4.22</td>
<td>100%</td>
<td>4.74</td>
<td>-2.93**</td>
</tr>
<tr>
<td>Task-focused</td>
<td>75%</td>
<td>3.86</td>
<td>77.4%</td>
<td>4.07</td>
<td>0.857</td>
</tr>
<tr>
<td>Introvert</td>
<td>72.2%</td>
<td>3.81</td>
<td>77.7%</td>
<td>4.04</td>
<td>-0.912</td>
</tr>
<tr>
<td>organized</td>
<td>69%</td>
<td>3.81</td>
<td>74%</td>
<td>3.93</td>
<td>-0.505</td>
</tr>
<tr>
<td>Innovative</td>
<td>67.1%</td>
<td>3.82</td>
<td>85.2%</td>
<td>4.48</td>
<td>-2.97**</td>
</tr>
</tbody>
</table>
Table 5 Stereotypical attributes elicited from the adjective list task (senior manager sample)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>CIO (N = 49)</th>
<th>IT Professional (N = 47)</th>
<th>t-test</th>
<th>C-level (N = 43)</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geek</td>
<td>67.1% 3.81</td>
<td>67.1% 3.81</td>
<td>0</td>
<td>14.3% 2.63</td>
<td>5.355**</td>
</tr>
<tr>
<td>Curious</td>
<td>50% 3.5</td>
<td>92.5% 4.37</td>
<td>-3.82**</td>
<td>68.5% 4.03</td>
<td>-2.158*</td>
</tr>
<tr>
<td>Determined</td>
<td>61.1% 3.56</td>
<td>77.5% 3.89</td>
<td>-1.12</td>
<td>94.3% 4.86</td>
<td>-5.361**</td>
</tr>
<tr>
<td>Nerdy</td>
<td>63.9% 3.78</td>
<td>81.4% 4.07</td>
<td>-1.269</td>
<td>11.4% 2.71</td>
<td>5.786**</td>
</tr>
<tr>
<td>Polished</td>
<td>33.4% 3.06</td>
<td>37% 3.26</td>
<td>-0.842</td>
<td>97.1% 4.4</td>
<td>-7.233**</td>
</tr>
<tr>
<td>Leader</td>
<td>33.3% 3.03</td>
<td>18.5% 2.59</td>
<td>1.625</td>
<td>97.1% 4.71</td>
<td>-8.250**</td>
</tr>
<tr>
<td>Confident</td>
<td>33.4% 3.03</td>
<td>40.7% 3.11</td>
<td>-0.337</td>
<td>97.2% 4.8</td>
<td>-9.822**</td>
</tr>
<tr>
<td>Strategic</td>
<td>61.9% 3.61</td>
<td>48.1% 3.78</td>
<td>-0.470</td>
<td>94.3% 4.54</td>
<td>-4.693**</td>
</tr>
<tr>
<td>Ambitious</td>
<td>39.7% 3.12</td>
<td>48.1% 3.3</td>
<td>-0.413</td>
<td>94.3% 4.77</td>
<td>-7.715**</td>
</tr>
<tr>
<td>Dominant</td>
<td>16.7% 2.43</td>
<td>15.9% 3.0</td>
<td>-1.84</td>
<td>94.3% 4.34</td>
<td>-8.638**</td>
</tr>
<tr>
<td>Driven</td>
<td>41.6% 3.99</td>
<td>51.8% 3.44</td>
<td>-0.119</td>
<td>94.3% 4.63</td>
<td>-5.861**</td>
</tr>
<tr>
<td>Assertive</td>
<td>33.4% 3.49</td>
<td>29.6% 2.93</td>
<td>0.076</td>
<td>88.6% 4.31</td>
<td>-6.325**</td>
</tr>
<tr>
<td>Charismatic</td>
<td>19.5% 2.67</td>
<td>25.9% 2.59</td>
<td>0.302</td>
<td>88.6% 4.43</td>
<td>-8.885**</td>
</tr>
<tr>
<td>Persevering</td>
<td>50% 3.41</td>
<td>55.5% 3.63</td>
<td>-0.827</td>
<td>88.6% 4.26</td>
<td>-4.308**</td>
</tr>
<tr>
<td>Enterprise</td>
<td>36.1% 3.29</td>
<td>22.2% 3.04</td>
<td>1.82</td>
<td>85.7% 4.2</td>
<td>-5.055**</td>
</tr>
<tr>
<td>Extrovert</td>
<td>13.9% 2.56</td>
<td>11.1% 2.15</td>
<td>1.728</td>
<td>82.9% 4.14</td>
<td>-7.478**</td>
</tr>
<tr>
<td>Sociable</td>
<td>30.2% 3.03</td>
<td>14.8% 2.44</td>
<td>2.709**</td>
<td>82.9% 4.17</td>
<td>-6.037**</td>
</tr>
<tr>
<td>Tactful</td>
<td>38.9% 3.28</td>
<td>55.5% 3.56</td>
<td>-1.258</td>
<td>80% 4.26</td>
<td>-5.172**</td>
</tr>
<tr>
<td>Enthusiastic</td>
<td>36.2% 3.14</td>
<td>29.6% 2.78</td>
<td>1.396</td>
<td>74.3% 4.23</td>
<td>-5.074**</td>
</tr>
<tr>
<td>Energetic</td>
<td>19.5% 2.79</td>
<td>14.8% 2.59</td>
<td>0.662</td>
<td>77.2% 4.11</td>
<td>-6.732**</td>
</tr>
<tr>
<td>Outspoken</td>
<td>22.2% 2.86</td>
<td>22.2% 2.56</td>
<td>1.242</td>
<td>77.2% 4.09</td>
<td>-5.397**</td>
</tr>
<tr>
<td>Aggressive</td>
<td>13.9% 2.5</td>
<td>11.1% 2.15</td>
<td>1.412</td>
<td>77.1% 4.11</td>
<td>-7.793**</td>
</tr>
<tr>
<td>Talkative</td>
<td>19.5% 2.69</td>
<td>11.1% 2.48</td>
<td>0.92</td>
<td>77.1% 4.03</td>
<td>-6.205**</td>
</tr>
</tbody>
</table>

Note: Cell entries are the percentage of participants who rated the attribute as “very” and “somewhat” characteristic.

*p < .05, ** p < .01.

* The italicized traits represent the stereotypical traits of CIOs.

Table 5 Stereotypical attributes elicited from the adjective list task (senior manager sample)
Comparison 1: CIO and IT  
Comparison 2: CIO and C-level

<table>
<thead>
<tr>
<th>Trait</th>
<th>CIO N = 22</th>
<th>IT professional N = 21</th>
<th>t-test</th>
<th>Comparison 2: CIO and C-level</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assertive</td>
<td>57.2%</td>
<td>22.7%</td>
<td>2.8</td>
<td>2.297*</td>
<td>100%</td>
</tr>
<tr>
<td>Confident</td>
<td>42.8%</td>
<td>22.7%</td>
<td>2.6</td>
<td>2.258*</td>
<td>100%</td>
</tr>
<tr>
<td>Driven</td>
<td>42.8%</td>
<td>50%</td>
<td>3.4</td>
<td>.901</td>
<td>95.7%</td>
</tr>
<tr>
<td>Leader</td>
<td>4.8%</td>
<td>27.2%</td>
<td>3</td>
<td>1.437</td>
<td>91.3%</td>
</tr>
<tr>
<td>Resourceful</td>
<td>61.9%</td>
<td>63.6%</td>
<td>3.6</td>
<td>.064</td>
<td>91.3%</td>
</tr>
<tr>
<td>Strategic</td>
<td>61.9%</td>
<td>18.1%</td>
<td>2.7</td>
<td>3.001</td>
<td>91.3%</td>
</tr>
<tr>
<td>Determined</td>
<td>57.1%</td>
<td>59.1%</td>
<td>3.6</td>
<td>.422</td>
<td>87%</td>
</tr>
<tr>
<td>Persevering</td>
<td>61.9%</td>
<td>45.4%</td>
<td>3.6</td>
<td>1.945</td>
<td>82.6%</td>
</tr>
<tr>
<td>Energetic</td>
<td>28.6%</td>
<td>18.1%</td>
<td>2.9</td>
<td>.912</td>
<td>78.3%</td>
</tr>
<tr>
<td>Dominant</td>
<td>38.1%</td>
<td>13.6%</td>
<td>2.8</td>
<td>3.197*</td>
<td>78.2%</td>
</tr>
<tr>
<td>Enterprising</td>
<td>47.6%</td>
<td>45.4%</td>
<td>3</td>
<td>1.114</td>
<td>73.9%</td>
</tr>
<tr>
<td>Polished</td>
<td>14.3%</td>
<td>45.4%</td>
<td>3</td>
<td>1.114</td>
<td>73.9%</td>
</tr>
<tr>
<td>Sociable</td>
<td>14.3%</td>
<td>4.5%</td>
<td>2.3</td>
<td>2.456*</td>
<td>69.5%</td>
</tr>
<tr>
<td>Charismatic</td>
<td>4.8%</td>
<td>4.5%</td>
<td>1.9</td>
<td>.688</td>
<td></td>
</tr>
</tbody>
</table>

Note: Cell entries are the percentage of participants who rated the attribute as “very” and “somewhat” characteristic.
*p < .05, ** p < .01.

The italicized traits represent the stereotypical traits of CIOs.

The comparison between CIOs and IT professionals reveals that students and senior managers stereotypically perceive CIOs and IT professionals as “techy”, “geek”, “detail-oriented”, “task-focused”, and “nerdy” (i.e., italicized in tables). Within the senior manager sample, no statistical differences were found between CIOs and IT professionals regarding these five traits, but the student sample perceived IT professionals as significantly more techy and detail-oriented than CIOs. Students also stereotypically characterized CIOs and IT professionals as “resourceful”, “introvert”, “organized”, and “innovative”. There were no significant differences between CIOs and IT professionals for the first three of these traits across the two samples, but students reported IT professionals as significantly more innovative than CIOs whereas senior managers reported CIOs as significantly more innovative than IT professionals. In regard to traits that were not classified as stereotypical (i.e., less than 67% of respondents rated as
“very” or “somewhat” characteristic) and in order of majority (i.e., from the largest to smallest frequency), senior managers described CIOs as significantly more strategic, assertive, ambitious, outspoken, aggressive, dominant, talkative, polished, and extrovert than IT professionals. Students only reported CIOs as being significantly more sociable than IT professionals, but IT professionals as significantly more curious.

The comparative analysis between CIO and C-level executives indicates that students and senior managers perceive these professionals groups as significantly different from each other on most of the traits used in the adjective list. For instance, on all the stereotypical beliefs assigned to a C-level executive (e.g., ambitious, assertive, confident, driven, leader, resourceful, strategic, determined, persevering, dominant, enterprising, polished, sociable and charismatic), CIOs were perceived significantly lower than a C-level executive. Similarly, on most of the stereotypical beliefs assigned to CIOs (e.g., techy, geek, innovative, and nerdy), general C-level executives were perceived significantly lower than CIOs. CIOs were also perceived as higher on detail-oriented by senior manager.

Next, the list of attributes from the adjective list was subjected to an exploratory factor analysis (EFA) to identify the underlying dimensions of traits. Due to the consistency of their responses, the senior manager and student samples were combined for this analysis. As recommended by Fabrigar and Wegener (2011), multiple methods were used to decide how many factors to retain. The methods used were the scree plot, the parallel analysis method, and model fit (please refer to Appendix D-4 for details of this procedure). Two meaningful factors were extracted: one factor was related to “leadership” whereas the other factor was related to “problem-solving”. The variables forming this construct are similar to those found in prior research describing the “problem solver” archetype of IT project managers (see Napier et al.)
2009). The specific components (in order of statistical contribution) of these factors and their reliability scores can be found in Table 6. I also used t-tests to compare the mean differences across the groups for each of the factors and by sample. The results for student and senior manager samples are found in Table 7 and Table 8 respectively.

**Table 6 Meaningful factors and contributing items**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Traits</th>
<th>Cronbach’s alpha</th>
<th>Number of items in the scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1:</td>
<td><strong>Leadership</strong> Leader, charismatic, ambitious, polished, sociable, confident, driven, extrovert, dominant, energetic, assertive, talkative, introvert(^a), outspoken, nerdy(^b), aggressive, enthusiastic, enterprising, unambitious(^a), reserved(^b), tactful, geek(^a), conservative(^b).</td>
<td>.951</td>
<td>23</td>
</tr>
<tr>
<td>Factor 2:</td>
<td><strong>Problem-solving</strong> Detail-oriented, innovative, task-focused, curious.</td>
<td>.650</td>
<td>4</td>
</tr>
</tbody>
</table>

a. Items loading negatively – reversed items.

**Table 7 Mean differences for the factors between CIOs and IT professionals and between CIOs and C-level executives (t-test) (student sample)**

<table>
<thead>
<tr>
<th></th>
<th>CIO</th>
<th>IT</th>
<th>T-test</th>
<th>C-level</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=</td>
<td>49</td>
<td>47</td>
<td></td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>2.8 (.58)</td>
<td>2.6 (.56)</td>
<td>.679</td>
<td>4.1 (.36)</td>
<td>-11.828**</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>3.8 (.71)</td>
<td>4.4 (.52)</td>
<td>-3.795**</td>
<td>4 (.61)</td>
<td>-1.250</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. *p < .05, **p < .01.

**Table 8 Mean differences for the factors between CIOs and IT professionals and between CIOs and C-level executives (t-test) (senior manager Sample)**

<table>
<thead>
<tr>
<th></th>
<th>CIO</th>
<th>IT</th>
<th>T-test</th>
<th>C-level</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=</td>
<td>22</td>
<td>21</td>
<td></td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>2.9 (.41)</td>
<td>2.5 (.50)</td>
<td>3.614**</td>
<td>4 (.39)</td>
<td>-10.024**</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>3.9 (.57)</td>
<td>4 (.63)</td>
<td>-7.05</td>
<td>3.5 (.59)</td>
<td>2.353*</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. *p < .05, **p < .01.
As shown in Table 7, students rated IT professionals significantly higher than CIOs on the problem-solving dimension whereas their ratings on the leadership dimension did not differ. Student’s ratings on the leadership dimension for CIOs and IT professionals were also significantly lower than the ratings for C-level executives. When comparing CIOs and C-level executives on the problem solving dimension, no statistical differences were found.

Similar to students, senior managers rated C-level executives significantly higher than CIOs on the leadership dimension. However, senior managers perceived CIOs as significantly higher than C-level executives on the problem-solving dimension. As for the comparison between CIOs and IT professionals, senior managers rated the CIO significantly higher than IT professionals on the leadership domain, but no statistical difference was found on the ratings describing the problem solving dimension.

One-way ANOVAs were conducted to examine differences in senior managers’ responses on leadership and problem-solving scores based on demographic variables such as their organization’s level of IT intensity (e.g., low, medium, high), company size (e.g., small, medium, large), and gender. No statistical differences were found across these demographic variables within each group. Please refer to Appendix D-5 for details.

3.3.1.5 Discussion

The goal of this study was to ascertain the existence and content of a CIO stereotype. The research provides convincing evidence that, not only does a CIO stereotype exist, but it also persists over time. This research explored two other stereotypes: the IT professional stereotype and the C-level executive stereotype. The analysis of all three stereotypes revealed that the CIO stereotype was distinct from the C-level executive but closely aligned with the IT professional stereotype.
When comparing stereotypes of CIOs to IT professionals, the findings reveal that the stereotype content of these two groups share significant overlap and both CIOs and IT professionals are stereotypically characterized as being techy, innovative, detail-oriented, task-focused, and geeks. There was only one minor difference between students’ and senior managers’ rankings of CIOs and IT professionals: senior managers rated CIOs as more innovative than IT professionals, whereas students rated IT professionals higher than CIOs on this trait. This result was also corroborated with the free responses where senior managers stereotypically characterized CIOs as more highly innovative than IT professionals. A plausible explanation for this result is the common association between technology and innovation (e.g., Burgesmani and Wheelwright 2004; Miller and Morris 2008). The closer the professional group is related to technology, the greater the tendency to perceive that group as being more innovative. However, the fact that students find IT professionals to be slightly more innovative than CIOs and senior managers find CIOs slightly more innovative than IT professionals really does not matter. The IT professional stereotype includes innovativeness and the CIO is a subgroup (i.e., sharing widely stereotype content) of the IT professionals group. In sum, the findings provide clear evidence that CIO stereotypes are strongly rooted in the IT stereotype and thus confirm Peppard’s (2010) assertion that one of the challenges that hinder CIOs’ ability to successfully perform in their organization may be overcoming this IT stereotype.

The data also show that CIOs are stereotypically differentiated from C-level executives. The general picture of C-level executives aligns more with the stereotype content of a successful manager/leader (e.g., ambitious, assertive, confident, driven, energetic, dominant, sociable) than with the general picture of CIOs. Although CIOs were perceived as more ambitious, assertive and sociable than IT professionals, the stereotypical traits of CIOs fall far short of those of C-level
executives and do not align with a variety of traits normally used to describe successful managers. The free-responses confirm the distinct characteristics (e.g., decision makers, experienced, leader, powerful, team player, highly paid) that senior managers and students used to describe C-level executives, unlike CIOs. In general, the findings reveal a general perception of CIOs as a subgroup (i.e., similar to, in-group member) of superordinate IT professionals stereotypes and consequently as a subtype (i.e., different from, out-group member) of the C-level executive stereotype.

When exploring the underlying dimensions of the composite traits of the stereotypical profiles, it was interesting that the stereotype content can be interpreted along two dimensions – leadership and problem-solving. The leadership dimension includes general business and interpersonal traits considered requirements for effective leaders (e.g., charismatic, confident, driven, energetic, assertive, dominant, sociable) (Hogan and Kaiser 2005; Howard and Bray 1988). The other dimension encompasses the crucial traits for problem-solving (e.g., detail-oriented, task-focused, innovative, curious). These traits are thought to be required for effective project managers who need to gather information about the problem and use their analytical abilities to get to the root of the problem (Napier et al. 2009). In the leadership dimension, both students and senior managers characterized CIOs as possessing significantly fewer prototypical leadership traits (i.e., 19 out of 23 significant differences between CIOs and C-level executives were found) such as charismatic, leader, ambitious, sociable, driven. Senior managers also rated CIOs as more effective than the C-level group with respect to problem-solving whereas students rated these two groups similarly. The dominant belief that CIOs are perceived to lack the necessary leadership competencies (Karahanna and Watson 2006; Peppard 2010) is supported by these findings.
A plausible explanation for this dominant belief may be the strong association with (i.e., including positive and negative valences) IT events or roles (i.e., event schemas or role schemas). The free-responses analysis reveals that the most accessible attributes when describing CIOs and IT professionals (i.e., CIOs more than IT professionals) are related to IT-related characteristics (e.g., computers, data, information systems). The accessibility of these characteristics shows that the schemas related with IT events (e.g., glitches, slow, not crucial, important, support) and IT role schemas (e.g., techy, nerdy, geek) tend to dominate consideration of other role schemas (e.g., senior managers). The activation of these IT-related schemas may have automatically influenced respondents to categorize CIOs and IT professionals as non-leaders and attribute less positive characteristics to their role (e.g., “behind scenes”, “basement”) due to pre-existing implicit leadership theories.

Implicit leadership theories have been used by researchers to explain leadership attributions and perceptions, distortions in behavioural ratings, and the assimilation of information around leadership labels and prototypes (Lord 1985). Lord and colleagues (1984) propose that leadership is a cognitive category that is hierarchically organized; at the highest hierarchical level (i.e., or superordinate level in Rosch’s terms), leadership is a very inclusive or general construct. That is, leaders are differentiated from non-leaders at this level based on highly abstract prototypes. However, at the intermediate or basic level of categorization, other types of leaders can be distinguished (e.g., military, financial, minority, labour leaders). Based on the categorization theory’s terms and the findings of this study, I believe that the leadership domain (i.e., one of the factors from the factor analysis) resembles the superordinate level of a leader prototype and the problem-solving domain exemplifies a more basic level of leadership differentiation. Therefore, stimuli possessing anti-prototypical attributes (i.e., geek/social inept,
task-focused versus people-focused, less important) would not lead to perceptions of leadership, whereas stimuli possessing prototypical attributes or exhibiting behaviours (i.e., ambitious, assertive, driven, social) would produce perceptions of leadership. That is, CIOs are not perceived to be leaders because of their strong association with anti-prototypical attributes that do not lead to perceptions of leadership, and therefore, may locate CIOs as a subtype in the general category of C-level executives (i.e., leaders).

In sum, this study confirms the dominant belief that CIOs are not perceived as prototypical leaders similar to general C-level executives. One reason for this belief (and persistence of this belief) is rooted in the IT stereotype that spills over onto perceptions of CIOs. CIOs are perceived as good and effective problem-solvers – attributes that are positive but mostly for service provisioning types of tasks and not for strategic tasks. If most CIOs are not considered in-group members of the C-suite (i.e., sharing little prototypical content with other C-suite members), what are the salient characteristics that make CIOs different from other C-level executives? Study 2 was designed to identify these characteristics.

3.3.2 Study Two

3.3.2.1 Sample

The first sample consisted of 252 undergraduate business students (i.e., 24 freshmen, 123 sophomores, 29 juniors, and 76 seniors). Participants were randomly assigned to one of three treatments and asked to rate a senior executive (i.e., either CFO, CIO, or CMO depending on the treatment) on a given list of traits and behaviours. The sample yielded 84 ratings of CFOs, 86 ratings of CIOs, and 82 ratings of CMOs. The second sample consisted of 59 senior managers (i.e., 23 CEOs, 26 senior managers, 10 general managers) from large- and medium-sized Canadian organizations from various industries that were further categorized as high, medium,
and low IT intensity (see Appendix E-1: Table for demographic statistics). As with the student sample, senior managers were randomly assigned to rate a CFO, CIO or CMO (depending on treatment assigned) on a given list of traits and behaviours. This sample yielded 20 ratings of CFOs, 20 ratings of CIOs, and 19 ratings of CMOs.

3.3.2.2 Measures

The study was based on the California Psychological Inventory (CPI) – a well-established list of 152 personality and behavioural traits used for psychological testing (Gough and Heilbrun 1983). Three independent raters – two experts in the IS field plus an expert in psychology and the statistical methodology – scrutinized all 152 items of the CPI to eliminate 1) any items judged to be unrelated to senior executives (e.g., “crying during movies”), and 2) any items considered redundant to the information available in one or more other items (i.e., highly correlated items are likely to be cancelled out in the analysis). Removing items identified by at least two raters reduced the list to 70 items. Each item was rated on a five point Likert scale (-2 strongly disagree, -1 disagree, 0 neutral, +1 agree, +2 strongly agree).

The survey presented an organizational scenario describing a CEO who, over the years of holding weekly meetings with CFOs, CIOs and CMOs, claimed to be able to “enter a boardroom and within 3 minutes identify who was the CFO, the CIO and the CMO”. The respondent was then asked to rank one of these three executives (randomly assigned) on the 70 personality and behavioural items. A brief description of the role of the executive (i.e., CFO, CIO or CMO) was presented. These descriptions were carefully crafted to demonstrate similarity and uniformity with respect to organizational hierarchy – the only difference being their specific roles and areas of expertise. This was important because the CIO and CMO are not always part of the senior
executive team and this preconceived knowledge could have potentially biased the respondents’ perceptions (see Appendix E-2 for instructions and complete list of adjectives).

3.3.2.3 Procedure

To analyze the data using a three-group (i.e., CIOs, CFOs, and CMOs), direct-entry discriminant analysis procedure was used due to its usefulness for classifying cases into groups on the basis of multiple factors. This procedure identifies which items best discriminate between groups (i.e., CFOs, CIOs and CMOs) and analyzes the precision of these items for group classification (Klecka 1980). Discriminant analysis has been used by other researchers for examining “the overlap or independence” of different groups in stereotype content research (Devine and Baker 1991; Schneider and Bos 2011). The key benefit of discriminant analysis is its ability to compare multiple social groups by creating dimensions which allow the identification of crucial differences among stereotyped groups. A discriminant analysis can clarify “which characteristics are associated with each dimension and where each group is located on the dimension” (Devine and Baker 1991, p. 45).

Our dependent variable was senior executive (e.g., CFO, CIO, and CMO). All 70 items were treated as predictors, and the scores calculated for each predictor were the independent variables. Before conducting the discriminant analysis, however, the data was examined to meet the assumptions of this statistical technique (e.g., normality, multicollinearity). I followed (Tabachnick and Fidell 2012) procedure to identify and treat outliers as well as examine multicollinearity. Please refer to Appendix E-3 for details of this procedure in each sample population (e.g., students and senior managers). With the assumptions met, the discriminant analysis was conducted. The procedures and results are discussed below.
3.3.2.4 Results

The 247 cases were randomly split into two subsets – a main sample and a “holdback” sample – by selecting every third case for the holdback sample. Adopting a conservative approach, I excluded all cases with any missing values. The main sample consisting of 153 cases (i.e., 61.9% of the sample) was used to derive the discriminant functions and the holdback sample of 78 cases (i.e., 31.6%) was used only to test the resultant classification accuracy thereby validating the profiles obtained from the main sample. A discriminant analysis based on all 69 items (i.e., personality and behavioural traits) revealed two highly significant discriminant functions (i.e., a combination of items) that best predicted group membership. The predictive accuracy (i.e., correct classification into groups) of the model for the main sample was 93.5% and for the holdback sample (see Table 9 and Table 10).

<table>
<thead>
<tr>
<th>Actual group</th>
<th>No. of cases</th>
<th>Predicted group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CFO</td>
</tr>
<tr>
<td>CFO</td>
<td>51</td>
<td>47 (92.2%)</td>
</tr>
<tr>
<td>CIO</td>
<td>53</td>
<td>3 (5.7%)</td>
</tr>
<tr>
<td>CMO</td>
<td>49</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Percentage of cases correctly classified: 93.5%

<table>
<thead>
<tr>
<th>Actual group</th>
<th>No. of cases</th>
<th>Predicted group membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CFO</td>
</tr>
<tr>
<td>CFO</td>
<td>26</td>
<td>17 (65.4%)</td>
</tr>
<tr>
<td>CIO</td>
<td>27</td>
<td>5 (18.5%)</td>
</tr>
<tr>
<td>CMO</td>
<td>25</td>
<td>1 (4%)</td>
</tr>
</tbody>
</table>

Percentage of cases correctly classified: 70.5%

I then proceeded to identify which of the 69 items best discriminated CFOs, CIOs and CMOs. An item was considered a good discriminator if its structure coefficient exceeded +/-.3
(i.e., an item capable of explaining at least 10% of the remaining variance). Eliminating all items failing this test reduced the set of items from 69 to 18. A new discriminant analysis was then run on the main sample using only these 18 items. The results not only reconfirmed the existence of two significant discriminant functions (see Table 11) but also actually enhanced the overall classification accuracy of the holdback sample due to the reduction of poor discriminating variables\(^{12}\) (see Table 12 and Table 13). This indicates that our sample of business students could accurately differentiate CFOs, CIOs, and CMOs on the basis of the 18 items listed in Table 9. Table 9 also shows how these items align with the two discriminant functions produced by the analysis.

Table 11 Summary of interpretive measures for discriminant loading

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Description (predictors)</th>
<th>Discriminant loading (rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Function 1</td>
</tr>
<tr>
<td>1</td>
<td>CxOs have a vivid imagination</td>
<td>.453</td>
</tr>
<tr>
<td>2</td>
<td>CxOs do things by the book (reverse item)</td>
<td>-.390</td>
</tr>
<tr>
<td>3</td>
<td>CxOs are open to change</td>
<td>.376</td>
</tr>
<tr>
<td>4</td>
<td>CxOs see humor in situations</td>
<td>.341</td>
</tr>
<tr>
<td>5</td>
<td>CxOs put a new perspective on things</td>
<td>.338</td>
</tr>
<tr>
<td>6</td>
<td>CxOs express themselves easily</td>
<td>.312</td>
</tr>
<tr>
<td>7</td>
<td>CxOs are skilled in handling social situations</td>
<td>.301</td>
</tr>
<tr>
<td>8</td>
<td>CxOs understand people who think differently</td>
<td>.289</td>
</tr>
<tr>
<td>9</td>
<td>CxOs can see different points of view</td>
<td>.287</td>
</tr>
<tr>
<td>10</td>
<td>CxOs act comfortably with others</td>
<td>.271</td>
</tr>
<tr>
<td>11</td>
<td>CxOs are effective communicators</td>
<td>.262</td>
</tr>
<tr>
<td>12</td>
<td>CxOs don’t talk a lot (reverse item)</td>
<td>-.256</td>
</tr>
<tr>
<td>13</td>
<td>CxOs keep in the background (reverse item)</td>
<td>.334</td>
</tr>
<tr>
<td>14</td>
<td>CxOs lay down the law to others</td>
<td>-.285</td>
</tr>
<tr>
<td>15</td>
<td>CxOs try to outdo others</td>
<td>-.274</td>
</tr>
<tr>
<td>16</td>
<td>CxOs automatically take charge</td>
<td>-.269</td>
</tr>
<tr>
<td>17</td>
<td>CxOs believe that they are important</td>
<td>-.268</td>
</tr>
<tr>
<td>18</td>
<td>CxOs put people under pressure</td>
<td>-.265</td>
</tr>
</tbody>
</table>

\(^{12}\) Poor discriminating variables (also known as redundant variables) refer to those variables that do not contribute to the analysis; that is their unique contributions are insufficient. For instance, the presence of two or more variables whose group means are similar yields poor discrimination (Klecka 1980).
Table 12 Classification results for main sample (n = 162) based on 18 traits

<table>
<thead>
<tr>
<th>Actual group</th>
<th>No. of cases</th>
<th>Predicted group</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CFO</td>
<td>CIO</td>
<td>CMO</td>
</tr>
<tr>
<td>CFO</td>
<td>53</td>
<td>48 (90.6%)</td>
<td>3 (5.7%)</td>
<td>2 (3.8%)</td>
</tr>
<tr>
<td>CIO</td>
<td>56</td>
<td>7 (12.5%)</td>
<td>46 (82.1%)</td>
<td>3 (5.4%)</td>
</tr>
<tr>
<td>CMO</td>
<td>53</td>
<td>1 (1.9%)</td>
<td>4 (7.5%)</td>
<td>48 (90.6%)</td>
</tr>
</tbody>
</table>

Percentage of cases correctly classified: 87.7%

Table 13 Classification results for holdback sample (n = 80) based on 18 traits

<table>
<thead>
<tr>
<th>Actual group</th>
<th>No. of cases</th>
<th>Predicted group</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CFO</td>
<td>CIO</td>
<td>CMO</td>
</tr>
<tr>
<td>CFO</td>
<td>26</td>
<td>20 (76.9%)</td>
<td>5 (5.7%)</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>CIO</td>
<td>28</td>
<td>2 (7.1%)</td>
<td>23 (82.1%)</td>
<td>3 (10.7%)</td>
</tr>
<tr>
<td>CMO</td>
<td>26</td>
<td>0 (0%)</td>
<td>2 (7.7%)</td>
<td>24 (92.3%)</td>
</tr>
</tbody>
</table>

Percentage of cases correctly classified: 83.8%

The items loading on Function 1 were grouped into three different aspects of personality: openness, sociability and communication. Collectively, these traits represent valuable leadership skills. In contrast, the items loading on Function 2 reflect two behavioural constructs – assertiveness and dominance – that stand in stark contrast to the traits of Function 1. The collective traits of Function 2 reflect a proclivity toward competitive action or directive leadership\(^\text{13}\) (Eagly and Johannesen-Schmidt 2001). Whereas Function 1 highlights abilities such as “seeing different points of view” and “being open to change”, Function 2 traits consist of “laying down the law to others” and “automatically taking charge”. It is interesting to note in Table 3 that one item (“having a vivid imagination”) loads on both functions – positively on Function 1 and negatively on Function 2. Having a vivid imagination is directly related to creativity, openness, sociability and communication but indirectly related to assertiveness and dominance.

\(^{13}\) A meta-analysis of the relationship between personality traits and leadership perceptions report that aggressive, decisive, determined, directive traits have been associated with a more autocratic and male leadership styles (Lord et al. 1986)
Figure 1 is a scatterplot of all 252 cases in the main sample showing the group centroids for CFOs, CIOs and CMOs. The axes are expressed in standard deviations. On the y-axis representing discriminant Function 1, the three centroids are well separated. On this Function, the position of the CFO centroid was lower than CIOs (by 2 standard deviations) and CMOs (by almost 4 standard deviations). On the x-axis representing discriminant Function 2, the CFO and CMO centroids are in close proximity with a positive ranking (i.e., slightly above the overall average). In sharp contrast, the CIO centroid is almost 2 standard deviations below those of CFOs and CMOs suggesting that students feel CIOs lack assertiveness and tend not to dominate others relative to CFOs and CMOs. Table 12 compares the grouping of items and means on each of the key concepts that collectively constitute Function 1 and 2 between the CIO group and CFO and CMO groups respectively.

![Figure 1 Discriminant analysis using 18 variables (student sample)](image-url)
Table 14 Constructs and item means by group for student sample

<table>
<thead>
<tr>
<th>Function</th>
<th>Construct</th>
<th>Items/Variables</th>
<th>CIO</th>
<th>CFO</th>
<th>CMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Openness</td>
<td>CxOs have a vivid imagination</td>
<td>3.3</td>
<td>2.3</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs put a new perspective on things</td>
<td>3.7</td>
<td>3.0</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs are open to change</td>
<td>3.5</td>
<td>2.7</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs understand people who think differently</td>
<td>3.4</td>
<td>3.0</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs can see different points of view</td>
<td>3.5</td>
<td>3.3</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs do things by the book (reverse item)</td>
<td>2.6</td>
<td>3.3</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>Sociability</td>
<td>CxOs see humor in situations</td>
<td>2.7</td>
<td>2.4</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs are skilled in handling social situations</td>
<td>3.0</td>
<td>3.3</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs act comfortably with others</td>
<td>3.5</td>
<td>3.7</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>Communication</td>
<td>CxOs express themselves easily</td>
<td>3.2</td>
<td>3.3</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs are effective communicators</td>
<td>3.4</td>
<td>3.7</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs don’t talk a lot (reverse item)</td>
<td>2.9</td>
<td>3.4</td>
<td>4.2</td>
</tr>
<tr>
<td>2</td>
<td>Assertiveness</td>
<td>CxOs keep in the background (reverse item)</td>
<td>2.4</td>
<td>3.6</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs automatically take charge</td>
<td>2.9</td>
<td>3.6</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs believe that they are important</td>
<td>4.0</td>
<td>4.6</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Dominance</td>
<td>CxOs lay down the law to others</td>
<td>3.2</td>
<td>4.1</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs try to outdo others</td>
<td>3.0</td>
<td>3.7</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CxOs put people under pressure</td>
<td>3.4</td>
<td>4.2</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Students were also asked to report in a Likert scale their familiarity with the respective role assigned to the treatment (i.e., “I am very familiar with the role of CFOs) with the results showing that 64% of the respondents were familiar with the CFO role, following by 53% and 47% of familiarity with the role of CMO and CIO respectively.

In order to test the validity and stability of these profiles beyond the student population, the 18-item profile scale was further validated with a group of senior managers with 10+ years of work experience. After examining the assumption of normality, I then conducted the re-classification analysis using the discriminant functions derived from the main sample of the undergraduate student sample. The predictive accuracy (i.e., correct classification into groups) of the senior manager sample with respect to the undergraduate sample was 71.6% (see Table 15 Classification results for senior manager sample (n = 59) based on 18 traits).
Table 15 Classification results for senior manager sample (n = 59) based on 18 traits

<table>
<thead>
<tr>
<th>Actual group</th>
<th>No. of cases</th>
<th>Predicted group</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CFO</td>
<td>CIO</td>
<td>CMO</td>
<td></td>
</tr>
<tr>
<td>CFO</td>
<td>20</td>
<td>12 (60%)</td>
<td>8 (40%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>CIO</td>
<td>20</td>
<td>7 (35%)</td>
<td>12 (60%)</td>
<td>1 (5%)</td>
<td></td>
</tr>
<tr>
<td>CMO</td>
<td>19</td>
<td>0 (0%)</td>
<td>1 (5%)</td>
<td>18 (95%)</td>
<td></td>
</tr>
</tbody>
</table>

Percentage of cases correctly classified: 71.6%

The percentage of cases correctly classified was 71.6%, a percentage slightly lower than 87.7% from the undergraduate student sample (i.e., 66.7%), but still considered significantly higher than chance (i.e., 33% of classification would be due to chance). Most classification errors occur between CFOs and CIOs. The CFO was incorrectly profiled as the CIO in 8 cases and CIOs were incorrectly profiled as CFOs in 7 cases for a total of 15 misclassifications out of 59 cases. The CMO profile was consistently accurately classified. The scatterplot in Figure 2 shows this overlap and the group centroids.

Figure 2 Discriminant analysis using 18 variables (senior manager sample)
Despite minor misclassifications, the centroids of the groups were located along the two axes almost identically to undergraduate student sample. CFOs are perceived as somewhat less creative, open, sociable and effective communicators than CIOs (a difference of less than 2 standard deviations) and less than CMOs (by almost 4 standard deviations). In contrast, the strongly positive and well-defined CMO centroid indicates that CMOs are profiled as being highly creative, open, sociable and good communicators. In regard to Function 2, the location of the CIO centroid (i.e., below the center and almost 2 standard deviations below those of CFOs and CMOs) suggest that senior managers also perceive CIOs as being less assertive and dominant than CFOs and CMOs.

With respect to the respondents’ self-perception of their familiarity with the role assigned (e.g., “I am very familiar with the role of CFOs), the results showed that 80 of the respondents assigned the CFO treatment were familiar with the role, following by 53% and 50% of familiarity with the role of CMO and CIO respectively. No significant differences on the constructs formed by the 18 items were found with respect to type of IT industry and firm size within each group (please refer to Appendix E-4 for details).

What is clear from these results is that there are very definite stereotype profiles for each of these three organizational roles. In addition, the results show that these profiles can be differentiated on the basis of five general concepts – openness, sociability, communication, assertiveness and dominance, graphically represented in Figures 3 and 4.
Figure 3 Across-group means comparisons on social dimension (Function 1)

Figure 4 Across-group means comparisons on “taking charge” dimension (Function 2)
3.3.2.5 Discussion

The key aspect of the previous Figures is the relative gaps between CFOs, CIOs and CMOs on the six key dimensions as opposed to their actual rankings/scores. That is, it is less important to know that CIOs are viewed as being open to change than it is to know that CIOs are viewed to be much less open to change than CMOs but slightly more open than CFOs. Looking at Figure 3, the proximity of both CIOs and CFOs to a score of 3.0 on sociability indicates that the participants’ response to the statement CIOs (or CFOs) are “open to change” was neutral (i.e., they neither agreed nor disagreed). It was the significant gap between CMOs and both CFOs and CIOs on this dimension that was the differentiating factor. The results revealed that the two organizational roles that stand in stark contrast are the CFO and CMO. The CIO is perceived somehow in between these two roles on the constructs forming Function 1 (i.e., social leadership dimension), but perceived the least in assertiveness and dominance (i.e., “taking charge”).

CIO Stereotype Profile – relative to CFOs

The perceived stereotype profiles for CIOs differ significantly from the profile of CFOs on the openness, assertiveness, and dominance constructs. CIOs were rated higher on the openness construct, revealing that CIOs were perceived as significantly “having a more vivid imagination” and “understand people who think differently” more than CFOs, but lower when it comes on “doing things by the book”. However, CIOs were rated lower than CFOs on the assertiveness and dominance constructs. CIOs were perceived as significantly less assertive and dominant than CFOs. Specifically, CIOs were rated significantly lower on three items: “automatically take charge”, “put people under pressure” and “lay down the low to others”. In addition, no significant differences were found between CIOs and CFOs on the sociability and communication constructs. However, these executives were rated lower in these constructs in comparison to CMOs.
CIO Stereotype Profile – relative to CMOs

On average, students and senior managers perceived significant differences between CIOs and CMOs on the openness, sociability, communication, and assertiveness constructs. Specifically, CIOs were perceived as less likely to “put a new perspective on things”, less likely to “understand people who think differently”, and less capable to “see different points of view”. Although higher than CFOs, CIOs were perceived as being slightly less “open to change” and having lower imagination than CMOs. In terms of sociability and communication, CIOs were viewed as possessing lower social and communication skills than CMOs. CIOs were also perceived less assertive than CMOs; the item that accentuated this difference was “automatically take charge”. In dominance, CIOs and CMOs were perceived similarly.

If we think of Function 1 as “social leadership” and Function 2 as “taking charge”, it sheds new light on some of the observations of other researchers. CIOs have been described as “last among equals” referring to the fact that they are perceived to be the junior (if not the weakest) member of the senior management team. This “weakness” may arise from a stereotypical perception of CIOs as being non-assertive and possessing low communication skills. Furthermore, this may be part of a vicious circle where senior managers, who share this CIO stereotype, behave in ways that reinforce their stereotypical views. That is, the lack of opportunities available to CIOs may deny them the ability to seize such initiatives more frequently and aggressively. As Peppard et al (2011) state … “possessing leadership competencies is only one side of the equation”. The question facing CIOs with respect to the C-suite is “Do I wait to be invited to the party or do I crash it?” Both alternatives denote weakness and exude a lack of self-confidence. The dilemma for CIOs is that, despite the perception of adequate social leadership skills (i.e., Function 1), without opportunity to take initiative, they are ineffectual relative to other senior managers due to their lack of “taking charge” (Function 2).
In sum, while study 1 examined the content of the CIO stereotype, eluding that it was rooted in the IT stereotype and different from the general C-level executive stereotype, this study specifically measured and contrasted CIOs, CFOs and CMOs. What is clear from our results is that there are very definite stereotypes of each of these three organizational roles. Perhaps the two most surprising findings were that 1) students and senior managers differentiated these organizational roles on the basis of only five general concepts – openness, sociability, communication, assertiveness and dominance – that highlights two important dimensions in leadership (i.e., social and dominance), and 2) the stereotypical profiles of these organizational roles (e.g., CIOs, CFOs, CMOs, C-level executives, and IT professionals) remain constant across the two samples, students and senior managers, suggesting that these stereotypes are persistent and stable over time.
Chapter 4

An Assessment of Fit Between the CIO Stereotype and Corporate Strategic Roles

4.1 Introduction

Given that a CIO stereotype exists and is widely shared among senior managers (Studies 1 and 2), the next question is how (or if) it impacts the role of the CIO. In this Chapter, I describe two studies that explore the effects of these stereotypical beliefs on decisions concerning the promotion (Study 3) and performance evaluation (Study 4) of CIOs within an organization context.

Although some CIOs are increasingly gaining access to the “C-suite” and playing a more strategic role in the organization, many continue to struggle to establish credibility as business leaders (Heller 2013; Kaarst-Brown 2008; Peppard 2010). Such studies suggest that CIOs have “voices” that go unheard despite occupying a seat at the senior management table. Despite the fact that IT has become critical for organizations and considered a key strategic component for competitive performance (e.g., promoting IT as an agent of business change, redesigning firm strategy, and ultimately creating business value) (Banker et al. 2011; Karahanna and Watson 2006), the presence and influence of CIOs on corporate boards and their selection to lead strategic initiatives remains infrequent. Recent data reveals that less than 10% of CIOs have been assigned board duties (IBM 2009) and only 20% are viewed as business strategists (CIO Magazine 2013). Most CIOs are still seen as service providers. One possible explanation is the existence of broadly-based stereotypes that have entrapped CIOs in a self-fulfilling prophecy that casts them in tactical and operational roles and denies them opportunities to become strategic partners within
the organization. I propose that these strong and reinforcing beliefs result in CIOs being seen as counter-stereotypical for strategic roles.

Numerous studies have documented the way in which counter-stereotypical individuals (i.e., usually minorities) face discrimination when seeking jobs that are thought to be incongruent for them (Eagly and Johannesen-Schmidt 2001; Eagly and Karau 2002; Glick et al. 1988; Heilman 2001). The central premise of these studies is explained as follows: “When a stereotyped group member and an incongruent social role become joined in the mind of the perceiver, this inconsistency lowers the evaluation of the group member as an actual or potential occupant of the role” (Eagly and Karau 2002, p. 574). Underrepresentation of minorities (e.g., women, ethnic groups) in higher ranks is a classic example of this prejudice (i.e., commonly interpreted as the “glass-ceiling”). Despite the presence of equality or near equality to majorities (e.g., men, white managers) on many indicators (e.g., education, past experience), minorities have been discriminated against when considered for leadership positions historically occupied by majorities (Eagly and Johannesen-Schmidt 2001). The common perception is that minorities have less leadership ability to attain and achieve success in high-level leadership positions (Eagly and Johannesen-Schmidt 2001). Much of this perception derives from strong association between the stereotypical beliefs and expectations attributed to minorities in comparison to the majorities and the traditional roles attributed to these groups respectively.

In addition to impeding their rise to senior leadership ranks (i.e., hitting the “glass ceiling”), minorities often find themselves poised on a “glass cliff” (Ryan and Haslam 2007). The “glass cliff” attempts to extend the concept of “glass ceiling” by explaining the potential discrimination and bias against minorities once they have reached top leadership roles. Although research is at an early stage, studies have already demonstrated two forms of prejudice under this
concept: minorities are more likely than majorities to be promoted in weakly performing organizations, and minorities tend to receive more negative attributions to their performance and competence after a failure (Brescoll et al. 2010; Carton and Rosette 2011; Haslam 2008; Murphy and Cleveland 1995).

One of the reasons for the persistence of these subtle barriers is due to the descriptive, prescriptive, and thus reinforcing, power of stereotypes. Stereotypes are more than beliefs about the attributes of others; stereotypes are consensual expectations about what members of a group actually (or ideally) do, and as expectations they can also dictate and shape behaviours of others (Bielby 2000; Wheeler and Petty 2001). Hall and Carter (1999) showed that, as behaviours become more differentiated between two groups (e.g., sex differentiation) in actuality, people start judging them as increasingly appropriate for only one group. As a result, people tend to think that the differentiation should occur, especially in those behaviours that are associated with larger differentiation. For example, if the larger differentiation between CIOs and other C-level executives occurs in their leadership orientation (i.e., CIOs considered task-oriented and specialists while other C-level executives are considered people-oriented and generalists), people will tend to think that this differentiation is in fact expected and sometimes desired.

Considering the stereotypical beliefs ascribed to CIOs and the historical supportive organizational role assumed by CIOs, I believe that CIOs suffer from a perceived lack-of-fit (i.e., job incongruence) in the context of corporate strategic leadership roles. Furthermore, I propose that there is a better fit between the perceived skills and competence of CIOs for tactical and operational roles than there is for strategic roles due to the existence of stereotypes ascribed to CIOs and to these respective organizational roles. The perceived inconsistency between the stereotypical beliefs associated with CIOs and the stereotypical beliefs perceived to be required to
succeed in strategic positions can potentially cause bias and prejudice against CIOs, thereby denying them the opportunities to occupy these roles (e.g., “glass-ceiling”), and even more, negatively influencing their performance once they are given these roles (e.g., “glass-cliff”).

I explore these assertions in two experimental-survey studies that test whether CIOs suffer disadvantage relative to other C-level executives on promotion allocations (i.e., to strategic roles) and performance evaluations (i.e., in strategic roles). By testing mechanisms related to the promotion of CIOs from tactical and operational roles to more strategic roles in organizations, this analysis advances our understanding of the potential barriers that, not only prevent CIOs for becoming strategic partners to the organization, but also undermine their performance.

In the next section, I present a literature review and theoretical reasoning to support the assertions of both studies. I then outline details of the experimental designs and results. Discussions are presented at the end of each study.

4.2 Literature Review and Conceptual Development

4.2.1 Are CIOs denied strategic initiatives?

In addition to the stereotype-fit models explained earlier, Eagly and Karau (2002) propose a role congruity theory to explain possible prejudice against minorities in management, in particular prejudice against female leaders. Role congruity theory is derived from social role theory which aims to explain the treatment of the content of gender roles and their importance in promoting sex differences in behaviour (Eagly et al. 2000). Role congruity theory, however, goes beyond social role theory to consider gender roles and other roles, specifically leadership roles. Eagly and Karau (2002) argue that the perception of incongruity between leadership roles and the female gender role often results in prejudice toward female leaders. The incongruity (i.e., lack-of-
fit) occurs because social perceivers typically develop leadership roles in agentic terms (e.g., competitive, objective, aggressive, ambitious) whereas they expect and prefer women who exhibit communal characteristics (e.g., affectionate, helpful, kind, sensitive). However, the degree of congruity between a leader role and the female role would depend on many factors, including the prototype of the leader, the weight given to the female gender role, and the personal approval of traditional definitions of gender roles. Hence, congruity theory suggests that prejudice toward female leaders is due to the incongruity that many people perceive between the characteristics of women and the requirements of leader roles.

I believe that lack-of-fit or job-incongruence can explain the underrepresentation of CIOs in strategic roles in organizations. I propose that perceivers ascribe a better fit between the skills and competences of CIOs and tactical and operational roles than for corporate strategic roles, and that these beliefs are a consequence of the stereotypes associated with these organizational roles. These roles act as socially or organizationally shared expectations that apply to individuals who occupy a certain social position or are a member of a particular social category (Biddle 1979; Sarbin and Allen 1968).

According to social role theory, “perceivers infer that there is correspondence between the types of actions people engage in and their inner dispositions” (Eagly and Karau 2002, p. 574). Thus, a social role or occupational role is grounded in the perceivers’ correspondent

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14 Social role theory proposes that the majority of beliefs that differentiate women from men pertain to communal and agentic attributes (Bakan 1966; Eagly 1987). “Communal characteristics, which are ascribed more strongly to women, describe primarily a concern with the welfare of other people—for example, affectionate, helpful, kind, sympathetic, interpersonally sensitive, nurturant, and gentle. In contrast, agentic characteristics, which are ascribed more strongly to men, describe primarily an assertive, controlling, and confident tendency—for example, aggressive, ambitious, dominant, forceful, independent, self-sufficient, self-confident, and prone to act as a leader (Eagly and Karau 2002, p. 574). Although there are other characteristics that differentiate women and men, Eagly and Karau (2002) claim that it is the communal and agentic characteristics that shed light into issues of prejudice in leadership domains.
inferences from the activities that an incumbent (or candidate) commonly perform in their typical social or occupational role to the personal qualities that are apparently required to undertake these activities (Eagly 1987; Eagly et al. 2000). Job stereotypes thus follow from the observations of people in job-typical professions. For instance, across business organizations, corporate strategic leadership positions (e.g., CEO) have traditionally been occupied by senior managers whose functional backgrounds are from finance and marketing. According to a Forbes study, most CEOs (i.e., about 30 percent of Fortune 500 CEOs) have a background in finance and their second most frequent background is sales and marketing (20 percent of Fortune 500 CEOs) (Savitz 2011). Senior managers with a finance background are considered to be the best equipped to run corporations due to the firm’s main dependency on, access to, and control of capital (Zorn 2004). Hence, high levels of organizational authority, responsibility, and status have typically been associated with finance and marketing. Interestingly, exact percentages of CEOs having IT backgrounds was not found which, in and of itself, likely indicates that CIOs’ occupancy of CEO positions and strategic positions still remains lower than other C-level executives. For example, in comparison to other senior executives, less than 10% of CIOs have been assigned board duties (CIO-IIMB study 2013) and only 20% of CIOs are viewed as business strategists in their organizations (CIO magazine 2013). This is also complemented by the fact that CIOs have traditionally occupied more operational and tactical roles in organizations (i.e., a more technology-centric role than business-centric role). Therefore, a corporate strategic leader image would most easily/likely be associated with senior executives whose functional backgrounds are from finance or marketing.

Furthermore, the still prevalent ambiguity concerning the role of the CIO may cast doubt on the competence of CIOs as strategic leaders. While some CIOs are responsible for
seeking IT supply synergies across the corporation and assisting with defining corporate strategy to create business value (i.e., a highly strategic role), most other CIO’s primary responsibility is aligning the IT investment portfolio with the business unit’s strategy (i.e., a tactical role) (Peppard et al 2011).

Different skills and competencies for corporate strategic versus tactical roles have also been documented in the literature. Corporate strategic leadership roles require incumbents to have the competence to formulate a vision, set and achieve organizational goals (Kirkpatrick and Locke 1991), and, in summary, to possess managerial wisdom (i.e., ability to perceive change in the environment as well as an understanding of the social actors and their relationships) (Boal and Hooijberg 2001). According to Kirkpatrick and Locke (1991), successful strategic leaders should have the following traits: drive (i.e., motivation, ambition, energy, perseverance and initiative), leadership motivation (i.e., desire to lead), self-confidence, cognitive ability (i.e., intelligence), and knowledge of the business.

Tactical or operational roles are tasks and activities that support the business strategy – not define it (Anderson et al. 1989). The IT function has traditionally been considered a support activity in organizations (Carr 2003; Cramm 2010; Overby 2005) and, similar to other areas in operations (e.g., manufacturing and human resources), often less understood and underutilized than functions that directly contribute to corporate strategy. Although the IT function lends competitive strength to the business, a different and unique set of skills and competencies are required for executives leading this function (e.g., IT leaders, engineers). Based on a survey of IT managers and general managers in the UK, Willcoxson and Chatham (2006) found differences in their overall leadership style. Some of the differences were: whereas IT managers tend to have a task focus, provide structure, give instructions, adhere to final decisions and gain legitimacy
through task skill and proficiency, general managers tend to focus on people, encourage and support others, serve and nurture, and gain legitimacy through personal commitment and loyalty. Hence, tactical roles seem to require a manager that is task-focused and skilful in identifying deficiencies in business processes.

Because the stereotypical images created for corporate strategic roles (e.g., prototype of general managers, managers with finance and marketing background) do not fit the stereotypical profile of CIOs, corporate strategic roles will be perceived as a poor-fit for CIOs. The results from Studies 1 and 2 found that there are well-defined stereotype profiles for CIOs and C-level executives that are distinct on two dimensions – leadership and problem solving. These results suggest that CIOs are strongly perceived as lacking leadership skills in comparison to general C-level executives. Specifically, CIOs are perceived as less assertive and dominant than other C-level executives (e.g., CMOs and CFOs). However, in the problem-solving domain that refers to traits describing a more task-oriented leader (e.g., task-focused, detail-oriented, curious), CIOs were rated higher than general C-level executives. Therefore, the characteristics required for operational and tactical roles seem to align more with the stereotypical attributes ascribed to CIOs, thereby making CIOs a better-fit for these roles.

In summary, the perception of incongruity between corporate strategic leadership roles and the CIO role is likely to prejudice judgments against CIOs and ultimately deny them strategic opportunities. In contrast, the perception of congruity between tactical roles and the CIO role is likely to favour CIOs for tactical assignments. Should this be the case, the result would be a self-reinforcing situation where perceptual bias casts CIOs in tactical roles, thus preventing them the opportunity to gain experience in more strategic roles and ultimately denying them recognition as strategic leaders.
When rating the suitability of an executive to lead a corporate strategic role or a tactical role, perceivers’ assessments will focus on the match between the general stereotypes of the role and the functional label of senior executives. I propose that when respondents are given the task to choose (and rate the suitability of) a senior executive to lead a corporate strategic role, the CIO will be their last choice (i.e., less suitable) in comparison to CFOs and CMOs. But, when they are asked to choose a senior executive to lead a more tactical role, then the CIO will be more preferable than either CFOs or CMOs. The following hypotheses are offered:

*Hypothesis 3a:* CIOs will be evaluated less favorably than either CMOs or CFOs for corporate strategic roles.

*Hypothesis 3b:* CIOs will be evaluated more favorably than either CMOs or CFOs for operational/tactical roles.

### 4.2.2 How easily can CIOs lose their hard-won corporate strategic roles?

In addition to promotion and hiring decisions, the stereotype-fit models (e.g., Heilam 1983, Dipboye 1985) and the role congruity theory (Eagly and Karau 2002) explain prejudice in performance appraisals. These theoretical perspectives have been used to explain the occurrence of gender bias against the performance of minorities in managerial roles, especially women and African Americans. The stereotypical beliefs of these minorities give rise to expectations that minorities will perform poorly in jobs traditionally attributed to majorities, and the greater the perceived lack of fit (i.e., possessing more or stronger anti-stereotypical characteristics), the more negative the expectations are (Carton and Rosette 2011; Chung-Herrera and Lankau 2005; Heilman 1983, 2001; Lyness and Heilman 2006). In the case of women, the perceived anti-stereotypical traits are kind, caring, and relationship-oriented whereas the stereotypical traits attributed to men are aggressive, tough, and achievement-oriented. In the case of African Americans
Americans, the perceived anti-stereotypical traits include lazy, unintelligent, violence-prone\textsuperscript{15}, and lacking discipline.

Furthermore, the stereotype-fit theories emphasize that these expectations play an important role in evaluative processes because there is a tendency to perpetuate and confirm them. For example, information gets filtered through these expectations, dictating what behaviour is attended to, how that behaviour is interpreted, and whether it is remembered when critical decisions are made (Lyness and Heilman 2006). As a result, the negative expectations of poor-fit perceptions can detrimentally affect minorities (e.g., women) and how their work is evaluated when they are in jobs traditionally occupied by dominant groups (e.g., men). Prejudice against minorities’ performance in leadership positions has prevented them from rising to top leadership roles (e.g., “glass ceiling”) and sometimes diminished their performance once they do reach these roles (e.g., “glass cliff”).

Minorities who have broken the glass ceiling and been assigned strategic leadership roles may be differentially exposed to criticism and in greater danger of being apportioned blame for negative outcomes. For instance, Judge (2003) states that the appointment of women to boards in the UK has “wreaked havoc on companies’ performance” (p. 21). A similar and more recent situation occurred to Mary T. Barra, the first female CEO of General Motors, who four months after being promoted to CEO, was harshly scrutinized for the poor performance allegations of GM cars (i.e., cars’ ignition problems that were thought to be the cause of thirteen deaths) (Trop 2014). In an interview and as a means of explaining Mary’s situation, Haslam (e.g., Haslam 2008; Ryan and Haslam 2007), one of the founders of the “glass cliff” concept, said: “one reason why

\footnotesize\textsuperscript{15} Violence-prone has a different connotation from the trait ‘aggressiveness’ that is often applied to successful managers. Aggressiveness is related to ‘goal-orientedness’, ‘desire of achievement’ or ‘ambitious’.
women get given precarious leadership positions is that they do not have access to the high-quality information and support that might warn them off” (Trop 2014, p. 1). Although empirical support for the “glass cliff” effect is still at an early stage, case studies and anecdotal evidence underscore its presence.

An additional potential mechanism to explain “glass cliff” effects is that making small mistakes on the job is particularly damaging to individuals in stereotype-incongruent roles (Brescoll et al. 2010). Brescoll and colleagues (2010) suggest that when a member of a minority has achieved a high-status position in an incongruent role, making a mistake can be detrimental to performance evaluations. This mechanism is consistent with the romance-of-leadership theory on the assumption that minority leaders (e.g., blacks) tend to receive more negative attributions to their performance and competence after a failure (Carton and Rosette 2011).

CIOs may also face the “glass cliff” effect and negative attribution in failure situations when in incongruent-stereotype roles (e.g., corporate strategic leadership roles). As mentioned earlier, the dominant belief is that CIOs lack leadership competence (e.g., socially inept, limited knowledge of the business). Consequently, responsibility for an organization’s inability to successfully leverage its business with IT is typically borne exclusively by the CIO (Peppard 2010). When IT projects fail, the CIOs are often blamed for the failure. In examining the performance history of the IT function in Texaco, Hirschheim and colleagues (2003) found that over the course of 20 years, IT leaders constantly faced negative allegations of delivering poor performance (i.e., “inferior service quality”) even when contrary factual evidence was reported. Their study also documented the demotion of the IT leader from being a top manager to having to report to the top management in the organization. Similar claims are also found in the practitioner literature. In a 2012 CIO.com article, commenting on why CIOs don't last as long as
other C-level executives, CIO Peter Weis, who has been at the helm of IT for nine years at Matson Navigation, a transportation and logistics firm, said that, "There are always a lot of headwinds for CIOs to try to get through. CIOs can do outstanding work yet still catch the blame when business models sour, strategy shifts or top management changes." (Johnson 2012). Despite countless efforts by CIOs to demonstrate IT value, there seems to be a tendency to underestimate their performance and sometimes to disproportionately blame them for failures.

The activation and application of stereotypes when evaluating CIOs’ performance may also be influenced by the ambiguous and uncertain nature of IT-business initiatives. These initiatives are typically influenced by a multitude of factors (e.g., project management, risk management, technical planning and testing, process change, people skills, motivation), and as such, they are often perceived to be complex and sometimes difficult to comprehend and manage for those not closely involved (e.g., the business side) (Segars and Chatterjee 2010). Ambiguous and difficult-to-comprehend situations prompt perceivers to use stereotypes as a cognitive reducing strategy. In explaining bias against black leaders’ performance failures, Kunda and Spencer (2003) suggest that perceivers tend to activate and apply stereotypes of blacks leaders - and not of white leaders - when evaluating their performance in failure situations. They assert that perceivers do not typically use stereotypes to evaluate white leaders’ performance because there is a clearer match between the leadership competence of whites and the leadership role. Hence, I suggest that senior managers are apt to apply stereotypes of leadership incompetence to CIOs in instances of performance failure in incongruent-stereotype roles, but these stereotypes will be inhibited in other instances (e.g., no performance outcome or performance success). In contrast, stereotypes of leadership incompetence will not be applied to executives in congruent-stereotype roles. I then predict that, for a CIO leading a strategic organizational initiative (e.g., stereotype
incongruence), making a mistake will prove especially damaging to his or her status. For a job-incongruent leader, salient mistakes create ambiguity and call the leader’s competence and knowledge into question, which, in turn, leads to unfavourable performance evaluations. The following hypothesis is offered:

**Hypothesis 4:**
In a strategic role, a CIO’s performance will be judged more harshly than a business counterpart (e.g., a CMO) and these judgments will be moderated by the presence of mistakes. Specifically, CIOs will be judged more harshly than CMOs in the presence of mistakes than in situations of no mistakes.

### 4.3 Studies 3 and 4: Experimental Design and Results

The general purpose of Studies 3 and 4 was to explore the implications of the present CIO stereotype in two organizational contexts: promotion and performance evaluations. Study 3 examined the potential causal mechanisms of these stereotypes, which in this case was the potential prejudice against selecting CIOs to lead a corporate strategic initiative. Studies 1 and 2 demonstrated that CIO stereotypes are rooted in the IT stereotype, and thus CIOs are generally perceived as lacking leadership skills (i.e., less assertive and dominant) and as more competent in problem-solving domains (i.e., task-focused, detail-oriented) than a general C-level executive. These results also suggested that CIOs, similar to IT professionals, are stereotyped as geeks lacking social graces. Therefore, the specific purpose of Study 3 was to test whether these stereotypical beliefs, not only deny CIOs the chance to engage in strategic roles, but also relegates them to tactical/operational roles. I tested the prediction that CIOs would be evaluated less favourably than CMOs and CFOs for strategic opportunities due to stereotype incongruence (H3a), but evaluated more favourably than CMOs and CFOs for tactical opportunities due to stereotype congruence (H3b).
The purpose of Study 4 was to examine the influence of stereotypes on performance evaluations of CIOs (relative to another C-level executive – the CMO) when leading a strategic initiative. Specifically, I tested the general prediction that making mistakes on the job is particularly damaging to individuals in stereotype-incongruent occupations. Applying this prediction to CIOs, I predicted that CIOs would be evaluated more harshly than a business counterpart (e.g., CMO) when making a mistake in an incongruent position (i.e., strategic role) (H4). Similar to Studies 1 and 2, both business students and senior managers were respondents for Study 3. Only business students were used as respondents for Study 4.

This survey-experimental method of examining potential bias against a stereotyped group is referred to as the Goldberg paradigm in honour of P. Goldberg (1968) who created the first experiment in which identical articles presumably written by a women or a man were given to students for evaluation. The experimental control used in those studies bypassed the ambiguities inherent in attempting to statistically control the attributes of the women and men who were compared. These unobtrusive methods are now widely used to study discrimination in hiring and promotion, because the assurances of the experimental method – manipulation of the independent variable and random assignment of respondents to the resulting conditions – allow a causal argument about the effects of the independent variable (e.g., sex, ethnicity, occupation, and role) of the potential target of prejudice. Moreover, there is some evidence that studies using hypothetical scenarios can effectively model the process that occurs in real settings in decisions concerning the target in question (Cleveland 1991; Eagly and Karau 2002), in this case the CIO.

In the next section, I discuss each of these studies in detail and discussions will follow the results.
4.3.1 Study 3

4.3.1.1 Method

The first sample consisted of 103 undergraduate business students (60% female). As previously explained, the students were recruited through the faculty research pool and randomly assigned to groups of thirty people in a classroom. The second sample consisted of 63 senior managers from large- and medium-sized Canadian organizations from various industries (see Table F- 1 Demographic statistics for the senior manager Sample).

The design of the study was a 2 (type of committee: Tactical vs. Strategic) X 3 (Candidate: CMO, CIO, CFO) within-between-subject factorial design. Participants were told that they were participating in a study that explores “first impressions of business professionals”. After reviewing the letter of information and informed consent, participants were reminded that the researchers were interested in their immediate thoughts and that there were no right or wrong answers. On the first page of the study, participants were given a brief scenario, which contained a short description of the decision-making situation. The scenario read:

“Since becoming CEO of PostPak – a large distribution company headquartered in Mississauga – Chris\textsuperscript{16} Bedders has met every Monday morning with the company’s three C-level officers – the Chief Information Officer (CIO), the Chief Financial Officer (CFO) and the Chief Marketing Officer (CMO). Based on the current company’s needs, Chris wants to select the most appropriate senior executive to join the following committee. Please read the headline of the committee and assist Chris in this important decision.”

The main reasoning behind this scenario was to place the three executives at the same level of hierarchical importance since there are occasions in which not all executives are invited

\textsuperscript{16} The name Chris was chosen to be gender neutral.
to regular C-level meetings. Followed by the previous scenario, a box containing the description of the committee was shown. In the first experimental manipulation (between-subjects), the objective was to present a committee with more tactical/operational responsibilities. The scenario for the committee read: “This committee will improve the overall efficiency of the internal processes of the organization with the objective of reducing costs”. The second experimental manipulation consisted of a committee with more strategic responsibilities. The scenario for this committee read: “This committee will develop a clear picture of where the company needs to be headed over the next 5 to 10 years.”

These two committees were pre-tested by asking ten PhD candidates from different areas of business and five business professors to rate three versions of each committee. On 5-point Likert-type scales, participants rated the committees on their tactical/operational and strategic underlying purpose. The final versions were perceived as the most technical/operational (M = 4.5, SD=0.54) and strategic (M = 4.8, SD=0.38) versions respectively.

4.3.1.2 Dependent measures

*Candidate suitability ranking*

After reading the scenario and the description of the committee, participants ranked each executive from 1 = most suitable, 2 = medium suitable, to 3 = least suitable for the committee that they were randomly assigned.

*Perceptions of “good-fit”*

Participants then were asked to rate the “good-fit” of each of the candidates for the assigned committee. On a 5-point Likert-type scale, the items that formed this measure were: “would be a ‘good fit’ for this committee” (1 = an extremely bad fit, 5 = an extremely good fit), “would be suitable for this committee” (1 = not suitable at all, 5 = extremely suitable), and “would be successful in this committee” (1= not successful at all, 5 = extremely successful). The
composite variable was reliable for the two sample populations (CMO group $\alpha = .91$; CIO group $\alpha = .95$; CFO group $\alpha = .89$).

4.3.1.3 Results

Data analysis strategy

For the dependent variable candidate suitability ranking, a chi-square test ($\chi^2$) was conducted to compare the proportions of the most preferable C-level member (i.e., ranked number 1) between each committee (e.g., tactical vs strategic) and thus test the general hypothesis that CIOs would be less preferable (i.e., and would therefore have less opportunity) than other C-level executives to engage in a strategic initiative. The tactical/operational committee acted as a control condition to show the different effects on stereotype congruence/incongruence. Two chi-squares tests were conducted to analyze this section. The first approach was to identify any significant association between the candidate preference and the type of committee. In the second approach, I compared each committee choice to a fair baseline where they were chosen with equal probability (i.e., 33%).

For the second dependent variable (i.e., good-fit ratings), I ran a 2 (type of committee: Tactical vs. Strategic) X 3 (Candidate: CMO, CIO, CFO) mixed ANOVA to test the specific hypotheses that CIOs would receive lower suitability (i.e., good fit) ratings for strategic committees but higher suitability ratings for tactical committees than all of the other candidates.

Candidate suitability ranking

Figure 5 shows the proportions of the most suitable candidates for each type of committee\textsuperscript{17} for the student sample, providing evidence of an association between most suitable

\textsuperscript{17} The proportions on the x-axis represent the number of observations for each level of the X variable (i.e., type of committee). The proportions on the y-axis on the right represent the overall proportions of CMO, CIO, and CFO groups for the combined levels (strategic and tactical). The scale of the y-axis on the left
candidate and type of committee (e.g., the side-by-side segmented bar charts are different). There was a statistically significant association between most suitable candidate and type of committee, \( \chi^2 = 12.125, p = .0023 \). For the strategic committee, CIOs were the least preferable choice (18%), followed by CMOs (36%) and CFOs (46%). For the tactical committee, CIOs were the most preferable choice (48.08%) followed by CFOs (36.54%) and CMOs (15.38%) (see Figure 5 below and Table F-2 in Appendix F for a contingency table results). When compared to a fair base line (i.e., equal probability of being chosen is 33%), CIOs were favored in the tactical committee (with estimated probability of 48%), followed by CFOs (with estimated probability of 36.5%) and CMOs (with estimated probability of 15.4%) and with a \( \chi^2 = 9.43, p = .009 \) (see Table F-4 in Appendix F for details). For the strategic committee, CIOs were rated number one much less frequently than an equal probability assignment (with estimated probability of 20%), followed by CMOs (36%) and CFOs (44%) with \( \chi^2 = 6.49, p = .0389 \) (see Table F-5 in Appendix F for details).

shows the response probability with the whole axis being a probability of one (representing the total example).
Figure 5 Suitability ranking (number one) - student sample (Study 3)

For the senior manager sample, the results are basically the same as with the student sample. There was a statistically significant association between most suitable candidate and type of committee, $\chi^2 = 30.050$, $p < .001$. For the strategic committee, CIOs were the least preferable choice (13.33%), followed by CMOs (46.67%) and CFOs (40%). For the tactical committee, in contrast, CIOs were the most preferable choice (57.58%) followed by CFOs (42.42%) and CMOs (0%) (see Figure 6 and Table F-3 Contingency Table for 1st ranking suitability senior manager samplea contingency table results). When compared to a fair base line (i.e., equal probability of being chosen number one is 33%), CIOs were favoured in the tactical committee relative to equal probability (with estimated probability of 57%), followed by CFOs (42%) and CMOs (0%) and with a $\chi^2 = 27.52$, $p < .001$ (see Table F-6 in appendix F for details). For the strategic committee, CIOs were shunned relative to equal probability (with estimated probability of 13%), followed by CMOs (47%) and CFOs (40%) with $\chi^2 = 3.88$, $p < .05$ (see Table F-7 in Appendix F for details).
88

Figure 6 Suitability ranking (number one) - senior manager sample (Study 3)

Perceptions of “good-fit”

Figure 7 shows mean “good-fit” perceptions by candidate (i.e., CMO, CIO, CFO) and type of committee (i.e., tactical versus strategic) for the student sample. The ANOVA results revealed a highly significant interaction between candidate and type of committee, $F(2,192) = 26.567, p < .001$. Specifically, a planned contrast analysis revealed that CIOs ($M = 3.3, SD = .133$) were rated significantly lower on “good-fit” for the strategic committee than CFOs ($M = 4, SD = .121, MD = -.729, p < .001$) and CMOs ($M = 3.8, SD = .100, MD = -.450, p < .05$). However, in the tactical committee, CIOs ($M = 3.9, SD = .121$) and CFOs ($M = 3.9, SD = .091, MD_{CIO-CFO} = -.085, ns$) were rated significantly higher on “good-fit” than CMOs ($M = 2.6, SD = .114, MD_{CIO-CMO} = 1.285, p < .001$ and $MD_{CFO-CMO} = 1.369, p < .001$). Additionally, there were significant main effects of type of committee on “good-fit” perceptions for the CIO ($F(1,96) = 11.23, p < .001$) and CMO ($F(1,96) = 44.9, p < .001$) groups. CIOs were significantly perceived as a better fit for the tactical committee than for the strategic committee and CMOs were significantly perceived as
the opposite. No main effects were found for the CFO group \((F (1,96) = .086, \text{ ns})\). The absolute scores revealed that CFOs were perceived as a good-fit for both committees.

![Figure 7 “Good-fit” ratings - student sample (Study 3)](image)

The senior manager sample yielded results that were virtually identical to the student sample. The ANOVA results revealed a highly significant interaction between candidate and type of committee, \(F (2,106) = 35.202 \ p < .001\). Specifically, a planned contrast analysis revealed that CIOs \((M = 2.98 \ SD = .68)\) were rated significantly lower on “good-fit” for the strategic committee than CFOs \((M = 3.8 \ SD = .92, \ MD = -.828, \ p < .001)\) and CMOs \((M = 3.94 \ SD = .56, \ MD = -.951, \ p < .001)\). In the tactical committee, CIOs \((M = 4.15 \ SD = .66)\) and CFOs \((M = 3.7 \ SD = .75, \ MD_{\text{CIO-CFO}} = .444, \text{ ns})\) were rated significantly higher on “good-fit” than CMOs \((M = 2.64 \ SD = .82, \ MD_{\text{CIO-CMO}} = 1.5, \ p < .001 \text{ and } MD_{\text{CFO-CMO}} = 1.06, \ p < .001)\) (Figure 8).
Additionally, there were significant main effects of type of committee on “good-fit” perceptions for the CIO ($F(1,53) = 40.7 p < .001$) and CMO ($F(1,53) = 44.7 p < .001$) groups. CIOs were significantly perceived to be a better fit for the tactical committee than for the strategic committee and CMOs were significantly perceived as the opposite. No main effects were found for the CFO group ($F(1,53) = .252, \text{ ns}$). The absolute scores revealed that CFOs were perceived as a good-fit for both committees.

One-way ANOVAs and t-tests were conducted to examine differences in senior managers’ responses on perceived “good-fit” ratings on demographic variables such as their organization’s level of IT (e.g., low, medium, high), company size (e.g., small, medium, large), and gender. No statistical differences were found across these demographic variables within each group. Please refer to Appendix F, Tables F-8 to F-13 for details.

![Figure 8 “Good-fit” ratings - senior manager sample (Study 3)](image-url)
4.3.1.4 Discussion

These results support the hypotheses that CIOs would be rated less favourably than either CMOs or CFOs for strategic initiatives (H3a), but would be rated more favourably for tactical tasks (H3b). Students and senior managers both ranked CIOs as their last choice judging them to be less suitable (i.e., not a “good-fit”) for joining a strategic initiative that involved setting a vision for the organization. However, CIOs were ranked as highly suitable for joining a more tactical/operational initiative that involved identifying deficiencies to improve internal business processes. These findings suggest the existence of a functional bias rooted in stereotypes that make CIOs a good-fit for tactical roles and incongruent for strategic roles. In line with the lack-of-fit model and role congruity theory and results from Studies 1 and 2, the results of Study 3 suggest that the CIO stereotype promotes negative expectations about a CIO’s promotion to a strategic role by creating a perceived “lack-of-fit” between the attributes CIOs are thought to possess and the attributes thought necessary to perform in strategic roles. As a result, these perceptions can detrimentally affect the promotion of CIOs for strategic opportunities.

Studies 1 and 2 show that the beliefs about how CIOs, C-level executives, CFOs, and CMOs comprise descriptive stereotypes\(^{18}\) that are, not only different, but virtually opposite. Leadership competency was the defined characteristic of the C-level executive stereotype, and problem-solving was the defined characteristic of the CIO stereotype. Leadership competency primarily denotes achievement orientation (e.g., ambitious, driven, enterprising) and an inclination to take charge (e.g., assertive, dominant). Problem-solving, on the other hand, denotes traits that suggest competency on problem identification and innovativeness (e.g., detail-oriented,\(^{18}\)

\(^{18}\) Descriptive stereotypes are consensual beliefs and expectations about what members of a group are like whereas prescriptive stereotypes are beliefs and expectations about what a group people should or should not be like (Eagly and Karau 2002; Heilman 2001).
curious, innovative, task-oriented). In other words, CIOs are seen as lacking what is thought to be most prevalent in C-level executives (e.g., leadership competency), and C-level executives are seen as lacking what is most prevalent in CIOs (e.g., problem-solving competency). But, stereotypical beliefs of CIOs are not necessarily problematic; they are only problematic in work settings to the extent that they negatively affect expectations about a CIO’s performance. Performance expectations, however, are determined not only by perceptions of what an individual is like but also by their “fit” with attributes thought necessary to effectively perform a task (Eagly and Karau 2002; Heilman 2001; Heilman et al. 1989).

Descriptive stereotypes can create problems for CIOs when there is a perceived “lack-of-fit” between a CIO’s attributes and the attributes believed to be required to succeed in strategic roles traditionally occupied by other senior managers. As explained earlier in the conceptual development, corporate strategic roles, which include joining a corporate strategy committee or being part of the corporate board, are believed to require characteristics that coincide with stereotypical beliefs of other C-level executives (e.g., CFOs, CMOs), but contrast with the stereotypical beliefs of CIOs. Although problem-solving traits such as being task-oriented, detail-oriented and having the ability to find innovative solutions are important management characteristics (Reiter-Palmon and Illies 2004; Zaleznik 1977), they are seen as more appropriate characteristics for tactical and operational roles. The perception of what it takes to be successful in strategic roles remains largely tied to leadership qualities, especially an achievement orientation and the inclination to take charge (Schein 2001). As a result and in accordance with results of Study 3, CIOs are thought to be well equipped for success in tactical roles but deficient in the qualities required for success in corporate strategic roles.
Interestingly, CFOs were perceived as a proper fit for both strategic and tactical tasks. That is, CFOs were seen to possess characteristics required to successfully perform strategic and tactical tasks. A plausible explanation for the perceived good-fit in both roles derives from the stereotypical beliefs of CFOs. In addition to be perceived as possessing strong leadership qualities (e.g., high in assertiveness and dominance), professionals with accounting or finance backgrounds have also been stereotyped as reserved, somewhat less extrovert than the average individual, and detail-oriented (Coate et al. 2003). Seemingly contradictory, these stereotypical beliefs therefore make CFOs a good-fit for the perceived requirements of strategic and tactical tasks. Also, the positive responses towards the tactical task may have been enhanced by the phrase “reducing costs” in the description of the tactical committee; that is, the word “costs” may have led respondents to select a candidate with financial expertise.

Study 3 did not explicitly examine the prescriptive stereotypes (i.e., perceptions of what CIOs should do or shouldn’t do), however, the manipulation of type of committee (i.e., tactical versus strategic) and the suitability choice among different CxOs (i.e., including the CIO) served as an unobtrusive measure of prescriptive stereotypes (e.g., Glick et al. 1988; Grant and Mizzi 2014; Pingitore et al. 1994; Powell and Butterfield 1994). Studies in gender stereotypes have demonstrated that there is overlap in the content of prescriptive and descriptive gender stereotypes; for example, the attributes and behaviours that are highly valued for men and women also the ones that are prescribed for them (Heilman 2012). That is, descriptive stereotypes of CIOs as lacking leadership skills promotes negative expectations about a CIO’s performance in strategic roles by creating a perceived “lack-of-fit” between the attributes CIOs are thought to possess and the attributes thought required for success in strategic roles. Prescriptive stereotypes establish normative expectations for CIOs’ role, resulting in the devaluation or derogation of
CIOs who directly or indirectly violate the norm. This is the theoretical logic of the Lack of Fit model (Heilman 1983, 2001) and the Role Congruity theory (Eagly and Karau 2005).

Similarly, the self-perpetuating quality of stereotypes (Johnston and Hewstone 1992) can also influence the way in which information is processed. Expectations tend to bias information in a manner that allows them to be preserved over time, which becomes self-reinforcing. Social research has demonstrated that expectations act as a perceptual filter, directing attention away from disconfirming information (e.g., finding a very strategic CIO) and toward confirming information (e.g., finding a CIO in a tactical role) (Johnson and Judd 1983). Therefore, people tend to resist disconfirming evidence and thus maintain a stereotype. Similar to Studies 1 and 2, students’ and senior managers’ suitability rankings and ratings were similar, which suggests that prescriptive stereotypes of CIOs are also consistent over time.

The persistence of performance expectations and their influence on decision making can have important and broad-ranging consequences for the role of CIOs in organizations. This study (i.e., Study 3) provided evidence of such bias in organizational role placement (i.e., promotion) decisions. In the next study (Study 4), I determine whether CIOs are exposed to bias when assigned to strategic tasks.

4.3.2 Study 4

4.3.2.1 Method

Forty-two undergraduate business students (58% female) participated in a 2 (Target: CIO versus CMO) X 2 (Performance: No Mistake versus Mistake) between-subjects experiment. The same “first impressions of business professionals” cover story from Study 3 was used in this study. Participants were randomly assigned to one of four conditions. On the first page of the study, participants were given a brief scenario of a decision-making situation. The scenario
consisted of a CIO or CMO (target manipulation) named Chris who was appointed by the CEO to evaluate the firm’s online strategy and develop a new strategy to add long-term value to the firm. They then read that Chris implements a variable pricing scheme to lower the price of older products that have become less popular. The end of the story is varied to create an outcome that is yet to be assessed (i.e., the “no mistake” condition or control condition) and an outcome where the new implementation produced harmful results for the firm (i.e., the “mistake” condition). The participants were then asked to rate certain actions against and/or in favour of Chris based on the events described in the story.

Importantly, given the specific interest in examining the influence of stereotype profiles on performance evaluation, several steps were taken across scenarios to emphasize the stereotypes but also to reduce bias in the favouritism of one candidate over the other. First, a short introductory paragraph described the career path of each senior manager as an employee who grew within the company from each respective functional background (e.g., IT department or Marketing department) and who was known stereotypically as the “IT Guy” or “Marketing Guy”. Both candidates were also placed on the same hierarchical level as senior managers who were invited to join the senior executive team and expected to support the firm’s objectives. The task involved a strategic activity for the organization in order that it would be incongruent for the CIO and congruent for the CMO. However, the intention was to mitigate the effects of functional stereotyping so the task was careful to contain IT- (e.g., online) and marketing- (e.g., pricing) related words (see Appendix G for scenarios details).
4.3.2.2 Dependent measures

*Competence ratings*

After reading the scenario, participants rated the target’s competency for the assignment on a 5-point Likert-type scale from strongly disagree = 1 to strongly agree = 5. The items that comprise the measure were: “Chris is competent”, “Chris is knowledgeable”, and “Chris is capable”. The composite variable was reliable (α = .81).

*Performance actions*

Also on a 5-point Likert-type scale from strongly disagree = 1 to strongly agree = 5, participants then answered six questions about actions to take to either reward or punish the candidate based on their performance as based on the events described in the scenario. Positive actions were “Chris should be promoted”, “Chris should get a pay raise” and “Chris should get more responsibility”; the negative actions were “Chris should be fired”, “Chris should get a pay cut”, and “Chris should get less responsibility”. The positive and negative performance actions were analyzed independently and both were highly reliable (α = .91 and α = .93 respectively).

4.3.2.3 Results

*Data analysis strategy*

The analysis on the competence ratings (i.e., the dependent variable) served as a manipulation check to assess the fairness of the task regarding the potential bias towards the functional background of each target. I ran a 2 (target: CIO versus CMO) x 2 (performance condition: no mistake versus mistake) ANOVA to test this potential bias. For the dependent variable performance actions, I ran a 2 (target: CIO versus CMO) x 2 (performance condition: no mistake versus mistake) ANOVA on each subgroup, the positive and negative actions.
**Competence ratings (manipulation check)**

ANOVA revealed no main effects on both target and performance condition on competence ($F(1, 74) = .790$ and $927$, ns). Participants considered the CIO ($M = 3.9$ $SD = .50$) and CMO ($M = 4.1$ $SD = .57$) similarly competent for the assigned task in the no-mistake condition and the mistake condition ($M_{CIO} = 3.7$ $SD = .50$ and $M_{CMO} = 3.8$ $SD = .72$).

**Performance actions**

Figure 9 shows the mean for the negative performance actions across the four experimental conditions. The ANOVA results revealed an interaction between target and performance condition, $F(1, 66) = 8.048$, $p < .05$. A planned contrast analysis revealed that CIOs ($M = 2.6$, $SD = .54$) received significantly more negative performance actions than CMOs ($M = 2.1$, $SD = .51$) when making a mistake. Simple effects analyses revealed that when CIOs’ ($F(1, 34) = 11.96$, $p < .05$) made a decision that led to a negative outcome for the firm (i.e., mistake condition), participants attributed more negative performance action to them than to CMOs ($F(1, 32) = .007$, ns).

![Figure 9 Negative performance actions ratings – student sample (Study 4)](image-url)
The ANOVA results for the positive performance actions revealed a main effect of performance condition on positive performance actions ratings for both the CIO and CMO. CIOs ($M_{no\text{-}mistake} = 3.1, SD = .67, M_{mistake} = 2.1, SD = .34; \ F(1, 38) = 31.196, p < .001$) received significantly higher positive performance actions in the no mistake condition than when a negative outcome was assessed. A similar result happened for the CMOs ($M_{no\text{-}mistake} = 3.4, SD = .72, M_{mistake} = 2.1, SD = .58; \ F(1, 36) = 32.111, p < .001$). However, a 2 (target: CIO versus CMO) X 2 (performance: no mistake versus mistake) ANOVA revealed no significant interaction between target and performance condition. CIOs and CMOs received equally positive performance ratings in both conditions. Thus, it appears that negative evaluation performance measures (i.e., negative performance actions) have a more devaluing effect than positive evaluation performance measures.

4.3.2.4 Discussion

Study 4 examined another potential bias of CIO stereotypes – are CIOs more likely to fall from their positions once they are in a strategic role due to stereotype incongruence in these roles? Study 4 found that despite the fact that the CIOs and CMOs were viewed as being equally competent to perform a strategic task, when a mistake occurred, the CIO was more harshly evaluated than the CMO who made the same mistake and performed the same task. However, when they did not make any mistake and no performance outcome was divulged, both senior managers were accorded similar performance evaluations. These results support previous studies that documented potential mechanisms for “glass-cliff” effects, especially that making mistakes on the job is particularly damaging to individuals in stereotype-incongruent roles (Brescoll et al. 2010; Ryan and Haslam 2005). While Study 3 demonstrated that CIOs were denied assignment to
strategic tasks due to the perceived job-incongruence or lack-of-fit of CIOs for strategic roles, Study 4 complemented and extended these results by demonstrating that in addition to hitting the “glass ceiling” impeding their rise to corporate strategic roles (i.e., Study 3), CIOs can also find themselves targets of “glass cliff” effects (i.e., Study 4).

Previous studies have documented the struggle that CIOs face when trying to leverage strategic business results with IT (Hirschheim et al. 2003; Karahanna and Watson 2006; Peppard 2010); even more so, they are typically held solely responsible when these results are not satisfactory or when IT projects fail (Johnson 2012; Peppard 2010). Study 4 suggests a plausible explanation for this issue: CIOs who successfully reach strategic positions in their organizations tend to be more harshly judged than business counterparts and assigned personal blame in the context of failure. Negative performance expectations produced by the lack-of-fit of CIOs in strategic roles encourage evaluators to apply the CIO stereotype of leadership incompetence when assessing CIOs’ performance in failure situations. This finding is in accordance with the attribution (i.e., inferences) and recognition process in the context of leadership (e.g., romance-of-leadership theory) (Carton and Rosette 2011). Perceived leadership competence is seen as a causal mechanism that affects performance (Meindl and Ehrlich 1987). Hence, when minority leaders fail, perceivers would tend to attribute the failure to their weak leadership qualities. When CIOs made a mistake, perceivers activate and apply the incompetence leadership stereotype ascribed to CIOs and, as a result, assign blame commensurately.

Also, attribution theory (Kelley and Michela 1980) argues that individuals make sense of their environment by making inferences (i.e., attributions) about the attributes of other people, or simple deductions related to cause and effect: positive outcomes are caused by positive attributes, and negative outcomes are caused by negative attributes. That is, there was a perceived “fit”
between the negative valence of attributions that are deduced from the outcome of the situation (i.e., mistake that affected firm performance) and the negative valence of the attribute that is typically drawn from CIO stereotypes (i.e., leadership incompetence in strategic roles). This inference is striking by implying the existence of an unsettling bias that can undermine the achievements of those CIOs who have made progress in reaching corporate strategic positions.

Notwithstanding the participants of this study were only business students, the high consistency between students and senior managers responses found in the previous three studies, the persistent nature of stereotypes (i.e., information seeking-strategies, self-fulfilling prophecy), and the anecdotal evidence found in previous studies that discuss the blame attributed to CIOs in organizations, led me to infer that the results obtained in this study would be similar to the senior manager sample. Duplicating this study with senior managers is planned for future research.
Chapter 5

General Discussion

This research began with an observation of the challenges faced by CIOs in their endeavours to realize IT value for their organizations. One such challenge is the apparent and persistent disconnect between the criticality of IT to organizational success and the relegation of CIOs to tactical rather than strategic roles in their organizations, limiting the transformative power of IT as a competitive weapon. I then put forward the claim that CIOs may face a glass ceiling (similar to women) and that widely shared stereotypes might deny them the opportunity to drive the organization forward in the use of IT.

The dissertation found evidence of the existence of a widely shared CIO stereotype held by perceivers outside the IT profession. It also identified and demonstrated the contexts within which these stereotypical beliefs can bias decision making concerning the role of CIOs. One of the central contributions of the current work is the identification of a functional background bias that can cause inequality perceptions at strategic levels of the organizations; specifically, the perception of CIOs as unequal members of the C-suite can limit their potential contribution to corporate decision-making and strategic involvement. The assertion of CIOs as “the last among equals” has been previously described (e.g., DeLisi et al. 2010; Peppard et al. 2011; Rothfeder and Driscoll 1990) and in many occasions rejected (e.g., King 2011); however, to my knowledge no study has empirically examined it. In general terms, this research suggests that CIOs (i.e., when perceived as a demographic minority in the C-suite) face potential barriers to exerting influence, and that one barrier is facing the bias produced by stereotypes.
The current research also found evidence to suggest that such stereotypical beliefs can be consistent and persistent over time, thereby revealing the self-reinforcing aspect of stereotypes as well as the difficulty of changing any already established bias (prejudice). The findings of this research, hence, advanced our understanding of the persistent ‘perception gap’ (i.e., ‘IT-business gap’) that has intrigued (and plagued) IS researchers for a long time.

Across four experimental studies, the present research examined the existence of a CIO stereotype and identified two main contexts (i.e., promotion and performance evaluation in strategic roles) within which the stereotype can potentially create biases. The first two studies explored the content of a CIO stereotype and compared this stereotype with those of an IT professional, a C-level executive, a CFO, and a CMO. These studies revealed that the CIO stereotype was different from the C-level executive stereotype but closely aligned with the IT professional stereotype, thereby supporting the assumption that the stereotypical beliefs of CIOs are strongly rooted in aspects of the general IT stereotype. It was further found that the stereotypical beliefs about CIOs can be interpreted along two dimensions – leadership and problem solving and that these dimensions can be the basis for the perceived differences between CIOs and C-level executives. CIOs were characterized as significantly possessing fewer leadership traits than a general C-level executive, but as possessing more problem-solving and analytical traits.

Results regarding the specific differences between CIOs and other C-level executives (i.e., as comparison groups, the study examined CFOs and CMOs) found that these organizational roles can be differentiated on the basis of two important leadership dimensions: social (e.g., openness, sociability, communication) and taking charge (e.g., assertiveness, and dominance). CIOs were perceived as possessing similar social leadership traits as CFOs (i.e., CIOs were rated
higher than CFOs on openness, but similar on sociability and communication), while CMOs were rated the highest in this domain. CIOs were rated the lowest in the “taking charge” leadership dimension (i.e., CIOs were perceived as possessing less assertiveness and dominance traits than either CFOs and CMOs). These results support the dominant belief that CIOs are perceived as technical specialists lacking the full set of broad managerial skills (i.e., leadership skills), and often considered the “last among equals” (DeLisi et al. 2010; Karahanna and Watson 2006; Peppard 2010; Peppard et al. 2011).

Given that these beliefs were widely shared among business students and senior managers across organizations, the next question that this research examined was how (or if) they impact the role of the CIO. Therefore, in two empirical studies, I explored the effects of these stereotypical beliefs on decisions concerning promotion and performance evaluation. Results regarding the opportunities to be promoted to a strategic role found that when compared to a CMO and a CFO, the CIO was viewed as the last choice and least suitable candidate for this role. These results were opposite when the allocation was to a tactical and more operational role. Participants rated the CIO as a well-suited candidate for this role. These results demonstrated the role congruity belief that CIOs are well-equipped senior managers for tactical and operational roles, but ill-equipped for strategic roles, thereby also demonstrating the existence of a CIO stereotype that can influence CIOs’ opportunities to corporate strategic involvement because CIOs are thought to lack leadership competencies required for such involvement.

Overall, the results regarding performance evaluation in a strategic role extended and complemented the previous results by showing a potential bias in performance evaluations of CIOs. Participants viewed a CIO as deserving more devaluing punishment (e.g., “should be fired”) than a CMO when both performed the same task and made the same mistake. However,
when the comparison condition was “no mistake”, both executives’ performances were rated similarly. Also, both students and senior managers stereotypically profiled all these professionals similarly in the first three studies. These results firmly support the consistency and pervasiveness of stereotypes.

Taken together, this work makes several contributions to our understanding of the CIO role and IT leadership. This dissertation finds support for (and at the same time challenges) several anecdotal assumptions about the existence of stereotypical beliefs surrounding the role of the CIO and the potential biases derived from it. As suggested by IS scholars (e.g., Hirschheim et al. 2003; Peppard 2010; Tallon 2014), most of the IS research has focused on the “wining CIO qualities”, “IT benchmarking” and developing “IT performance and operations measures” instead of understanding the dynamics of perceptions in order to shape and manage them at the top management level where the decisions related to IT take place. This dissertation follows this suggestion and examined the perceptions of CIOs held by senior managers (and business students) and the contexts in which they can produce bias decisions against the CIO. As such, it brings a novel theoretical perspective for explaining the continued and persistent “IT-business gap” in organizations and the lack of CIO active participation in top management teams. In the next sections, I discuss the implications and highlight associated avenues for future research.

5.1 Implications and Avenues for Future Research

5.1.1 The persistent nature of stereotypes

One of the most striking findings of the present research is that in all three studies where students and senior managers were participants, there were no major differences with regards to stereotype content (i.e., perceptions of CIOs) and functional background bias in promotion decisions. Both business students and senior managers from different backgrounds and
industries stereotypically profiled the CIO and the other executives similarly and consistently. Specially, their beliefs of CIOs were highly aligned with their beliefs of IT professionals (e.g., techy, detail-oriented, geek, innovative). Analyzing across the three studies that used students and senior managers as participants found no differences on responses by gender, firm size, level of IT intensity within each sample population. Despite their greater work experience and thus interactions with other professional groups including CIOs, senior managers appear to hold the same general stereotypical beliefs as students. This finding seems to contradict the contact hypothesis’ premise (Allport 1979) that one of the best ways to reduce prejudice between majority and minority group members is increased interaction because it enhances personalization and individuation. That is, the social categorization process that occurs among members of different social groups decreases over time as members attend more to individuating information (Brewer and Brown 1998). The more individuals interact with members of other identity groups, the less stereotypes are usually prevalent. This pattern was not observed in this research.

First, within the student sample, the stereotypes did not change over the student’s four years of their business program. Despite taking advanced courses in different areas of specialization, working in summer-internships and being forced to make career decisions, students’ stereotypes remained inviolate. Similarly, senior managers, many of whom were CEOs and had ten or more years of experience, expressed the same stereotype. What explains these beliefs? Why do these beliefs persist despite increased interaction? As suggested earlier, the persistence of the belief by some in the dominant (majority) group that minorities are less suited for management (e.g., glass ceiling) are a result of social psychological processes, institutional barriers, and historical roles (Jackson 2001). In this dissertation, the social psychological process was primarily examined.
Stereotypes (and the expectations derived from them) tend to bias information in a way that allows them to be maintained, and even when disconfirming information is presented, they are resistant to change (Johnston 1996; Richards and Hewstone 2001). The subtyping/subgrouping model was discussed earlier to explain this persistence. That is, most stereotypes endure because perceivers create subtypes to preserve the general stereotype. This research showed the existence of a widely-shared CIO stereotype that largely overlapped with the content of the IT professional (subgroup) but differentiated from the content of a prototypical C-level (subtype). The existence of a widely-shared stereotype prompts perceivers to subtype individuals who disconfirm the stereotype, thereby limiting, impeding, or even preventing stereotype change (Richards and Hewstone 2001). For instance, if the standard stereotype of CIOs is that they are perceived as techy and detail-oriented, the existence of some “non-techy” and “people-oriented” CIOs may not lead to a general revision of the stereotype, rather these individuals will either be located in a subtype, leaving the existing CIO stereotype unchanged, or perhaps will not be considered “real CIOs” at all. The persistence and consistency of this belief was also found between high tech and low tech organizations. Although the senior manager sample was relatively small and moderating analysis could not be conducted, a simple comparative analysis suggested that the structure of beliefs remains the same across organizations regardless of their level of IT. The widely-shared stereotypical belief of CIOs was anchored in the IT professional stereotype. Future research should further examine and test whether or not these beliefs indeed differ based on the IT level of the organization. For example, would senior managers from high tech organizations possess fewer stereotypical beliefs of CIOs than low or medium tech organizations? Another interesting moderating analysis would be the strategic view of IT (i.e., IT is a strategic differentiator). Would organizations where senior managers share a
strategic view of IT as a strategic differentiator view CIOs as more competent in leadership skills and less as “techies”?

The comparison between students and senior managers was only a proxy to examine the persistence of these beliefs over time. Another venue for future research is to investigate this persistence in natural settings. For example, a longitudinal study could investigate the resistance to change of stereotypical beliefs for newly appointed CIOs (and maybe for atypical or stereotype-disconfirming CIOs) in organizations that have traditionally viewed the CIO as a service provider. Also, it would be interesting to examine the organizational barriers facing the newly appointed CIO, what s/he does in order to overcome these barriers, and how long it takes to change those perceptions (if a change occurs).

5.1.2 Functional background bias against CIOs

In addition to examining the content of stereotypical CIO beliefs, the present research identified potential contexts wherein these beliefs could create bias (or prejudice) against CIOs. The results suggest that bias could occur in the allocation to strategic roles and in performance assessments. These results further implicate stereotypes in explaining potential root cause for the long-existing “perceptions gap” or “IT-business gap” that has prevented CIOs (and the IT organization) from playing a more strategic role in organizations.

The beliefs that CIOs are ill-equipped to handle strategic tasks can influence the way in which information about them is processed. Stereotype-based performance expectations have a significant effect on information processing, prompting cognitive distortions that form the basis of bias in performance evaluations (Eagly and Karau 2002; Heilman 2012). As it happens in the subtyping process explained earlier, cognitive distortions (i.e., errors in thinking) enable expectations to withstand disconfirming evidence – cognitive distortion in what information is
attended to, how it is interpreted and which of it is recalled. Each of these aspects has different consequences for job evaluations and decisions (Eagly and Karau 2002). Because stereotype-performance expectations can bias attention, interpretation, and recall of evaluators (e.g., CEO, CxOs), assessments of CIO’s performance competence are likely to be negatively affected and, accordingly, opportunities for their advancement and attainment of organizational rewards hindered.

Because this research empirically identified the existence and potential consequences of biases in hypothetical scenarios, questions can be raised about whether these findings generalize to field settings of actual performance evaluations of CIOs. According to the construal level theory (Trope and Liberman 2003), people attend to more detail when they are close up than when they are psychologically remote from a target. As such, when evaluators perceive CIOs in actual organizations settings, they may expend more effort to pay attention to details and thus rely less in stereotypes. However, it has also been suggested that, given the cognitive demands and complexity of organizations, decision makers (evaluators) have little time to process information extensively (Chung-Herrera and Lankau 2005). Hence, they may be likely to use stereotypes as a heuristic in perceiving, interpreting, and recalling the behaviour of CIOs for job promotions or performance evaluations. In fact, earlier studies have shown that when people holding stereotypes encounter both stereotype-consistent and stereotype-inconsistent information about an individual, they tend to tilt toward stereotypical judgments (Darley and Fazio 1980; Wittenbrink et al. 1997).

The specific aspects of this bias are explained in detail:

**Attention**

Expectations can influence what information is focused on. Prior studies have demonstrated that expectations act as a perceptual filter, directing attention away from disconfirming information and toward confirming information (Johnson and Judd 1983). That is,
information that is inconsistent with expectations is usually not even noticed. But even when the information is noticed, it might not be involved in the process of impression formation. It may be considered irrelevant or attributed to external factors, thereby maintaining the original expectation (Swim and Sanna 1996). Research has found evidence for these ideas, indicating that evaluators spend less time paying attention to work behaviours of individuals about whom there are stereotype-based expectations (e.g., minorities), than individuals for whom such expectations do not exist (Favero and Ilgen 1989).

**Interpretation**

The interpretation of a particular behaviour can also vary greatly depending on the expectations. Kunda et al. (1997) reported that the behaviour performed by individuals about whom there are different expectations (e.g., individuals in an incongruent-job) have been shown to be taken very differently. For instance, changing a course of action might be viewed as flexible or open-minded when performed by a man, but as weak or indecisive when performed by a woman. It has been demonstrated that when targets are of different sexes and races, the implications drawn from their behaviour can be different (Carton and Rosette 2011; Fiske and Taylor 1991).

**Recall**

Memory can also be biased by expectations (Cantor and Mischel 1979). Prior research has shown that people tend to recall more expectation-consistent than inconsistent information about another, even falsely ‘recalling’ expectation-consistent behaviours that did not actually happen (Fisk and Neuberg 1990; Higgins and Bargh 1987). Expectations have in fact been shown to be more powerful than memories of actual behavioural events in making behavioural judgments (e.g., ratings, evaluations) (e.g., Baltes and Parker 2000; Cooper 1981; Martell et al. 1995).
Although these cognitive distortions were not tested in natural settings, one objective of the present research was to control for how much information was presented in order that the participants would rely solely on their expectations when responding to the surveys. The research demonstrated that stereotypes influenced their judgments. For example, participants may have directed their attention away from specific facts such as the hierarchical level of each executive. Each executive was placed at the same hierarchical level (i.e., reporting to the CEO) which, according to the CIO stereotype, can be considered disconfirming information if the CIO is perceived as an unequal member of the C-suite.

Future research should examine each of these aspects in field studies. For example, business cases in organizations that have harboured negative perceptions against the IT department and its executive might reveal interesting stories where attention, interpretation and recall have tilted toward stereotypical judgments against CIOs. Hirschheim and colleagues’ (2003) study provides an illustrative business case on the evolution of the corporate IT function and the role of the CIO at Texaco. They analyzed the on-going misconceptions that the top management harboured against its IT department (and IT executive) for over four decades despite the fact that the department was responsible for the success of the corporation. For nearly a half century, the IT function’s leadership was considered ineffective and constantly blamed for IT failures even when objective quantitative evidence proved the opposite (e.g., benchmarking reports, consultant’s reports, etc.). The failure of the CIO was mainly attributed to personality flaws, being too technology focused, unable to understand the business, and incapable of communicating effectively (Hirschheim et al. 2003; Ward and Peppard 1996). Similar perceptions have also been documented in studies (e.g. Cramm 2010; Gupta 1991; Hirschheim et al. 2003; Preston and Karahanna 2009; Ward and Peppard 1996) that argue the long and
persistent presence of an IT-business gap. This dissertation, thus, provides a plausible causal argument about the negative and persistent beliefs against CIOs.

5.1.3 CIOs are not viewed as prototypical leaders and are condemned to tactical roles

Leadership perceptions of CIOs can also be biased by stereotype-based performance expectations that downplay their strategic abilities in favour of emphasizing their tactical ones. The results from study 1 and 2 (content of the stereotypical beliefs) reveal that, when describing the CIO, the category of an IT professional was more broadly recalled than the category of a C-level executive. The perceptions of CIOs as not being C-level executives can have detrimental consequences for CIOs.

Researchers have used implicit leadership theories to explain leadership attributions and perceptions, distortions in behavioural ratings, and the assimilation of information around leadership labels and prototypes. These theories reflect cognitive structures or schemas specifying traits and behaviours that perceivers (e.g., followers, superiors) expect from leaders. According to Jelinek and colleagues (1983), these schemas provide people with an underlying structure of meaning that persists over time, shaping their perception, interpretations, and behaviour. That is, if a person is not categorized as a “leader” (i.e., sharing the prototypical traits of a pre-existing leader category), he or she is not likely to be recognized as a potential leader and thus not given the opportunity to be a leader. Because leadership is associated with good performance, an incumbent possessing low prototypical leadership traits is expected to fail and often not even considered for leadership positions. Leadership prototypicality also affects attributions of causality and responsibility (Lord et al. 1984).

Within the implicit leadership theories context, traits per se do not represent objective measures (i.e., realities) inherent to gifted individuals but rather perceptual abstractions or
summary labels that perceivers use to categorize individuals in leadership positions and aid them consequently to make sense of the behaviours that those leaders exhibit (Epitropaki and Martin 2004). That is, because other C-level executives (e.g., CFOs, CMOs) are likely to be perceived as meeting high standards for leadership competence, they are more readily to be accepted when they behave confidently and assertively. They are more likely to be thought of as leaders, to behave as leaders, and to emerge as leaders. For CIOs, being perceived as leaders and thus exhibiting high confidence and assertiveness may not be readily accepted or expected as readily as other C-level executives due to stereotypes ascribed to them.

Leadership perceptions can be critical for newly appointed CIOs. For a newly appointed CIO being effective and integrating successfully into a new assignment is making a good start. It has been suggested that it takes almost three years to fully develop mastery and influence in a new assignment (Gabarro 1987). This process is greatly influenced by the opportunities given because it can dictate the new incumbent’s freedom and ability to take actions. A fundamental theory in strategic human resource management suggests that an individual performance is a function of his/her ability (A), motivation (M) and opportunity (O) or, alternatively, $P=f(AMO)$ (Boxall and Purcell 2003); however, it all starts from the ‘O’ in the ‘AMO’ framework. Changes in the opportunities (O) created by top management lead logically to implications for the ability (A) and motivation (M) dimensions.

The present research focused on the “O” aspect of this theory. In that, if CIOs are not being perceived as competent business and strategic leaders, their freedom and opportunities to take charge might be limited; that is, if CIOs are generally perceived as service providers, their managerial opportunities would be limited to these roles. As mentioned earlier, a vast IS academic and practitioner literature has been dedicated to examining the personal competences,
attributes, and characteristics of successful CIOs (Peppard 2010) – the “A” and “M” parts of the AMO theory. This literature advises CIOs to become business savvy as opposed to techy savvy, acquire business degrees if those are lacking (e.g., MBAs), and learn to deal with the power issues resulting from organizational politics (Enns et al. 2001; Li et al. 2006). However, a recent study that examined the critical factors that influence the process of ‘taking charge’ for newly appointed CIOs found that CIO background (e.g., business degrees, industry) did not greatly influence the effectiveness of the CIO in the ‘taking charge’ process as much as the CEO’s vision for IT and expectations of its incumbent (Peppard, 2010). Peppard (2010) stated that possessing leadership competencies is only one aspect of the equation; opportunities to display and develop those competencies are also critical aspects for a CIO to be successful. The pattern of results of this research reveals that these aspects may be influenced by the presence and persistence of stereotypes that act as a subtle barrier, preventing CIOs the opportunity to develop and/or display leadership acumen.

5.1.4 The enabling effects of role ambiguity

Based on the lack-of-fit model and role congruity theory, this research found support for the prediction that a functional background bias in the promotion and performance evaluations is in part due to the perceived lack-of-fit or incongruence between the CIO and a strategic role, with the strength of the outcomes dependent on the degree of the perceived lack-of-fit and the resulting negativity of performance expectations. However, whether this lack-of-fit has detrimental effects on CIOs is not only determined by the negativity arising from these expectations; the level of ambiguity might also play a crucial role.

Future research is required to examine the enabling effects of ambiguity that can influence stereotype-based judgments against the CIO. Stereotyping thrives on ambiguity and
facilitates expectations to flourish (Stangor 2000). The more ambiguity surrounds, in this case, the CIO role, the more inferences would be needed, and the less often “accurate” evaluative judgments would occur. Thus, ambiguity provides an enabling context for biased judgments, facilitating subjectivity and cognitive distortion in information processing (Heilman and Haynes 2008). In this research, ambiguity (e.g., lack of familiarity with the role, little information in the scenarios) may have facilitated the prejudice against CIOs. In comparison with the CFO and CMO roles, respondents were less familiar with the role of the CIO. Thus, lack of familiarity with the role may have influenced the way respondents stereotypically described and assessed the CIO in the studies. Also, the scenarios had as little information as possible in order to create ambiguity in each context and, at the same time, encourage the use of stereotype expectations when judging the behaviour inquired. If more detailed information (e.g., MBA training for each candidate) would have been provided, participants would perhaps have relied less on stereotype-based judgments. Although, this research did not examine or demonstrate the facilitating effects of ambiguity, it sheds light on the potential effects of how the CIO role is perceived and assessed.

The ambiguous and paradoxical role of the CIO has already been described in practitioner articles (Heller 2013; Peppard et al. 2011). According to this literature, a key aspect of this ambiguity lies on the bipolar view of the role of IT in organizations: at one end is the belief that IT is a cost center; at the other, IT offers significant strategic opportunities. These beliefs are indeed at the core of the different perceptions of the CIO’s role, job tasks, reporting relationships, and expectations of what s/he is expected to accomplish. However, even when a more strategic view of IT exists within an organization, CEOs and C-level executives fail to understand their responsibilities in deriving value from IT investments (Smaltz et al. 2006) and
when this value is not obtained, blame is often attributed to the CIOs’ incompetence (e.g., lack of leadership skills) (Peppard 2010).

Despite vast IS research devoted to deriving a more precise measure of IT performance, organizations still face challenges when measuring the real value of IT (Melville et al. 2004). Firms rarely have objective performance metrics to link IT to sales and profitability and executives are then left with their perceptions on the scale and locus of IT impacts in their organizations (Tallon 2014; Tallon et al. 2000). As discussed earlier, perceptions are open to bias, error, and distortions and thus should be examined with suspicion, especially in a complex area as IT business value (Mezias and Starbuck 2003). Therefore, the more ambiguity surrounding the CIO role, the more perceptual measures (with potential cognitive distortions) are used in judging the CIO performance. Ambiguity is generally intensified when there is poor definition of the criteria for evaluation, when there is a lack of specificity concerning the evaluation process, and when there is confusion about the source of performance outcomes (Heilman 2012). As demonstrated in the studies of this research, in the absence of information clarity (e.g. detail information about the targets, roles, and evaluative criteria), stereotypical beliefs resulted directly in biased decision making. Therefore, various structural and procedural changes should be addressed to reduce ambiguity around the role of the CIO in order to avoid the reliance on stereotypes.

5.1.5 The target’s perspective: potential stereotype effects on CIOs’ self-evaluations

This dissertation examined the stereotypical beliefs of CIOs and potential effects when they are activated and applied in the minds of perceivers. Another interesting area of research adopts the target’s perceptive – what it feels like to be the target of stereotyping (Kunda 1999), how the knowledge that others may be perceiving you through the lens of a negative stereotype
might influence your understanding of their behaviour toward you, and/or how being aware that people like you are expected to perform poorly might affect your performance.

Stigma consciousness and stereotype threat – two theoretical concepts that have been studied in the stereotyping literature – specify how beliefs and expectations shape behaviour and performance. Stigma consciousness is the extent to which people are self-conscious about being a member of a stereotyped group and expect to be stereotyped by others (Brown and Pinel 2003). Members of any stereotyped group can experience stigma consciousness, but research reports that the most susceptible individuals are from groups that are negatively viewed and discriminated against (Pinel 1999). In contrast, stereotype threat is the fear that one’s behaviour may confirm or be understood in terms of a negative stereotype associated with one’s social group (Steele 1997). Stereotype threat decreases performance on tasks that are associated with a stereotype-relevant domain because it generates stress responses that affect performance of the stereotyped individual.

The CIO role is relatively new and evolving (Banker et al. 2011) and, as mentioned earlier, is highly ambiguous (Peppard et al., 2011; Strickland and Theodoulidis 2011). Some CIOs are members of the board of directors and report directly to the CEO while others report to the other chief officers (e.g., Chief Finance Officer). Some CIOs are expected to promote strategic initiatives, while others are encouraged to focus exclusively on the operations’ side of the IT function. CIOs can feel estranged in an environment dominated by professionals whose traditional role focuses on strategic decisions. As a result, CIOs are likely sensitive to the existence of the stereotypes ascribed to them (i.e., stigma consciousness) making them susceptible to its effects (i.e., stereotype threat). Both stereotype consciousness and stereotype threat might be expected to moderate the relationship between the stereotypical beliefs of CIOs
held by CEOs and the role of the CIO in the organization. While the present research examined the perceivers’ perspective, future research should explore the target’s perspective (CIO’s perspective). Adopting the CIO’s perspective might shed light on how stereotypes become enshrined and reinforced in the organizational structure through specific actions that CIOs take (due to stereotype threat) that makes their strategic aspirations even less likely.

5.1.6 The link between the CIO stereotype, strategy involvement and IT-enabled innovation

This dissertation argued the importance of including the CIO as a strategic partner within the organization and focused on the barriers that CIOs encounter in this endeavor – chief among them being the stereotypical beliefs ascribed to CIOs. A different line of reasoning is that CIOs are indeed unnecessary when it comes to setting strategic direction – either because they are personally ill-equipped (e.g., lacking appropriate skills and capabilities) or that their area of expertise is unimportant to the strategic functioning of the organization. That is, analogous to the paucity of women on corporate boards, why foment for membership without compelling reason? Although it was not empirically explored in this research, research does exist to shed light on this debate. For instance, it has long been argued that when CIOs are given the opportunity to act as strategic business partners, they can foster IT-enabled innovation by bridging the gap between CIOs and business managers in the firm (McKenney et al., 1997; Ward and Peppard 1996). More recently, CIOs have been seen as “liaisons” between the IT organization and the external environment and “act as an advocate for the IS function educating the organization on the strategic role of IT” (Carter et al. 2011). CIO involvement in strategy therefore can help CEOs make better decisions to support IT projects consistent with the firms’ business innovation needs. Organizations whose strategic orientation is differentiation (i.e., offering innovative products and
services) promote IT initiatives oriented towards the enhancement of new product development and customer intimacy (Banker et al. 2011). For example, IT initiatives in product development, such as collaborative tools, focus on enabling cross-functional integration among marketing, R&D, and engineering to develop original products (Pavlou and El Sawy 2006). IT initiatives in the supply chain, such as real-time intelligence and global visibility systems, focus on customer intimacy by dynamically adjusting to changes in customer needs (Rai et al. 2009). Also, IT initiatives in the apparel industry, such as data mining tools for business intelligence, can be used to personalize marketing efforts and identify products that meet seasonal changes in customer needs (Farrell et al. 2003). Despite myriad examples of how CIOs can be instrumental in developing strategic initiatives, the fact remains that, unless and until CIOs achieve representation on strategic councils, their contribution will remain moot. Therefore, another interesting venue for research is examining the link between the CIO stereotype, the CIO’s involvement in strategy and the propensity of the organization for IT-enabled business innovation.

5.1.7 Potential effects on students’ interest in MIS

The findings may also shed light on the ongoing concerns regarding enrolments in MIS programs. Research has shown that the stereotypes that people hold are crucial factors that influence their career choices (Holland 1997; Rosenbloom et al. 2008). Therefore, it is important that students have realistic perceptions of CIOs and their work because misleading representations can lead to twisted judgments in their professional interactions with these executives. For example, if CIOs are perceived to have fewer leadership qualities than their business counterparts and thus less likely to climb the corporate ladder, students may opt for other career choices. Prior studies have shown that consequences of negative leader evaluations include poorer candidates for career advancement, a lower probability of promotion to specific positions,
and a general exacerbation of the barriers to upward advancement (Morrison and von Glinow 1990; Powell and Butterfield 1997). This possible linkage between CIO stereotypes and career choices is another potentially rich avenue for future research.

5.1.8 Options to deal with negative stereotypes

Research (Carnegie and Napier 2010, p. 363-364) has shown that when minorities believe they are being stereotyped negatively, they have three options to deal with these negative perceptions: they can ignore the negative stereotype; leave the stereotyped group (e.g., leave the organization, group, etc.); or work to change the stereotype. The option of leaving the group may be virtually impossible (e.g., ethnic and gender groupings) or considered to be undesirable (e.g., occupational groupings where a considerable amount of effort has been invested in becoming a member). Ignoring the negative stereotype, or even accepting and playing up to it, may be acceptable if significant costs do not flow from this. But members of a group burdened with a negative stereotype are more likely, if they wish to enhance their social status, to work to change the stereotype. CIOs face the same set of alternatives. Future research needs to explore the means for CIOs to enhance their organizational status.

For instance, Heller (2013) presents different stories of CIOs who have embarked in the process of changing negative stereotypical beliefs ascribed to them and their IT function. Most of these CIOs have used three approaches: communication style, a value-added approach, and managing expectations. Communication style refers to recognizing the innate power of language. These CIOs have eliminated their usage of the technical jargon, borrowed metaphors directly from the business, downsized their standard reports, and even hired a communication specialist as a way of branding themselves and their units differently and more positively. A value-added approach refers to activities that convert IT performance directly to organizational outcomes.
Some of these CIOs strive in finding ways to bring new business to the organization (e.g., leverage relationships with other CIOs and develop a sales strategy plan). Managing expectations refers to the prior assessment of the business in relation to IT. For instance, newly appointed CIOs often spend more time in operational duties at the beginning of their appointments and slowly start increasing time spent on strategic initiatives. Although these are excellent advice, as earlier mentioned, these CIOs may be subtyped or perceived as “not real CIOs”, leaving the general negative stereotype of CIOs intact. Therefore, future research could then examine the branding literature in marketing theory (e.g., brand personality, brand attitudes) as a potential source of more powerful strategies for changing negative impressions of a brand or group membership, in this case, CIOs as the highest executives carrying the IT brand in their organizations.

5.2 Conclusion

Since the origin of the IT executive role in organizations, IS researchers have attempted to understand the barriers that CIOs face in their efforts to realize IT value for their organizations. One such challenge is the apparent disconnect between the burgeoning importance of information technology to the success of organizations and the relegation of CIOs to tactical rather than strategic roles in their organizations, thereby hindering the transformative power of IT as a competitive advantage. This dissertation tackles this disconnect finding that CIOs are caught up within a broadly shared and entrenched stereotype of IT professionals that views them as lacking leadership competencies. Specifically, this dissertation put forward the claim that CIOs may face a glass ceiling (similar to minorities groups) and that stereotypical beliefs limits (if not denies) them the opportunity to drive the organization forward in the use of IT. Four studies examined the content of these beliefs held by perceivers outside the IT profession and identified the contexts
within which these beliefs can cause biased decision-making concerning the role of CIOs. Taken as a whole, this dissertation empirically tests the long-held anecdotal assumption of a CIO stereotype and identifies biases that can cause inequality perceptions at strategic levels of the organization; specifically, the perception of CIOs as "the last among equals" or as unequal members of the C-suite appears to limit their strategic involvement in corporate decision-making. With its unique research lens, strong theoretical underpinnings and powerful methodology, this research contributes to the study of IT leadership and advances our understanding of the persistent 'perception gap' that has intrigued (and plagued) IS researchers and practitioners for a long time.
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Appendix A

The General Ethics Research Board (GREBB) Letters

Approval Letter

December 65, 2012

Ms. Paola Gonzalez-Manz
PhD Candidate
Queen’s School of Business
Queen’s University
Kingston, ON K7L 3N6

GREB Ref #: GBUS-368-12; Romeo # 6067608
Title: "GBUS-368-12 Perceptions of IT professionals: IT Stereotyping and the CEO-CIO Headlock"

Dear Ms. Gonzalez-Manz,

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "GBUS-368-12 Perceptions of IT professionals: IT Stereotyping and the CEO-CIO Headlock" for ethical compliance with the Tri-Council Guidelines (TCPS) and Queen’s ethics policies. In accordance with the Tri-Council Guidelines (article D 1.6) and Senate Terms of Reference (article G), your project has been cleared for one year. At the end of each year, the GREB will ask if your project has been completed and if not, what changes have occurred or will occur in the next year.

You are reminded of your obligation to advise the GREB, with a copy to your unit (REB), of any adverse event(s) that occur during this one year period (access this form at https://erci.services.queensu.ca/romeo_researcher/ and click Events - GREB Adverse Event Report). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To make an amendment, access the application at https://erci.services.queensu.ca/romeo_researcher/ and click Events - GREB Amendment to Approved Study Form. These changes will automatically be sent to the Ethics Coordinator, Gail Irving, at the Office of Research Services or irvingg@queensu.ca for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

Joan Stevenson, Ph.D.
Professor and Chair
General Research Ethics Board
Renewal Letter

December 03, 2013

Ms. Paola Gonzalez-Munoz
Ph.D. Candidate
Queen’s School of Business
Queen's University
Kingston, ON, K7L 3N6

GREB Romeo #: 6007608
Title: "GBUS-368-12 Perceptions of IT Professionals: IT Stereotyping and the CEO-CIO Headlock"

Dear Dr. Gonzalez-Munoz:

The General Research Ethics Board (GREB) has reviewed and approved your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from December 5, 2013. Prior to the next renewal date you will be sent a reminder memo and the link to ROMEO to renew for another year.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours. Report to GREB through either ROMEO Event Report or Adverse Event Report Form at http://www.queensu.ca/oro/researchethics/GeneralREB/forms.html.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes in study procedures or implementation of new aspects into the study procedures. Your request for protocol changes will be forwarded to the appropriate GREB reviewers as well as the GREB Chair. Please report changes to GREB through either ROMEO Event Reports or the Ethics Change Form at http://www.queensu.ca/oro/researchethics/GeneralREB/forms.html.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

Joan Stevenson, Ph.D.
Chair
General Research Ethics Board

c.: Dr. James McKeen, Faculty Supervisor
    Dr. Jane Webster, Chair, Unit REB
    Ms. Amy Marshall, i/o Research Office
Appendix B

Information and Consent Form

Study of Perceptions Concerning Different Professions

Information and Consent Form

This research is being conducted by Paola González, a PhD candidate at the School of Business, Queen’s University, Kingston, Ontario, Canada, for her doctoral dissertation under the supervision of Dr. James McKeen.

Purpose
The main purpose of the study is to explore and confirm the perceptions that individuals hold concerning different professions.

Task
This study will consist of a short questionnaire that takes less than 10 minutes to complete. In addition to some background information, participants will be asked to rate a candidate for a special committee and check a list of adjectives that best describes a professional occupation.

Risks and Participation
There are no known physical, psychological, social or economic risks associated with this survey and your participation is entirely voluntary. Your participation in this study is completely voluntary.

Information and Confidentiality
The only information we record about you is the answers you provide in the questionnaires. No other identifiable information is recorded. You are not obliged to answer any questions that you find objectionable or which make you feel uncomfortable.

Contact Information
You can contact the following parties for any concerns you might have:

1. Any questions concerning the study itself (including requests for summary findings) should be directed to members of the research team:
   • Paola González, PhD Candidate in MIS, Queen’s School of Business, phone: 613-533-2303, email: pgonzalez@business.queensu.ca
   • Dr. James McKeen, Professor Emeritus, Queen’s School of Business, phone: 613-533-2360, email: jmckeen@business.queensu.ca

2. Any ethical concerns regarding the conduct of this research should be directed to the following person:
   • Chair of the General Research Ethics Board, Queen’s University, phone: 613-533-6001, email: chair.GREB@queensu.ca

This study has been granted clearance according to the recommended principles of Canadian ethics guidelines, and Queen’s policies.

Please provide your signature as an indication that you have read and understood the information contained in this letter, that you have had any questions answered to your satisfaction, that you understand the expectations and requirements of the current study, and that you accept to participate in the study.

Signature: ___________________________ Date: ___________________________

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# Appendix C

**List of studies of organizational views of CIOs and organizational outcomes**

<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banker et al. (2011)</td>
<td>Archival data from large firms from two periods (1990–1993 and 2006)</td>
<td>CIO reporting structure with their strategic positioning (specifically, differentiation with a CIO–CEO reporting structure and cost leadership with a CIO–CFO reporting structure) will have superior future performance.</td>
</tr>
<tr>
<td>Chatterjee et al. (2001)</td>
<td>Event study to analyze the stock price behavior of firms announcing a newly created CIO position</td>
<td>Newly created CIO positions do indeed provoke positive reactions from the marketplace.</td>
</tr>
<tr>
<td>Chun and Mooney (2009)</td>
<td>Literature review to understand the evolution of the CIO role</td>
<td>CIOs who are deeply embedded in business organizations can help CEOs strategize and business unit leaders to implement strategies.</td>
</tr>
<tr>
<td>Earl and Feeny (2012)</td>
<td>Concluding remarks based on empirical findings from several interviews with CEOs and CIOs.</td>
<td>CEOs appear to be polarized between those who see IT as a strategic resource and those who see IT as a cost. Second, <em>the CIO’s role and actions are crucial in ensuring that IT is deployed for strategic advantage and that the IS function delivers value</em>. The CIO can and must add value, or IS will be seen as a problem instead of as a recognized strength.</td>
</tr>
<tr>
<td>Feeny et al. (1992)</td>
<td>Exploratory interviews with 14 CEO–CIO pairs in large U.K. firms</td>
<td>Linking the fit between CEO and CIO attributes to the quality of the CEO–CIO relationship, the authors find that a shared vision of the role of IT and acceptance of the CIO as a TMT member are essential.</td>
</tr>
<tr>
<td>Johnson and Lederer (2005)</td>
<td>Survey of 202 CEO-CIO pairs in U.S. firms.</td>
<td>Examining the impact of communication frequency and channel richness on CEO-CIO convergence (i.e. current and future roles of IT), the authors find that current role convergence predicts IS financial contribution.</td>
</tr>
<tr>
<td>Authors</td>
<td>Methodology</td>
<td>Findings</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>Lim et al. (2012)</td>
<td>Archival data based on a sample of large US firms</td>
<td>The contribution of IT capabilities to a firm's competitive advantage is much stronger in firms with powerful senior IT executives as they are the driving force that may ensure the continuous renewal of these capabilities.</td>
</tr>
<tr>
<td>Preston et al. (2008)</td>
<td>Survey of 174 CEO–CIO pairs in U.S. firms</td>
<td>Organizational climate, organizational support for IT, the CIO’s structural power, the CIO’s level of strategic effectiveness, and a strong CIO–TMT partnership influence the CIO’s level of strategic decision-making authority, which affects IT’s contribution to performance.</td>
</tr>
<tr>
<td>Saldanha and Krishnan (2011)</td>
<td>Archival data from 257 U.S. public firms</td>
<td>IT-enabled business innovation is more likely when the CIO reports to the Chief Executive Officer, has more interactions with the firm’s customers and is more involved in new product development.</td>
</tr>
<tr>
<td>Stephens et al. (1992)</td>
<td>In-depth case studies of 5 CIOs in U.S. firms.</td>
<td>The study finds that CIOs should be executives rather than functional managers. CIOs’ active participation in strategy planning can be bridge the gap between the IT group, the functional areas, and external entities.</td>
</tr>
<tr>
<td>Watson (1990)</td>
<td>Survey of 43 CIOs in Australian firms</td>
<td>Two-way communication between the CIO-CEO is critical for IS effectiveness. CIOs tend to scan sources that are close to the industry.</td>
</tr>
<tr>
<td>Wu et al. (2008)</td>
<td>A large-scale field survey, 121 firms.</td>
<td>CIO role effectiveness has been found to affect the firm’s ability to apply IT to support, shape, and enable value-chain activities.</td>
</tr>
</tbody>
</table>
Appendix D

Study 1 Demographics, details of instructions and procedures

Table D-1 Demographic statistics for the senior manager sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>CIO</th>
<th>IT professional</th>
<th>C-level executive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size ( n = 65 )</td>
<td>22</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Female</td>
<td>9 (42.9%)</td>
<td>9 (40.9%)</td>
<td>7 (30.4%)</td>
</tr>
<tr>
<td>- Male</td>
<td>12 (57.1%)</td>
<td>13 (59.1%)</td>
<td>15 (69.6%)</td>
</tr>
<tr>
<td>Firm size (number of employees):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Large (501 or more)</td>
<td>12 (57.1%)</td>
<td>14 (63.6%)</td>
<td>13 (56.5%)</td>
</tr>
<tr>
<td>- Medium (101 – 500)</td>
<td>6 (25.6%)</td>
<td>4 (18.2%)</td>
<td>2 (8.7%)</td>
</tr>
<tr>
<td>- Small (100 or fewer)</td>
<td>3 (14.3%)</td>
<td>4 (18.2%)</td>
<td>8 (34.8%)</td>
</tr>
<tr>
<td>Industry (level of IT)¹:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- High IT intensive</td>
<td>5 (23.8%)</td>
<td>2 (9.1%)</td>
<td>5 (21.7%)</td>
</tr>
<tr>
<td>- Medium IT intensive</td>
<td>14 (33.7%)</td>
<td>16 (27.3%)</td>
<td>11 (47.8%)</td>
</tr>
<tr>
<td>- Low IT intensive</td>
<td>2 (9.5%)</td>
<td>2 (9.1%)</td>
<td>7 (30.4%)</td>
</tr>
</tbody>
</table>

Note: Cell entries are the frequencies and the relative percentage in brackets

¹ Firm industries were classified into three categories: high IT intensive industries (e.g., banking and financial services, computers and electronics, and aerospace and engineering); low IT intensive industries (e.g., retail, metals and mining, and energy); and medium IT intensive industries (e.g., the remaining industries) (Kudyba and Diwan 2002)

Tables D-2.1 to D-2.4 Complete lists of the 34 attributes for the adjective list measure

<p>| Table D-2.1 Attributes stereotypic of CIOs and IT professionals labels (student sample) |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| N=                                           | CIOs 49                                      | IT professionals 47                          | Mean t-test                                   |
| Stereotypic attributes                       | Percent                                      | Mean                                         | Percent                                      | Mean                                         | t-test                                      |
| (rated by over 67% of respondents)           |                                               |                                              |                                               |                                              |                                             |
| (1) Resourceful                              | 82.2%                                        | 4.13                                         | 92.5%                                        | 4.21                                         | -1.773                                      |
| (2) Techy                                    | 80.5%                                        | 4.31                                         | 96.3%                                        | 4.85                                         | -2.68*                                      |
| (3) Detailed-oriented                        | 77.8%                                        | 4.22                                         | 100%                                         | 4.74                                         | -2.93**                                     |
| (4) Task-focused                             | 75%                                          | 3.86                                         | 77.4%                                        | 4.07                                         | 0.857                                       |
| (5) Introvert                                | 72.2%                                        | 3.81                                         | 77.7%                                        | 4.04                                         | -0.912                                      |
| (6) organized                                | 69%                                          | 3.81                                         | 74%                                          | 3.93                                         | -0.505                                      |
| (7) Innovative                               | 67.1%                                        | 3.82                                         | 85.2%                                        | 4.48                                         | -2.97**                                     |
| (8) Geek                                     | 67.1%                                        | 3.81                                         | 67.1%                                        | 3.81                                         | 0                                           |
| (9) Curious                                  | 50%                                          | 3.5                                          | 92.5%                                        | 4.37                                         | -3.82**                                     |
| (10) Determined                              | 61.1%                                        | 3.56                                         | 77.5%                                        | 3.89                                         | -1.12                                       |</p>
<table>
<thead>
<tr>
<th>Table D-2.1 Attributes stereotypic of CIOs and IT professionals labels</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N=</td>
<td>CIOs 49</td>
</tr>
<tr>
<td>Stereotypic attributes</td>
<td>Percent</td>
</tr>
<tr>
<td>(11) Nerdy (rated by below 67% of respondents)</td>
<td>63.9%</td>
</tr>
<tr>
<td>(12) Strategic</td>
<td>61.9%</td>
</tr>
<tr>
<td>(13) Persevering</td>
<td>50%</td>
</tr>
<tr>
<td>(14) Conservative</td>
<td>53.9%</td>
</tr>
<tr>
<td>(15) Reserved</td>
<td>47.2%</td>
</tr>
<tr>
<td>(16) Driven</td>
<td>41.6%</td>
</tr>
<tr>
<td>(17) Ambitious</td>
<td>38.9%</td>
</tr>
<tr>
<td>(18) Tactful</td>
<td>38.9%</td>
</tr>
<tr>
<td>(19) Enterprising</td>
<td>36.1%</td>
</tr>
<tr>
<td>(20) Enthusiastic</td>
<td>36.2%</td>
</tr>
<tr>
<td>(21) Assertive</td>
<td>33.4%</td>
</tr>
<tr>
<td>(22) Confident</td>
<td>33.4%</td>
</tr>
<tr>
<td>(23) Polished</td>
<td>33.4%</td>
</tr>
<tr>
<td>(24) Leader</td>
<td>33.3%</td>
</tr>
<tr>
<td>(25) Sociable</td>
<td>30.2%</td>
</tr>
<tr>
<td>(26) Outspoken</td>
<td>22.2%</td>
</tr>
<tr>
<td>(27) Charismatic</td>
<td>19.5%</td>
</tr>
<tr>
<td>(28) Talkative</td>
<td>19.5%</td>
</tr>
<tr>
<td>(29) Cool</td>
<td>19.4%</td>
</tr>
<tr>
<td>(30) Energetic</td>
<td>19.5%</td>
</tr>
<tr>
<td>(31) Dominant</td>
<td>16.7%</td>
</tr>
<tr>
<td>(32) Aggressive</td>
<td>13.9%</td>
</tr>
<tr>
<td>(33) Extrovert</td>
<td>13.9%</td>
</tr>
<tr>
<td>(34) Unambitious</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

| Table D-2.2 Attributes Stereotypic of CIOs and IT professionals Labels for Senior Manager Sample |
|---------------------------------------------------------------|---|
| N=                                                          | CIOs 22 | IT professionals 21 | Mean comparisons |
| Stereotypic attributes | Percent | Mean | Percent | Mean | t-test |
| (rated by over 67% of respondents) |  |
| (1) Techy | 85.8% | 4.2 | 95.5% | 4.7 | -1.828 |
| (2) Innovative | 80.9% | 4 | 54.6% | 3.5 | 2.018* |
| (3) Geek | 76.2% | 3.9 | 90.9% | 4.3 | -1.378 |
| (4) Detail-oriented | 76.2% | 3.95 | 81.8% | 4.4 | -1.575 |
| (5) Task-focused | 76.2% | 3.95 | 95.5% | 4.3 | -1.729 |
| (6) Curious | 71.4% | 3.6 | 63.7% | 3.9 | -0.910 |
| (7) Nerdy | 66.7% | 3.6 | 77.3% | 4.1 | -1.772 |
| (8) Introvert | 57.1% | 3.7 | 86.3% | 4 | -1.047 |

| (rated by below 67% of respondents) |  |
| (9) Persevering | 61.9% | 3.7 | 45.4% | 3.2 | 1.945 |
| (10) Resourceful | 61.9% | 3.6 | 63.6% | 3.6 | -0.064 |
| (11) Strategic | 61.9% | 3.7 | 18.1% | 2.7 | 3.001** |
| (12) Determined | 57.1% | 3.7 | 59.1% | 3.6 | .422 |
| (13) Confident | 42.8% | 3.7 | 50% | 3.4 | .901 |

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Table D-2.2 Attributes Stereotypic of CIOs and IT professionals Labels for Senior Manager Sample

<table>
<thead>
<tr>
<th>Stereotypic attributes</th>
<th>Percent 22</th>
<th>Mean</th>
<th>Percent 21</th>
<th>Mean</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>(14) Assertive</td>
<td>57.2%</td>
<td>3.4</td>
<td>22.7%</td>
<td>2.6</td>
<td>2.258*</td>
</tr>
<tr>
<td>(15) Ambitious</td>
<td>42.8%</td>
<td>3.5</td>
<td>22.7%</td>
<td>2.8</td>
<td>2.297*</td>
</tr>
<tr>
<td>(16) Enterprising</td>
<td>47.6%</td>
<td>3.4</td>
<td>45.4%</td>
<td>3</td>
<td>1.114</td>
</tr>
<tr>
<td>(17) Driven</td>
<td>42.8%</td>
<td>3.4</td>
<td>27.2%</td>
<td>3</td>
<td>1.437</td>
</tr>
<tr>
<td>(18) Organized</td>
<td>52.4%</td>
<td>3.6</td>
<td>54.4%</td>
<td>3.4</td>
<td>.518</td>
</tr>
<tr>
<td>(19) Outspoken</td>
<td>38.1%</td>
<td>3.2</td>
<td>22.7%</td>
<td>2.4</td>
<td>2.523*</td>
</tr>
<tr>
<td>(20) Aggressive</td>
<td>38.1%</td>
<td>3.1</td>
<td>9%</td>
<td>2.4</td>
<td>2.111*</td>
</tr>
<tr>
<td>(21) Dominant</td>
<td>38%</td>
<td>3.1</td>
<td>13.6%</td>
<td>2.8</td>
<td>3.197*</td>
</tr>
<tr>
<td>(22) Reserved</td>
<td>33.4%</td>
<td>3.1</td>
<td>63.6%</td>
<td>3.6</td>
<td>-1.841</td>
</tr>
<tr>
<td>(23) Tacitful</td>
<td>33.3%</td>
<td>3.1</td>
<td>13.6%</td>
<td>2.6</td>
<td>1.990</td>
</tr>
<tr>
<td>(24) Energetic</td>
<td>28.6%</td>
<td>3.1</td>
<td>18.1%</td>
<td>2.9</td>
<td>.912</td>
</tr>
<tr>
<td>(25) Conservative</td>
<td>42.8%</td>
<td>3</td>
<td>63.7%</td>
<td>3.8</td>
<td>-2.289*</td>
</tr>
<tr>
<td>(26) Talkative</td>
<td>33.8%</td>
<td>2.8</td>
<td>0%</td>
<td>2.3</td>
<td>1.948*</td>
</tr>
<tr>
<td>(27) Cool</td>
<td>33.4%</td>
<td>2.9</td>
<td>45.5%</td>
<td>2.9</td>
<td>-.012</td>
</tr>
<tr>
<td>(28) Enthusiastic</td>
<td>23.8%</td>
<td>2.9</td>
<td>36.3%</td>
<td>2.9</td>
<td>-.178</td>
</tr>
<tr>
<td>(29) Polished</td>
<td>14.3%</td>
<td>2.9</td>
<td>4.5%</td>
<td>2.3</td>
<td>2.456*</td>
</tr>
<tr>
<td>(30) Extrovert</td>
<td>19.1%</td>
<td>2.6</td>
<td>0%</td>
<td>1.7</td>
<td>3.177**</td>
</tr>
<tr>
<td>(31) Sociable</td>
<td>14.3%</td>
<td>2.6</td>
<td>9.1%</td>
<td>2.3</td>
<td>1.002</td>
</tr>
<tr>
<td>(32) Leader</td>
<td>4.8%</td>
<td>2.4</td>
<td>4.5%</td>
<td>2.3</td>
<td>.675</td>
</tr>
<tr>
<td>(33) Unambitious</td>
<td>9.5%</td>
<td>2</td>
<td>22.7%</td>
<td>2.6</td>
<td>-1.946</td>
</tr>
<tr>
<td>(34) Charismatic</td>
<td>4.8%</td>
<td>2</td>
<td>4.5%</td>
<td>1.9</td>
<td>.688</td>
</tr>
</tbody>
</table>

Table D-2.3 Stereotypic Attributes of CIOs and General C-level Labels for Student Sample

<table>
<thead>
<tr>
<th>Stereotypic attributes</th>
<th>Percent 49</th>
<th>Mean</th>
<th>Percent 43</th>
<th>Mean</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Resourceful</td>
<td>82.2%</td>
<td>4.13</td>
<td>88.5%</td>
<td>4.43</td>
<td>-3.085**</td>
</tr>
<tr>
<td>(2) Techy</td>
<td>80.5%</td>
<td>4.31</td>
<td>31.4%</td>
<td>3.11</td>
<td>5.244**</td>
</tr>
<tr>
<td>(3) Detailed-oriented</td>
<td>77.8%</td>
<td>4.22</td>
<td>68.6%</td>
<td>4.06</td>
<td>0.733</td>
</tr>
<tr>
<td>(4) Task-focused</td>
<td>75%</td>
<td>3.86</td>
<td>85.7%</td>
<td>4.14</td>
<td>-1.311</td>
</tr>
<tr>
<td>(5) Introvert</td>
<td>72.2%</td>
<td>3.81</td>
<td>11.5%</td>
<td>2.34</td>
<td>6.052**</td>
</tr>
<tr>
<td>(6) organized</td>
<td>69%</td>
<td>3.81</td>
<td>85.7%</td>
<td>4.26</td>
<td>-2.28*</td>
</tr>
<tr>
<td>(7) Innovative</td>
<td>67.1%</td>
<td>3.82</td>
<td>74.3%</td>
<td>3.91</td>
<td>-0.584</td>
</tr>
<tr>
<td>(8) Geek</td>
<td>67.1%</td>
<td>3.81</td>
<td>14.3%</td>
<td>2.63</td>
<td>5.355**</td>
</tr>
<tr>
<td>(9) Polished</td>
<td>33.4%</td>
<td>3.06</td>
<td>97.1%</td>
<td>4.4</td>
<td>-7.235**</td>
</tr>
<tr>
<td>(10) Leader</td>
<td>33.3%</td>
<td>3.03</td>
<td>97.1%</td>
<td>4.71</td>
<td>-8.250**</td>
</tr>
<tr>
<td>(11) Confident</td>
<td>33.4%</td>
<td>3.03</td>
<td>97.2%</td>
<td>4.8</td>
<td>-9.822**</td>
</tr>
<tr>
<td>(12) Strategic</td>
<td>61.9%</td>
<td>3.67</td>
<td>94.3%</td>
<td>4.54</td>
<td>-4.693**</td>
</tr>
<tr>
<td>(13) Determined</td>
<td>61.1%</td>
<td>3.56</td>
<td>94.3%</td>
<td>4.86</td>
<td>-5.361**</td>
</tr>
<tr>
<td>(14) Ambitious</td>
<td>38.9%</td>
<td>3.19</td>
<td>94.3%</td>
<td>4.77</td>
<td>-7.715**</td>
</tr>
<tr>
<td>(15) Dominant</td>
<td>16.7%</td>
<td>2.56</td>
<td>94.3%</td>
<td>4.34</td>
<td>-8.638**</td>
</tr>
<tr>
<td>(16) Driven</td>
<td>41.6%</td>
<td>3.42</td>
<td>94.3%</td>
<td>4.63</td>
<td>-5.861**</td>
</tr>
<tr>
<td>(17) Assertive</td>
<td>33.4%</td>
<td>2.94</td>
<td>88.6%</td>
<td>4.31</td>
<td>-6.325**</td>
</tr>
<tr>
<td>(18) Charismatic</td>
<td>19.5%</td>
<td>2.67</td>
<td>88.6%</td>
<td>4.43</td>
<td>-8.885**</td>
</tr>
<tr>
<td>Stereotypic attributes</td>
<td>Percent</td>
<td>Mean</td>
<td>Percent</td>
<td>Mean</td>
<td>t-test</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------</td>
<td>------</td>
<td>---------</td>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>(19) Persevering</td>
<td>50%</td>
<td>3.44</td>
<td>88.6%</td>
<td>4.26</td>
<td>-4.308**</td>
</tr>
<tr>
<td>(20) Enterprising</td>
<td>36.1%</td>
<td>3.22</td>
<td>85.7%</td>
<td>4.2</td>
<td>-5.055**</td>
</tr>
<tr>
<td>(21) Extrovert</td>
<td>13.9%</td>
<td>2.56</td>
<td>82.9%</td>
<td>4.14</td>
<td>-7.478**</td>
</tr>
<tr>
<td>(22) Sociable</td>
<td>30.2%</td>
<td>3.03</td>
<td>82.9%</td>
<td>4.17</td>
<td>-6.037**</td>
</tr>
<tr>
<td>(23) Tactful</td>
<td>38.9%</td>
<td>3.28</td>
<td>80%</td>
<td>4.26</td>
<td>-5.172**</td>
</tr>
<tr>
<td>(24) Enthusiastic</td>
<td>36.2%</td>
<td>3.14</td>
<td>74.3%</td>
<td>4.23</td>
<td>-5.074**</td>
</tr>
<tr>
<td>(25) Energetic</td>
<td>19.5%</td>
<td>2.75</td>
<td>77.2%</td>
<td>4.11</td>
<td>-6.732</td>
</tr>
<tr>
<td>(26) Outspoken</td>
<td>22.2%</td>
<td>2.86</td>
<td>77.2%</td>
<td>4.09</td>
<td>-5.397**</td>
</tr>
<tr>
<td>(27) Aggressive</td>
<td>13.9%</td>
<td>2.5</td>
<td>77.1%</td>
<td>4.11</td>
<td>-7.793**</td>
</tr>
<tr>
<td>(28) Talkative</td>
<td>19.5%</td>
<td>2.69</td>
<td>77.1%</td>
<td>4.03</td>
<td>-6.205**</td>
</tr>
<tr>
<td>(29) Curious</td>
<td>50%</td>
<td>3.5</td>
<td>68.5%</td>
<td>4.03</td>
<td>-2.158*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(rated by below 67% of respondents)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(30) Nerdy</td>
<td>63.9%</td>
<td>3.78</td>
<td>11.4%</td>
<td>2.71</td>
<td>5.786**</td>
</tr>
<tr>
<td>(31) Conservative</td>
<td>53.9%</td>
<td>3.75</td>
<td>20%</td>
<td>2.86</td>
<td>4.556**</td>
</tr>
<tr>
<td>(32) Reserved</td>
<td>47.2%</td>
<td>3.39</td>
<td>5.7%</td>
<td>2.34</td>
<td>5.619**</td>
</tr>
<tr>
<td>(33) Cool</td>
<td>19.4%</td>
<td>2.69</td>
<td>51.4%</td>
<td>3.74</td>
<td>-4.724**</td>
</tr>
<tr>
<td>(34) Unambitious</td>
<td>11.1%</td>
<td>2.31</td>
<td>0%</td>
<td>1.31</td>
<td>4.977**</td>
</tr>
</tbody>
</table>

**Table D-2.3 Stereotypic Attributes of CIOs and General C-level Labels for Student Sample**

N= 49

Mean comparisons
Table D-2.4 Stereotypic attributes of CIOs and general C-level Labels (senior Manager Sample)

<table>
<thead>
<tr>
<th>Stereotypic attributes</th>
<th>Percent (rated by over 67% of respondents)</th>
<th>Mean</th>
<th>Percent (rated by below 67% of respondents)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CIOs 22</td>
<td>C-level 22</td>
<td>Mean comparisons</td>
<td></td>
</tr>
<tr>
<td>(1) Techy</td>
<td>85.8%</td>
<td>4.2</td>
<td>8.7%</td>
<td>2.5</td>
</tr>
<tr>
<td>(2) Innovative</td>
<td>80.9%</td>
<td>4</td>
<td>39.1%</td>
<td>3.4</td>
</tr>
<tr>
<td>(3) Geek</td>
<td>76.2%</td>
<td>3.9</td>
<td>8.7%</td>
<td>2.2</td>
</tr>
<tr>
<td>(4) Detail-oriented</td>
<td>76.2%</td>
<td>3.95</td>
<td>43.4%</td>
<td>3.3</td>
</tr>
<tr>
<td>(5) Task-focused</td>
<td>76.2%</td>
<td>3.95</td>
<td>55.5%</td>
<td>3.6</td>
</tr>
<tr>
<td>(6) Curious</td>
<td>71.4%</td>
<td>3.6</td>
<td>56.5%</td>
<td>3.5</td>
</tr>
<tr>
<td>(7) Nerdy</td>
<td>66.7%</td>
<td>3.6</td>
<td>4.3%</td>
<td>2.1</td>
</tr>
<tr>
<td>(8) Ambitious</td>
<td>42.8%</td>
<td>3.5</td>
<td>100%</td>
<td>4.7</td>
</tr>
<tr>
<td>(9) Assertive</td>
<td>57.2%</td>
<td>3.4</td>
<td>100%</td>
<td>4.7</td>
</tr>
<tr>
<td>(10) Confident</td>
<td>42.8%</td>
<td>3.7</td>
<td>100%</td>
<td>4.7</td>
</tr>
<tr>
<td>(11) Driven</td>
<td>42.8%</td>
<td>3.4</td>
<td>95.7%</td>
<td>4.6</td>
</tr>
<tr>
<td>(12) Leader</td>
<td>4.8%</td>
<td>2.4</td>
<td>91.3%</td>
<td>4.5</td>
</tr>
<tr>
<td>(13) Resourceful</td>
<td>61.9%</td>
<td>3.6</td>
<td>91.3%</td>
<td>4.2</td>
</tr>
<tr>
<td>(14) Strategic</td>
<td>61.9%</td>
<td>3.7</td>
<td>91.3%</td>
<td>4.5</td>
</tr>
<tr>
<td>(15) Determined</td>
<td>57.1%</td>
<td>3.7</td>
<td>91.3%</td>
<td>4.4</td>
</tr>
<tr>
<td>(16) Persevering</td>
<td>61.9%</td>
<td>3.7</td>
<td>87%</td>
<td>4.1</td>
</tr>
<tr>
<td>(17) Energetic</td>
<td>28.6%</td>
<td>3.1</td>
<td>82.6%</td>
<td>4.2</td>
</tr>
<tr>
<td>(18) Dominant</td>
<td>38.1%</td>
<td>3.2</td>
<td>78.3%</td>
<td>4.1</td>
</tr>
<tr>
<td>(19) Enterprising</td>
<td>47.6%</td>
<td>3.4</td>
<td>78.2%</td>
<td>4.1</td>
</tr>
<tr>
<td>(20) Polished</td>
<td>14.3%</td>
<td>2.9</td>
<td>73.9%</td>
<td>4</td>
</tr>
<tr>
<td>(21) Sociable</td>
<td>14.3%</td>
<td>2.6</td>
<td>73.9%</td>
<td>4</td>
</tr>
<tr>
<td>(22) Charismatic</td>
<td>4.8%</td>
<td>2</td>
<td>69.5%</td>
<td>4.7</td>
</tr>
</tbody>
</table>

(23) Introvert          | 57.1%                                     | 3.7   | 8.7%                                       | 2.4  | 4.344** |
(24) Organized          | 52.4%                                     | 3.6   | 65.2%                                      | 3.7  | -4.45   |
(25) Outspoken          | 38.1%                                     | 3.2   | 60.8%                                      | 3.9  | -2.133* |
(26) Aggressive         | 38%                                       | 3.1   | 65.2%                                      | 3.8  | -2.226* |
(27) Reserved           | 33.4%                                     | 3.1   | 17.4%                                      | 2.8  | 1.503   |
(28) Tactful            | 33.3%                                     | 3.1   | 43.4%                                      | 3.5  | -1.350  |
(29) Conservative       | 42.8%                                     | 3     | 34.8%                                      | 3    | .012    |
(30) Talkative          | 33.8%                                     | 2.8   | 47.8%                                      | 3.3  | -1.864  |
(31) Cool               | 33.4%                                     | 2.9   | 52.1%                                      | 3.6  | -2.465* |
(32) Enthusiastic       | 23.8%                                     | 2.9   | 65.2%                                      | 3.8  | -4.044**|
(33) Extrovert          | 19.1%                                     | 2.6   | 60.8%                                      | 3.7  | -4.103**|
(34) Unambitious        | 9.5%                                      | 2     | 0                                          | 1.3  | 2.989** |
D-3 Survey Instructions

Section I: Shared Beliefs
Organizations are composed of many different professionals about whom people in general have some knowledge. In fact, the ease with which organizational members form relatively well-defined impressions about their co-workers, managers, subordinate greatly simplifies their interactions at the workplace. On many occasions, either through hearsay or direct contact, we find out something about the impressions that people in general have about different professional groups. In this study, you will be asked to give your opinion about what people in general think about a professional group. Naturally, the impressions that people in general have about social groups may or may not reflect your personal beliefs. So, please give your answers based on what you know to be the occupational shared beliefs people in general have about those professional groups, whether or not you believe those ideas to be true.

Please take a minute to briefly list the first thoughts (e.g., traits, behaviors, attributes, characteristics) that come to your mind when you think of a typical Chief Information Officers (CIOs)/IT professionals/a C-level executive in general. Please write down one thing per line, but only as many or as few as come to mind.

Section II: Please check what you think a CIO might be like on each of the following characteristics (The list of 34 traits followed this instruction)

D-4 Factor Analysis Procedure
Communalities were high (i.e., an average of .70) and each factor was overdetermined, suggesting that the sample sizes was sufficiently large to conduct EFA (Fabrigar and Wegener 2011). The common factor model was fitted to the data using iterative principal factor extraction. The factors were rotated using the Oblimin with Kaiser Normalization method. Oblique rotations seem particularly warranted when analyzing stereotype structure because they do not import the assumption that extracted factors are unrelated (Deaux et al. 1985). As recommended by Fabrigar and Wegener (2011), multiple methods were used to decide how many factors to retain: the scree plot, the parallel analysis method, and model fit. These methods suggested the retention of two factors in the final model; these accounted for 52.81 percent of the observed variance. Items with factor loadings of less than 0.30 were not examined during the interpretive phase of the analysis. Items that cross-loaded on other factors were not included in this analysis.
Determining the number of factors:

1. **Scree test:** This scree test is based on eigenvalues from the reduced matrix.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>1</td>
<td>14.709</td>
<td>43.262</td>
</tr>
<tr>
<td>2</td>
<td>3.246</td>
<td>9.549</td>
</tr>
<tr>
<td>3</td>
<td>1.545</td>
<td>4.544</td>
</tr>
<tr>
<td>4</td>
<td>1.405</td>
<td>4.131</td>
</tr>
<tr>
<td>5</td>
<td>1.274</td>
<td>3.747</td>
</tr>
<tr>
<td>6</td>
<td>1.133</td>
<td>3.353</td>
</tr>
<tr>
<td>7</td>
<td>.963</td>
<td>2.833</td>
</tr>
<tr>
<td>8</td>
<td>.889</td>
<td>2.614</td>
</tr>
</tbody>
</table>

![Scree Plot](image)

After plotting the eigenvalues from the reduced correlation matrix, the last major drop seemed to happen at 3. From this factor on, the line is almost flat, meaning that each successive factor is accounting for smaller and smaller amounts of the total variance. Thus, it follows only this method, I would suggest that a two-factor is most appropriate (i.e., “The appropriate number of
factors corresponds to the number of eigenvalues prior to the last major drop in the plot” pag. 109).

2. **Parallel analysis:**

Comparing the obtained eigenvalues from the reduced matrix with the random eigenvalues from the parallel analysis, the two largest obtained eigenvalues from our actual data set exceed the random eigenvalues from the parallel analysis based on either the mean values or the 95th percentile values. Therefore, the parallel analysis suggests the same number of factors as the scree plot in this case.

3. **Model Fit:** This analysis was conducted using Maximum Likelihood with Oblimin rotation. The RSMEA results were as follows:

<table>
<thead>
<tr>
<th>Factors</th>
<th>Chi-square &amp; df</th>
<th>RMSEA</th>
<th>CI</th>
<th>Δ Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1053.193 df=527</td>
<td>0.1015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>842.502 df=494</td>
<td>0.085</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>750.257 df=462</td>
<td>0.0802</td>
<td>0.0048</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>653.783 df=431</td>
<td>0.073</td>
<td>0.0072</td>
<td></td>
</tr>
</tbody>
</table>

Based on the criteria to identify the appropriate number of factors, the RSMEA analysis indicates the following:

A marginal meaningful improvement until Factor 2 (Δ = .016). Above this factor, the differences were less than .010 which rarely constitutes meaningful improvement in model fit. The model improvement kept relatively constant after the two-factor model.

---

19 The appropriate number of factors is that model in the sequence that ideally: a) fits the data well, b) fits substantially better than a model with one less factor, and c) does not fit substantially worse than a model with one more factor.
Results for a two-factor model with a Maximum likelihood with direct quartimin rotation (direct oblimin with tuning parameter $\gamma = 0$).

| AD20 Leader | 0.871 | 0.028 |
| AD5 Charismatic | 0.790 | 0.024 |
| AD2 Ambitious | 0.778 | 0.024 |
| AD25 Polished | 0.777 | 0.090 |
| AD28 Sociable | 0.771 | -0.067 |
| AD6 Confident | 0.759 | -0.048 |
| AD12 Driven | 0.755 | 0.184 |
| AD16 Extrovert | 0.755 | -0.220 |
| AD11 Dominant | 0.739 | -0.086 |
| AD13 Energetic | 0.736 | -0.031 |
| AD3 Assertive | 0.724 | -0.126 |
| AD31 Talkative | 0.700 | 0.099 |
| AD19 Introvert | -0.688 | 0.179 |
| AD23 Outspoken | 0.687 | -0.047 |
| AD21 Nerdy | -0.680 | 0.293 |
| AD1 Aggressive | 0.677 | -0.249 |
| AD29 Strategic | 0.670 | 0.306 |
| AD9 Determined | 0.656 | 0.390 |
| AD17 Geek | -0.652 | 0.284 |
| AD33 Techy | -0.646 | 0.437 |
| AD15 Enthusiastic | 0.631 | 0.150 |
| AD14 Enterprising | 0.629 | 0.167 |
| AD34 Unambitious | -0.605 | -0.065 |
| AD26 Reserved | -0.582 | 0.101 |
| AD30 Tactful | 0.567 | 0.228 |
| AD7 Geek | -0.547 | 0.037 |
| AD24 Perserving | 0.518 | 0.403 |
| AD27 Resourceful | 0.397 | 0.380 |
| AD22 Organized | 0.377 | 0.366 |
| AD4 Conservative | -0.308 | 0.029 |
| AD10 Detail-oriented | -0.129 | 0.661 |
| AD18 Innovative | 0.174 | 0.656 |
| AD32 Task-focused | 0.047 | 0.518 |
| AD3 Curious | 0.056 | 0.434 |

Extraction Method: Maximum Likelihood.

a. 2 factors extracted. 5 iterations required.
D-5 Mean differences for demographic variables across the groups

One-way ANOVAs were conducted for level IT (e.g., low, medium, high), firm size (e.g., small, medium, large), and gender for the IT professional, CIO, and C-level groups. There were no statistically differences in leadership and problem solving scores across the demographic variables within each group. Please refer to the following tables for details.

| Table D 5-1 Analysis of variance for leadership listed by industry IT level across the groups |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| **Group** | **Low** | **Medium** | **High** | **df** | **MSS** | **F** |
| CIO | n=2 3.1 (.48) | n=13 2.9 (.38) | n=6 3.1 (.21) | 2 | .112 | .913 |
| IT Professional | n=4 2.5 (.75) | n=16 2.5 (.46) | n=2 2.1 (.19) | 2 | .149 | .565 |
| C-level | n=6 3.9 (.25) | n=12 2.1 (.31) | n=5 4.1 (.21) | 2 | .068 | .925 |

| Table D 5-2 Analysis of variance for leadership listed by firm size across the groups |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| **Group** | **Small** | **Medium** | **Large** | **df** | **MSS** | **F** |
| CIO | n=2 4.1 (.53) | n=6 4 (.53) | n=15 3.6 (.57) | 2 | .095 | .765 |
| IT Professional | n=4 2.6 (.77) | n=4 2.6 (.54) | n=14 2.4 (.44) | 2 | .070 | .256 |
| C-level | n=8 3.9 (.37) | n=2 4.2 (.32) | n=13 4 (.20) | 2 | .082 | 1.142 |

| Table D 5-3 Analysis of Variance for Leadership listed by Gender across the groups |
|----------------------|----------------------|----------------------|----------------------|
| **Group** | **Female** | **Male** | **t-test** |
| CIO | n=9 3 (.40) | n=12 3 (.33) | -.016 |
| IT Professional | n=10 2.4 (.38) | n=12 2.5 (.60) | -.437 |
| C-level | n=7 4 (.28) | n=16 4 (.27) | -.079 |
### Table D 5-4 Analysis of Variance for problem solving listed by Gender across the groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Female</th>
<th>Male</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIO</td>
<td>n=9 3.9 (.61)</td>
<td>n=12 3.9 (.57)</td>
<td>.349</td>
</tr>
<tr>
<td>IT Professional</td>
<td>n=10 3.8 (.64)</td>
<td>n=12 4.2 (.58)</td>
<td>-1.562</td>
</tr>
<tr>
<td>C-level</td>
<td>n=7 3.4 (.67)</td>
<td>n=16 3.5 (.58)</td>
<td>-.260</td>
</tr>
</tbody>
</table>

### Table D 5-5 Analysis of Variance for Problem-solving listed by Industry IT level across the groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>df</th>
<th>MSS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIO</td>
<td>n=2 4.1 (.53)</td>
<td>n=13 4 (.53)</td>
<td>n=6 3.6 (.57)</td>
<td>2</td>
<td>.655</td>
<td>.135</td>
</tr>
<tr>
<td>IT Professional</td>
<td>n=4 4.2 (.31)</td>
<td>n=16 4 (.69)</td>
<td>n=2 3.5 (.35)</td>
<td>2</td>
<td>.332</td>
<td>.820</td>
</tr>
<tr>
<td>C-level</td>
<td>n=6 3.7 (.70)</td>
<td>n=12 3.4 (.54)</td>
<td>n=5 3.4 (.65)</td>
<td>2</td>
<td>.158</td>
<td>.425</td>
</tr>
</tbody>
</table>

### Table D 6-6 Analysis of Variance for Problem-solving listed by Firm Size across the groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>df</th>
<th>MSS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIO</td>
<td>n=2 4.5 (.35)</td>
<td>n=6 3.8 (.71)</td>
<td>n=13 3.8 (.51)</td>
<td>2</td>
<td>.414</td>
<td>1.296</td>
</tr>
<tr>
<td>IT Professional</td>
<td>n=4 4.1 (.85)</td>
<td>n=4 4.3 (.31)</td>
<td>n=14 3.9 (.64)</td>
<td>2</td>
<td>.256</td>
<td>.776</td>
</tr>
<tr>
<td>C-level</td>
<td>n=8 3.4 (.44)</td>
<td>n=2 3.5 (.98)</td>
<td>n=13 3.5 (.59)</td>
<td>2</td>
<td>.069</td>
<td>.175</td>
</tr>
</tbody>
</table>


Appendix E

Study 2 Demographics, details of instructions and procedures

Table E-1 Demographic statistic for senior manager Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>CFO</th>
<th>CIO</th>
<th>CMO</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size n</td>
<td>20</td>
<td>20</td>
<td>19</td>
<td>59</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Female</td>
<td>6 (30%)</td>
<td>5 (25%)</td>
<td>11 (58%)</td>
<td>22 (37%)</td>
</tr>
<tr>
<td>- Male</td>
<td>14 (70%)</td>
<td>15 (75%)</td>
<td>8 (42%)</td>
<td>37 (63%)</td>
</tr>
<tr>
<td>Firm size (number of employees):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Large (501 or more)</td>
<td>10 (60%)</td>
<td>12 (70%)</td>
<td>13 (68%)</td>
<td>39 (66%)</td>
</tr>
<tr>
<td>- Medium (101 – 500)</td>
<td>8 (40%)</td>
<td>6 (30%)</td>
<td>6 (32%)</td>
<td>20 (34%)</td>
</tr>
<tr>
<td>- Small (100 or fewer)</td>
<td>2</td>
<td>2</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Industry (level of IT):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- High IT intensive</td>
<td>10 (30%)</td>
<td>7 (21%)</td>
<td>4 (21%)</td>
<td>14 (23.7%)</td>
</tr>
<tr>
<td>- Medium IT intensive</td>
<td>6 (40%)</td>
<td>12 (40%)</td>
<td>9 (31.5%)</td>
<td>22 (37.3%)</td>
</tr>
<tr>
<td>- Low IT intensive</td>
<td>4 (30%)</td>
<td>4 (40%)</td>
<td>7 (48.5%)</td>
<td>23 (39%)</td>
</tr>
</tbody>
</table>

E-2 Survey Instructions

Since becoming CEO of PostPak – a large distribution company headquartered in Mississauga – Chris Bedders has met every Monday morning with the company’s three C-level officers – the Chief Financial Officer (CFO), the Chief Information Officer (CIO) and the Chief Marketing Officer (CMO). Based on many such meetings in this and in former companies, Chris casually observed, “It is uncanny the way all CFOs seem the same, as do all CIOs and all CMOs”. More emphatically, Chris declared, “Give me 3 minutes in a room and I’ll bet I can tell you who is the CFO, who is the CIO, and who is the CMO. As a student in a top Commerce program, I wonder if you agree with Chris’ statement. Hence, I would like to learn about your own impressions about one of these three C-level executives – the CIO/CMO/CFO. I have described some of the main responsibilities of the CIO for you below.

“Chief Information Officers (CIOs)” support the organization’s competitive strategy by overseeing all aspects of information technology (IT) and systems within the organization. More specifically, CIOs:

- Establish IT departmental goals, operating procedures, and structure
- Develop and monitor IT budgets
- Acquire and maintain major information systems
• Keep current with trends in the IT industry
• Manage relationships with vendors and partner organizations

I ask you to rate the personality traits that best describe “Chief Information Officers (CIOs)”

You will find a number of personality traits next which I deem important in assessing/judging any of these C-level executives. Please rate these statements according to the 5-point Likert scale, ranging from “strongly disagree” to “strongly agree” Thanks!
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIOs can handle complex problems</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs need things explained only once</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs go straight for the goal</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs are the first to act</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs are comfortable in unfamiliar situations</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs have excellent ideas</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs respect the opinions of others</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs put people under pressure</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs formulate ideas clearly</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs see humor in situations</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs look at the facts</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs live in a world of their own</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs rarely complain</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs choose their words with care</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs do things that others find strange</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs complete tasks successfully</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs keep their promises</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs are able to cooperate with others</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs want to control the conversation</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs try to lead others</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs engage in discussions</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs automatically take charge</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs come up with good solutions</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs are polite with strangers</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs are effective communicators</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs think highly of themselves</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs have large incomes</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CIOs want to increase their knowledge</td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neither Agree nor Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>CIOs believe that they are important</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs like to organize things</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs act comfortably with others</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs remain calm under pressure</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs love to read challenging material</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs readily overcome setbacks</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs keep in the background</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs think quickly</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs try to outdo others</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs are not embarrassed easily</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs feel at ease with people</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs handle tasks smoothly</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs take the initiative</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs express themselves easily</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs dislike competing with others</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs know the answers to many questions</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs understand people who think differently</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs are quick to correct others</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs have a vivid imagination</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs are quick to understand things</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs are not easily bothered by things</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs do things by the book</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs are open to change</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs put a new perspective on things</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs pay attention to details</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs lay down the law to others</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs are exacting in their work</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>CIOs acknowledge others’ accomplishments</td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neither Agree nor Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>------------------</td>
<td>----------</td>
<td>---------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>CIOs stick to the rules</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs carry the conversation to a higher level</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs can see different points of view</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs find political discussions interesting</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs challenge others’ point of view</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs respect authority</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs come up with alternatives</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs know how to convince others</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs are skilled in handling social situations</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs don’t talk a lot</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs are not easily affected by their emotions</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs experience very few emotional highs and lows</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs follow through on their commitments</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CIOs enjoy thinking about things</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

E-3 Discriminant analysis’ assumptions

Student sample
The demographic variables “gender” (chi-square = 0.425, df = 2, p = 0.809), “class year” (chi-square = 8.03, df = 6, p = 0.236), and “concentration area” (chi-square = 17.1, df = 16, p = 0.378) were distributed similarly across treatment groups. Therefore, we can conclude that the sample comes from a similar population.

Of a total of 252 cases, 5 cases (i.e., 2% of the sample) showed repetitive response patterns (i.e., all 1’s, all 2’s, etc.) and were removed reducing the sample to 247. Then, the 70 predictors were examined for missing values, fit within their distributions and the assumptions of multivariate
analysis. These variables were examined separately for the cases in each group (CFO = 82; CIO= 84; CMO= 81).

Following Tabachnick and Fidel’s (2004) procedure to identify outliers, any response for any of the 50 items with a standardized score in excess of 3.29 (p < .001, two-tailed test) was considered an outlier and replaced with a “blank” entry. There were 24 outliers out of the 17,290 responses representing 0.14% of the sample. After removing these outliers, we confirmed normality in each item distribution by checking for significant skewness and kurtosis using a conservative Z score of 3.29.

We then examined the assumption of multicollinearity or singularity on the remaining 247 cases. Tabachnick and Fidel (2004) suggest a critical value for multicollinearity as any bivariate correlation exceeding 0.70. The two largest bivariate correlations in the sample were .693 and .694. Since they both involved the same item, this item was removed. The final sample consisted of 69 predictors (i.e., items) and 247 cases.

**Senior manager sample**

The organizational variables such “size” (chi-square = 4.04, df = 4, p = 0.671), and “industry type” (chi-square = 31.6, df = 4, p = 0.789) were equally distributed across treatment groups; more than 60% of the respondents were from large organizations. As for the demographic variables such as “managerial position” (chi-square = 2.61, df = 4, p = 0.626), “work experience” (chi-square = 1.96, df = 4, p = 0.743), “gender” (chi-square = 5.2, df = 2, p = 0.074) and “age” (chi-square = 9.71, df = 4, p = 0.056) were also proportionally distributed across the groups; however, more than 60% of the respondents had more than 10 years of experience. The distribution of work experience was 52% of the respondents reported to have marketing experience, 29% had finance experience and the remaining 19 had IT experience.

Of a total of 62 surveys completed, 59 surveys were included in the analysis because the respondents had the role of senior executive that was assigned. That is, by chance a CFO was asked to rate a CFO which would have reflected a self-description of his or her role. Our study examines perceptions of others and not self-perceptions. Then, the 18 predictors were examined for missing values, fit within their distributions and the assumptions of multivariate analysis. These variables were examined separately for the cases in each group (CFO = 20; CIO= 20; CMO= 19).
Table E-4.1 Mean comparison of items and constructs by group – senior manager sample

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items/Variables</th>
<th>CIO</th>
<th>CFO</th>
<th>CMO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Function 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness/creativity</td>
<td>CxOs have a vivid imagination</td>
<td>2.85</td>
<td>2.2</td>
<td>4.26</td>
</tr>
<tr>
<td></td>
<td>CxOs put a new perspective on things</td>
<td>3.3</td>
<td>2.85</td>
<td>3.95</td>
</tr>
<tr>
<td></td>
<td>CxOs are open to change</td>
<td>3.05</td>
<td>2.65</td>
<td>3.05</td>
</tr>
<tr>
<td></td>
<td>CxOs understand people who think differently</td>
<td>2.65</td>
<td>2.2</td>
<td>3.53</td>
</tr>
<tr>
<td></td>
<td>CxOs can see different points of view</td>
<td>3.1</td>
<td>3.25</td>
<td>3.68</td>
</tr>
<tr>
<td></td>
<td>CxOs do things by the book <em>(reverse item)</em></td>
<td>3.55</td>
<td>4.25</td>
<td>2.53</td>
</tr>
<tr>
<td>Sociability</td>
<td>CxOs see humor in situations</td>
<td>2.85</td>
<td>2.7</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CxOs are skilled in handling social situations</td>
<td>2.6</td>
<td>2.5</td>
<td>4.53</td>
</tr>
<tr>
<td></td>
<td>CxOs act comfortably with others</td>
<td>2.95</td>
<td>3.2</td>
<td>4.32</td>
</tr>
<tr>
<td>Communication</td>
<td>CxOs express themselves easily</td>
<td>2.95</td>
<td>3</td>
<td>4.21</td>
</tr>
<tr>
<td></td>
<td>CxOs are effective communicators</td>
<td>2.9</td>
<td>2.9</td>
<td>4.26</td>
</tr>
<tr>
<td></td>
<td>CxOs don’t talk a lot <em>(reverse item)</em></td>
<td>2.7</td>
<td>3.1</td>
<td>4.32</td>
</tr>
<tr>
<td><strong>Function 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assertiveness</td>
<td>CxOs keep in the background <em>(reverse item)</em></td>
<td>2.95</td>
<td>2.8</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td>CxOs automatically take charge</td>
<td>3.05</td>
<td>3.6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CxOs believe that they are important</td>
<td>4.25</td>
<td>4.65</td>
<td>4.63</td>
</tr>
<tr>
<td>Dominance</td>
<td>CxOs lay down the law to others</td>
<td>3.15</td>
<td>3.8</td>
<td>2.79</td>
</tr>
<tr>
<td></td>
<td>CxOs try to outdo others</td>
<td>3.05</td>
<td>2.85</td>
<td>3.74</td>
</tr>
<tr>
<td></td>
<td>CxOs put people under pressure</td>
<td>3.1</td>
<td>4.10</td>
<td>3.63</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses.

Table E-4.2 Absolute mean scores and comparisons of the constructs derived from the 18 variables between the CIO, CFO and CMO groups – student sample

<table>
<thead>
<tr>
<th>Construct</th>
<th>Comparison 1: CIO and CFO</th>
<th>Comparison 2: CIO and CMO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CIO N = 84</td>
<td>CFO N = 82</td>
</tr>
<tr>
<td><strong>Function 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness/creativity</td>
<td>3.3 (.60)</td>
<td>2.7 (.67)</td>
</tr>
<tr>
<td>Sociability</td>
<td>3.1 (.66)</td>
<td>3.1 (.64)</td>
</tr>
<tr>
<td>Communication</td>
<td>3.2 (.71)</td>
<td>3.5 (.67)</td>
</tr>
<tr>
<td><strong>Function 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.1 (.49)</td>
<td>4 (.54)</td>
</tr>
<tr>
<td>Dominance</td>
<td>3.2 (.62)</td>
<td>4 (.46)</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses.
* p < .05, ** p < .01.
Table E-4.3 Absolute mean scores and comparisons of the constructs derived from the 18 variables between the CIO, CFO and CMO groups – Senior manager sample

<table>
<thead>
<tr>
<th>Construct</th>
<th>Comparison 1: CIO and CFO</th>
<th>Comparison 2: CIO and CMO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 20</td>
<td>N = 20</td>
</tr>
<tr>
<td>Function 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness/creativity</td>
<td>2.9 (.58)</td>
<td>2.5 (.40)</td>
</tr>
<tr>
<td>Sociability</td>
<td>2.8 (.74)</td>
<td>2.8 (.73)</td>
</tr>
<tr>
<td>Communication</td>
<td>3.1 (.79)</td>
<td>2.9 (.76)</td>
</tr>
<tr>
<td>Function 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.5 (.55)</td>
<td>3.8 (.41)</td>
</tr>
<tr>
<td>Dominance</td>
<td>3.1 (.72)</td>
<td>3.6 (.59)</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses.
*p < .05, ** p < .01.

E-5 Mean comparisons by IT industry type and firm size for each group

Table E-5.1 CIO group mean comparison by IT industry type and firm size

<table>
<thead>
<tr>
<th>Construct</th>
<th>IT Industry</th>
<th>Firm Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High IT (n = 4)</td>
<td>Medium IT (n = 12)</td>
</tr>
<tr>
<td>Openness/creativity</td>
<td>3.1 (.31)</td>
<td>3.1 (.61)</td>
</tr>
<tr>
<td>Sociability</td>
<td>3.2 (.58)</td>
<td>2.8 (.86)</td>
</tr>
<tr>
<td>Communication</td>
<td>3 (.47)</td>
<td>3.1 (.9)</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.3 (.61)</td>
<td>3.5 (.61)</td>
</tr>
<tr>
<td>Dominance</td>
<td>2.7 (.98)</td>
<td>3.4 (.74)</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses.
*p < .05, ** p < .01.

Table E-5.2 CFO group mean comparisons by IT industry type and firm size

<table>
<thead>
<tr>
<th>Construct</th>
<th>IT Industry</th>
<th>Firm Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High IT (n = 6)</td>
<td>Medium IT (n = 8)</td>
</tr>
<tr>
<td>Openness/creativity</td>
<td>2.7 (.40)</td>
<td>2.6 (.47)</td>
</tr>
<tr>
<td>Sociability</td>
<td>2.8 (.72)</td>
<td>2.7 (.9)</td>
</tr>
<tr>
<td>Communication</td>
<td>3.1 (.71)</td>
<td>3.2 (.6)</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.8 (.46)</td>
<td>3.7 (.50)</td>
</tr>
<tr>
<td>Dominance</td>
<td>3.7 (.9)</td>
<td>3.3 (.42)</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses.
*p < .05, ** p < .01.
<table>
<thead>
<tr>
<th>Construct</th>
<th>High IT n=4</th>
<th>Medium IT n=9</th>
<th>Low IT n=6</th>
<th>F-test</th>
<th>Small n=0</th>
<th>Medium n=6</th>
<th>Large n=13</th>
<th>F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness/creativity</td>
<td>3.8 (.24)</td>
<td>3.7 (.23)</td>
<td>4 (.18)</td>
<td>3.82</td>
<td>--</td>
<td>3.7 (.3)</td>
<td>3.8 (.24)</td>
<td>1.60</td>
</tr>
<tr>
<td>Sociability</td>
<td>4.3 (.547)</td>
<td>4.2 (.44)</td>
<td>4.4 (.44)</td>
<td>.379</td>
<td>--</td>
<td>4.1 (.34)</td>
<td>4.4 (.48)</td>
<td>1.27</td>
</tr>
<tr>
<td>Communication</td>
<td>4.3 (.38)</td>
<td>4.3 (.42)</td>
<td>4.3 (.63)</td>
<td>.013</td>
<td>--</td>
<td>4.2 (.3)</td>
<td>4.4 (.52)</td>
<td>.899</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>4.4 (.42)</td>
<td>4.4 (.54)</td>
<td>4 (.7)</td>
<td>.927</td>
<td>--</td>
<td>4.1 (.65)</td>
<td>4.4 (.53)</td>
<td>1.16</td>
</tr>
<tr>
<td>Dominance</td>
<td>3.4 (.32)</td>
<td>3.4 (.68)</td>
<td>3.4 (.57)</td>
<td>.009</td>
<td>--</td>
<td>3.6 (.54)</td>
<td>3.3 (.56)</td>
<td>.384</td>
</tr>
</tbody>
</table>
Appendix F

Study 3 Demographics, details of instructions and procedures

Table F-1: Demographic statistics for the senior manager sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Strategic</th>
<th>Tactical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size $n = 63$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Female</td>
<td>12 (42.9%)</td>
<td>14 (40.9%)</td>
</tr>
<tr>
<td>- Male</td>
<td>18 (57.1%)</td>
<td>19 (59.1%)</td>
</tr>
<tr>
<td>Firm size (number of employees):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Large (501 or more)</td>
<td>14 (57.1%)</td>
<td>16 (63.6%)</td>
</tr>
<tr>
<td>- Medium (101 – 500)</td>
<td>9 (25.6%)</td>
<td>8 (8.2%)</td>
</tr>
<tr>
<td>- Small (100 or fewer)</td>
<td>7 (14.3%)</td>
<td>9 (18.2%)</td>
</tr>
<tr>
<td>Industry (level of IT)$^1$:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- High IT intensive</td>
<td>8 (23.8%)</td>
<td>8 (9.1%)</td>
</tr>
<tr>
<td>- Medium IT intensive</td>
<td>15 (33.7%)</td>
<td>19 (27.3%)</td>
</tr>
<tr>
<td>- Low IT intensive</td>
<td>6 (9.5%)</td>
<td>6 (9.1%)</td>
</tr>
</tbody>
</table>

Table F-2: Contingency Table for 1st ranking suitability student sample

<table>
<thead>
<tr>
<th>Committee Type</th>
<th>Candidate</th>
<th>Count</th>
<th>Total %</th>
<th>Col %</th>
<th>Row %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic</td>
<td>CFO</td>
<td>23</td>
<td>8.82</td>
<td>17.65</td>
<td>50.02</td>
</tr>
<tr>
<td></td>
<td>CIO</td>
<td>9</td>
<td>9.05</td>
<td>18.00</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td>CMO</td>
<td>18</td>
<td>54.76</td>
<td>36.00</td>
<td>49.02</td>
</tr>
<tr>
<td>Tactical</td>
<td>CFO</td>
<td>19</td>
<td>24.51</td>
<td>7.84</td>
<td>50.98</td>
</tr>
<tr>
<td></td>
<td>CIO</td>
<td>25</td>
<td>73.53</td>
<td>30.77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMO</td>
<td>8</td>
<td>36.54</td>
<td>15.38</td>
<td></td>
</tr>
</tbody>
</table>

Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>ChiSquare</th>
<th>Prob&gt;ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>12.125</td>
<td>0.0023*</td>
</tr>
<tr>
<td>Pearson</td>
<td>11.722</td>
<td>0.0028*</td>
</tr>
</tbody>
</table>
### Table F-3 Contingency Table for 1st ranking suitability senior manager sample

#### Contingency Table

<table>
<thead>
<tr>
<th>Committee Type</th>
<th>Candidate</th>
<th>CFO Count</th>
<th>Total %</th>
<th>Col %</th>
<th>Row %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic</td>
<td>CFO</td>
<td>12</td>
<td>19.05</td>
<td>46.15</td>
<td>40.00</td>
</tr>
<tr>
<td></td>
<td>CIO</td>
<td>4</td>
<td>6.35</td>
<td>17.39</td>
<td>13.33</td>
</tr>
<tr>
<td></td>
<td>CMO</td>
<td>14</td>
<td>22.22</td>
<td>100.00</td>
<td>46.67</td>
</tr>
<tr>
<td>Tactical</td>
<td>CFO</td>
<td>14</td>
<td>22.22</td>
<td>53.85</td>
<td>42.42</td>
</tr>
<tr>
<td></td>
<td>CIO</td>
<td>19</td>
<td>30.16</td>
<td>82.61</td>
<td>57.58</td>
</tr>
<tr>
<td></td>
<td>CMO</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

#### Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>ChiSquare</th>
<th>Prob&gt;ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>30.050</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Pearson</td>
<td>23.848</td>
<td>&lt;.0001*</td>
</tr>
</tbody>
</table>
Table F-4 Fair base line comparison for the tactical committee student sample

<table>
<thead>
<tr>
<th>Level</th>
<th>Count</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
<td>19</td>
<td>0.36538</td>
</tr>
<tr>
<td>CIO</td>
<td>25</td>
<td>0.48077</td>
</tr>
<tr>
<td>CMO</td>
<td>8</td>
<td>0.15385</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>1.00000</td>
</tr>
<tr>
<td>N Missing</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

3 Levels

Test Probabilities

<table>
<thead>
<tr>
<th>Level</th>
<th>Estim Prob</th>
<th>Hypoth Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
<td>0.36538</td>
<td>0.33333</td>
</tr>
<tr>
<td>CIO</td>
<td>0.48077</td>
<td>0.33333</td>
</tr>
<tr>
<td>CMO</td>
<td>0.15385</td>
<td>0.33333</td>
</tr>
</tbody>
</table>

Method: Fix hypothesized values, rescale omitted
Note: Hypothesized probabilities did not sum to 1.
Probabilities have been rescaled.

<table>
<thead>
<tr>
<th>Test</th>
<th>ChiSquare</th>
<th>DF</th>
<th>Prob&gt;Chisq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>9.4299</td>
<td>2</td>
<td>0.0090*</td>
</tr>
<tr>
<td>Pearson</td>
<td>8.5769</td>
<td>2</td>
<td>0.0137*</td>
</tr>
</tbody>
</table>
Table F- 5 Fair base line comparison for the strategic committee student sample

<table>
<thead>
<tr>
<th>Strategic Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>N Missing</td>
</tr>
</tbody>
</table>

3 Levels

<table>
<thead>
<tr>
<th>Test Probabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>ChiSquare</th>
<th>DF</th>
<th>Prob&gt;Chisq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>6.4951</td>
<td>2</td>
<td>0.0389*</td>
</tr>
<tr>
<td>Pearson</td>
<td>6.0400</td>
<td>2</td>
<td>0.0488*</td>
</tr>
</tbody>
</table>

Method: Fix hypothesized values, rescale omitted
Note: Hypothesized probabilities did not sum to 1.
Probabilities have been rescaled.
Table F- 6 Fair base line comparisons for the tactical committee manager sample

<table>
<thead>
<tr>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>N Missing</td>
</tr>
</tbody>
</table>

3 Levels

<table>
<thead>
<tr>
<th>Test Probabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>ChiSquare</th>
<th>DF</th>
<th>Prob&gt;Chisq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>27.5212</td>
<td>2</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Pearson</td>
<td>17.6364</td>
<td>2</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

Method: Fix hypothesized values, rescale omitted
Note: Hypothesized probabilities did not sum to 1. Probabilities have been rescaled.
Table F- 7 Fair base line comparison for the strategic committee senior manager sample

<table>
<thead>
<tr>
<th>Strategic Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>N Missing</td>
</tr>
</tbody>
</table>

3 Levels

<table>
<thead>
<tr>
<th>Test Probabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>ChiSquare</th>
<th>DF</th>
<th>Prob&gt;Chisq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>6.4666</td>
<td>2</td>
<td>0.0394*</td>
</tr>
<tr>
<td>Pearson</td>
<td>5.6000</td>
<td>2</td>
<td>0.0608</td>
</tr>
</tbody>
</table>

Method: Fix hypothesized values, rescale omitted
Note: Hypothesized probabilities did not sum to 1. Probabilities have been rescaled.
F-8 Mean differences for demographic variables for each condition

One-way ANOVAs were conducted for level IT (e.g., low, medium, high), firm size (e.g., small, medium, large), and gender for the tactical and strategic condition. There were no statistically differences in “good-fit” across the conditions per each group. Please refer to the following tables for details.

<table>
<thead>
<tr>
<th>Table F-8.1 Analysis of Variance for “good-fit” ratings listed by Industry IT level across the groups in the tactical condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
</tbody>
</table>

*Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. p < .05, ** p < .01.*

<table>
<thead>
<tr>
<th>Table F-8.2 Analysis of Variance for “good-fit” ratings listed by Industry IT level across the groups in the strategic condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
</tbody>
</table>

*Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. * p < .05, ** p < .01.*

<table>
<thead>
<tr>
<th>Table F-8.3 Analysis of Variance for “good-fit” ratings listed by Firm Size across the groups in the tactical condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>CFO</td>
</tr>
<tr>
<td>CIO</td>
</tr>
<tr>
<td>CMO</td>
</tr>
</tbody>
</table>

*Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. * p < .05, ** p < .01.
Table F-8.4 Analysis of Variance for “good-fit” ratings listed by Firm Size across the groups in the strategic condition

<table>
<thead>
<tr>
<th>Group</th>
<th>Small n=6</th>
<th>Medium n= 5</th>
<th>Large n= 14</th>
<th>df</th>
<th>MSS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
<td>3.7 (.53)</td>
<td>3.5 (1.1)</td>
<td>3.9 (1.0)</td>
<td>2</td>
<td>.353</td>
<td>.381</td>
</tr>
<tr>
<td>CIO</td>
<td>3 (.89)</td>
<td>2.9 (.86)</td>
<td>3 (.57)</td>
<td>2</td>
<td>.009</td>
<td>.017</td>
</tr>
<tr>
<td>CMO</td>
<td>3.8 (.66)</td>
<td>4.2 (.46)</td>
<td>3.9 (.55)</td>
<td>2</td>
<td>.259</td>
<td>.818</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. p < .05, ** p < .01.

Table F-8.5 T-tests for “good-fit” ratings listed by Gender across the groups in the tactical condition

<table>
<thead>
<tr>
<th>Group</th>
<th>Female n=9</th>
<th>Male n=12</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
<td>3.4 (.70)</td>
<td>3.7 (.77)</td>
<td>-1.040</td>
</tr>
<tr>
<td>CIO</td>
<td>4.3 (.66)</td>
<td>4.1 (.67)</td>
<td>.620</td>
</tr>
<tr>
<td>CMO</td>
<td>2.7 (.98)</td>
<td>2.6 (.76)</td>
<td>.255</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. * p < .05, ** p < .01.

Table F-8.6 T-tests for “good-fit” ratings listed by Gender across the groups in the strategic condition

<table>
<thead>
<tr>
<th>Group</th>
<th>Female n=13</th>
<th>Male n=12</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
<td>3.8 (1.1)</td>
<td>3.8 (.83)</td>
<td>.046</td>
</tr>
<tr>
<td>CIO</td>
<td>3 (.55)</td>
<td>2.9 (.82)</td>
<td>.286</td>
</tr>
<tr>
<td>CMO</td>
<td>4 (.54)</td>
<td>3.8 (.58)</td>
<td>.866</td>
</tr>
</tbody>
</table>

Note: Cell entries are the means of the group for each factor with standard deviations in parentheses. * p < .05, ** p < .01.
Appendix G

Study 4 Details of instructions and procedures

Scenarios

After working in the IT department or Marketing department (target manipulation) and earning a reputation as the “IT Guy” or “Marketer Guy” of the company, Chris was appointed as the Chief Information Officer (CIO) or the Chief Marketing Officer (CMO). In this role, Chris supports the firm’s objectives by overseeing all aspects of IT or Marketing within the firm. In response to recent competitive threats, the CEO assigns Chris the task of evaluating the firm’s online pricing strategy and developing an innovative new strategy to add long-term value to the firm. After some analysis, Chris decides to implement a variable pricing scheme. The new system lowers the price of older products that have become less popular; in order to clear the firm’s current inventory and avoid situations where the firm is left with products it cannot sell.

Non-mistake condition:
“The system is undergoing testing, and is expected to be delivered on time and under budget in six months. The CEO will expect a performance report after its implementation.”

Mistake condition:
“The system is delivered on time and under budget in six months. However, six months after implementation, the CEO discovers that older products are priced too low, below their marginal cost, and that the firm is moving quickly toward financial jeopardy. The system is discontinued immediately”