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THE IMPORTANCE OF A CEO'S
MARKET ORIENTATION

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The purpose of this study was to examine the relationship between CEOs' functional experiences and the corporations' customer equity as captured by American Customer Satisfaction Index (ACSI) scores which have been closely related to strong, sustained business performance.

The relationship between functional backgrounds of Fortune 500 CEOs and their firms' ACSI scores was investigated to assert the specific role of the CEO's marketing orientation using ANOVA. Data were collected by examining CEO biographies of ACSI-rated Fortune 500 firms through publicly available databases. Our results showed that CEOs with marketing, sales, and/or research and development functional experiences were associated with higher ACSI scores, which has been linked to reduced volatility, enhanced cash flow, and higher anticipated returns (Heskett, Jones, Loveman, Sasser, and Schlesing, 1994). This study indicates that firms would be well advised to develop CEO succession plans with marketing oriented leaders in mind who bring foundational experiences of customer focus and generating growth.

Key words: *chief executive officer (CEO), market orientation, internal orientation, output, throughput, American Customer Satisfaction Index (ACSI).*

Introduction

The influence of chief executive officers (CEOs) on corporate decision-making processes and strategic planning has been notably strong as CEO predispositions have played an important role in shaping corporate actions (Herrmann and Datta, 2006). This impact has been so pronounced that Jensen and Jajac (2004) suggest procedures that would parse the CEO's influence on corporate decision-making from that of the top management team to better understand corporate policies and procedures. Ultimately, the importance of the decision-making process that takes place in the upper echelons of a corporation is reflected in the performance outcomes for their firms (Musteen *et al.*, 2006). A considerable body of research has examined corporate leaders' observable characteristics with the intent of gaining a deeper understanding of their influence on corporate strategy (Finkelstein and Hambrick, 1990; Hambrick and Mason, 1984).

Many scholars have analyzed cognitive frameworks, observable characteristics, incentive systems, and professional experiences to assess how these characteristics may have shaped the way corporate leaders guide their organizations (Chaganti and Sambharay, 1985; Hambrick *et al.*, 2005; Sanders and Hambrick, 2007). Researchers have also tested cognitive models, biases, and situational perceptions to gain a better understanding of the choices made by chief executive officers. Among these, functional experiences in corporate contexts may be particularly revealing of the CEOs' focus and attention, with particular attention to their experiences as defined by output or throughput activities (Musteen *et al.*, 2006).

Many years of work have yielded a generally-accepted approach to executives' functional experiences by placing executives into output or throughput categories (Barker and Mueller, 2002). Persons with experiences in marketing, sales, and research and development (R&D) have been designated as output thinkers and doers because of their tendencies to seek growth and innovation to improve business performance (Krasnikov and Jayachandran, 2008). Top managers with a high tolerance for risk who favor innovative activities and pro-activeness have been found to positively impact firm performance (Davis *et al.,* 2010). By the same token, persons that form the throughput group have experiences in production, accounting/finance, administrative or legal, and they often look to efficiencies to enhance business outcomes (Slater and Narver, 2000). The ways in which corporate decision-making processes have been influenced by the predispositions of the two camps may have resulted in differences in the measurable corporate outcomes as well (Slater and Naver, 2000).

One of the methods to assess corporations' output orientation has been to examine customer equity captured in the American Customer Satisfaction Index (ACSI) scores, which have been closely related to strong, sustained business performance (Fornell *et al.*, 2006; Kumar and Shah, 2009).

An emphasis on customer satisfaction, as profiled by ACSI scores, has tended to bode well for strong corporate financial outcomes such as shareholder wealth, market share, and stock market returns (Verhoef and Leeflang, 2009). Because ACSI scores and the market value of equity have been positively associated, monitoring this relationship could benefit many stakeholders, particularly investors (Fornell *et al.*, 2006), in long term investment strategy (Aksoy *et al.*, 2008). Higher customer satisfaction is also associated with reduced risk stock market returns (Tuli and Bharadway, 2009), and this may be partially explained through reduced volatility in cash flows from customers (Kumar and Shah, 2009).

We contend that chief executive officers with output functional experiences, especially marketing and sales experiences and R & D, will often influence firms toward more attention to customer satisfaction, and ultimately, stronger financial performance. Our literature review demonstrates the links among these concepts, which have been evolving through almost thirty years of theory-building and hypothesis-testing. That being said, the purpose of this research is to examine the relationship between chief executive officers' functional experiences and the corporations' customer satisfaction scores, which may have been associated with companies' stronger, less volatile financial performance (Rao and Bharadwaj, 2008).

Theoretic Background

Corporate leadership

Corporate elites, with the responsibilities for guiding organizations, have comprised the all-important governance structure of corporations (Jensen and Zajac, 2004). Their individual predispositions and proclivities are important to understanding organizational decision-making and strategic planning (Auh and Menguc 2005; Hambrick *et al*., 2005; Morgan and Strong, 2003; Thomas, 1988). The influence that a CEO exerts on strategic planning, decision-making, and policy-making may have widely ranging effects (Baker and Mueller, 2002; Herrmann and Datta, 2006; Musteen, *et al*., 2006). For example, a chief executive officer's attitude toward change has been shown to influence strategy, although those effects diminish over time (Musteen *et al*., 2006). One study showed that the CEO's professional experience influenced corporate spending on research and development, while controlling for corporate strategic thrusts, ownership patterns, and other company-level conditions (Barker and Mueller, 2002). Foreign direct investment decisions regarding the entry mode chosen have also been shaped by CEO experiences, particularly whether the executive had come from a throughput oriented background such as finance, or an output oriented background such as marketing or sales (Herrmann and Datta, 2006).

A considerable body of research has examined factors that could shape decision-making processes and tendencies among corporate leaders, and these include, but are not limited to, functional experiences and observable characteristics (Finkelstein and Hambrick, 1990). Compensations plans, agency theory and other aspects of the motivation of corporate leaders have garnered considerable attention in understanding their impact on corporate strategy (Veilyath *et al*., 1994; White *et al*., 1994). Age, culture, gender, and personality and their impact on the strategic process have been the focus of recent studies (Davis *et al*., 2010; Densten *et al*., 2012; Langabeer *et al*., 2011; Rodenbach *et al*., 2012). The objective of this study was to gain a deeper understanding of both the influences on and outcome of corporate strategy (Hambrick and Mason, 1984), and define the chief executive officers' particular predispositions (Cho, 2006; Galbreath and Galvin, 2007; Strandholm *et al*, 2002).

Factors shaping CEO decision-making

Many scholars have examined corporate leadership approaches to discover how the leaders' cognitive frameworks, observable characteristics, incentive systems, tenure, and professional experiences may impact how they guide their organizations (Chaganti and Sambharay, 1985; Henderson, *et al*., 2002; Sanders and Hambrick, 2007; White *et al*., 1994). Researchers have also tested cognitive models, biases, and situational perceptions to gain a better understanding of possible explanations decision-making, especially decisions made by chief executive officers (Hambrick *et al*., 2005; White *et al*., 1994). Among these, functional experiences in corporate contexts and organizational culture, with particular attention on experiences defined as throughput or output activities, may be particularly revealing of the CEOs' effort and attention (Kohli and Jaworski, 1990; Narver and Slater, S.F., 1990; Musteen *et al*., 2006).

Incentive or compensations plans, some of which include ownership options or rights, have influenced strategic planning by motivating corporate leaders to make a decision that is advantageous for them on a personal wealth accrual basis (Veilyath *et al.*, 1994; Oliver Wyman, 2003). Mediating effects on compensation schemes for CEOs exist, highlighting the influences that personal risks and some industrial and firm-specific outcomes may have on corporate strategy (Sanders and Hambrick, 2007). The span of employment, time in position or tenure, and rate of turnover of top corporate leaders may reflect certain tendencies on the chief executive officers actions (Cho, 2006; Galbreath and Galvin, 2007), and precipitant organizational awareness and achievements.

Functional experiences have been among one of the more consistently studied aspects of observable characteristics of top management team members, as individuals and groups, and of chief executive officers for almost thirty years (Pfeffer, 1983). After great efforts to organize the realms of activity and expertise of CEOs, a generally accepted method of categorizing the vocational endeavors and frames of reference has resulted in a dichotomous approach (Hambrick and Mason, 1984): output experiences, the more outwardly focused parts of enterprises such as marketing or sales with more attention on customers or competition or throughput experiences, which had been more inwardly focused on parameters such as efficiency.

In general, corporate leaders with orientations more aware of output considerations, such as customers or competitors or customer satisfaction, have been associated with strong, positive effects on business performance (Harrison-Walker, 2001), which has lent support to the possible benefits of strategy-manager co-alignment

(Thomas et al. 2006). Often, financial performance measures have been part of corporate leaders' evaluation criteria regardless of industry, organizational goals and other assessments (Lublin, 2010; Karlsson and Neilson, 2008; Oliver Wyman, 2003; Rjagopalan and Datta, 1996), and in general, organizations with output orientations, particularly with an emphasis on marketing or sales, have attained stronger performance outcomes than those guided by leaders with throughput orientations (Krasnikov and Jayachandran, 2008). Throughput orientations have often been characterized as those mental frameworks that would be common among persons with significant experience in finance, accounting or production. In spite of current policies that require cross-training for corporations' titular executives, individuals' tendencies to assess situations and make decisions along a throughput-output spectrum persist (Barker and Mueller, 2002). Some professional experiences may have been formative in the executive outlook toward constituencies such as, customers, and those quietly transformational effects may persist throughout a career in mental models to rank importance or prioritize expenditures (Musteen *et al.,* 2006). A chief executive officer's method of framing a situation may be reflected in the actions of the corporation she leads (Hambrick and Mason, 1984).

A strong influence from output activities, such as marketing or sales or research and development, on corporate decisions and priorities may translate into performance benefits for corporations (Fornell *et al.*, 2006; Krasnikov and Jayachandran, 2008; Rao and Bharadway, 2008). For example, customer satisfaction may be a strong indicator over a sustained period of time for strong, long-term stock market valuation (Aksoy *et al.,* 2008; Fornell *et al.*, 2006; Kumar and Shah, 2009).

Other studies indicate that concentrated corporate marketing efforts could yield greater financial outcomes than commensurate concentration of operations abilities (Kransnikov and Jayachandran, 2008), and initiatives that focused on the marketing capabilities of organizations returned improved cash flows, e.g., customers are the sources of revenue streams, and ultimately, shareholders' wealth measured in stock market returns (Rao and Bharadway, 2008). One approach to assessing corporations' output orientation has been to examine customer equity as captured by the American Customer Satisfaction Index (ACSI) scores which are closely related to sustained, strong business performance (Fornell *et al*., 2006; Kumar and Shah, 2009).

Corporate performance measures and ACSI

Customer satisfaction, as profiled by ACSI scores, has been linked with strong corporate financial outcomes for the future on measures such as shareholder wealth, market share, and stock market returns (Verhoef and Leeflang, 2009). In turn, ACSI scores have been positively associated with the market value of equity, which would benefit many stakeholders, particularly individual and institutional investors (Fornell *et al*., 2006), especially investing groups who chose to make longer term commitments as owners of the companies (Aksoy *et al*., 2008). Higher customer satisfaction, demonstrated in ACSI scores, has been show to contribute to reduced risk stock market returns (Tuli and Bharadway, 2009), and the stronger ACSI score may be partially explained through reduced volatility in cash flows from customers (Kumar and Shah, 2009).

Chief executive officers, ACSI scores, and corporate performance

Our hypothesis is that chief executive officers (CEOs) with output experiences, marketing or sales or research and development, will often influence firms by placing a greater emphasis on customer satisfaction which ultimately results in stronger financial performance. Our literature review demonstrated the links among these concepts, which have been building and strengthening over almost thirty years in this diverse field of study. The purpose of this research is to examine the relationship between chief executive officers' functional experiences and the corporations' customer satisfaction scores, which have been associated with companies' stronger, less volatile financial performance (Rao and Bharadwaj, 2008).

Hypothesis: CEOs with market orientations lead corporations that reflect higher performance measures as captured in American Customer Satisfaction index (ACSI) scores.

Methodology

The focus of this study was to investigate the relationship between the functional backgrounds of Fortune 500 chief executive officers (CEOs) and firm performance. The American Customer Satisfaction Index (ACSI) was used as a proxy for firm performance, building on robust findings which indicate that investing in firms with high customer satisfaction is far superior to investing in firms with low customer satisfaction (Aksoy, Cooil, Groening, Keiningham, and Yalçin, 2008). In light of recent economic conditions and

continued instability within many industries, ACSI was the preferred firm performance indicator over other potential financial indicators. This index (ACSI) is computed by analysts at the University of Michigan's Ross School of Business using data collected during customer interviews and entered into a multi-equation econometric model (The American Customer Satisfaction Index, 2010). The score is reported on a scale of 0-100 and provides a critical link between customer satisfaction and customer loyalty which in turn, drives revenue growth and profitability according to the Service-Profit Chain (Heskett, Jones, Loveman, Sasser, and Schlesing, 1994). As such, ACSI was used to reflect firm performance in this study:

> The ACSI model is a cause-and-effect model with indices for drivers of satisfaction on the left side (customer expectations, perceived quality, and perceived value), satisfaction (ACSI) in the center, and outcomes of satisfaction on the right side (customer complaints and customer loyalty, including customer retention and price tolerance). *The American Customer Satisfaction Index, 2010*

The first step of the data collection process was to record the index value for each Fortune 500 firm evaluated according to ACSI model. For each of these firms, the focus then shifted to the respective Fortune 500 CEO and data were collected regarding the CEOs' functional backgrounds. The biographies of these Fortune 500 CEOs were examined using public information available in online databases developed by *BusinessWeek* and *Hoovers*. In an effort to triangulate the data, functional backgrounds were evaluated according to both websites and confirmed by an additional researcher in

a separate data collection process. The functional backgrounds were defined by educational and/or professional experience in the following areas during the CEOs' careers: Marketing, Operations, Finance, Legal, Sales, Research and Development (R and D), Strategy, and Engineering. The researchers involved in this study conferred regularly to ensure that the process of categorizing functional backgrounds would be as consistent and objective as possible. For our purposes, backgrounds in sales, marketing and research & development (R&D) were grouped together as *market orientation* functions that have a primary focus on activities outside the organization, including customers, competitors, market dynamics and innovation, similar to the output activities. The balance of functions (engineering, operations, strategy, finance and legal) was grouped together as *internal orientation*: functions that have a primary focus on activities inside the organization, similar to the throughput activities. For our purposes, strategy as a functional area of management is defined as having developed a pattern in a stream of resource allocation decisions (Venkatraman and Prescott, 1990).

Results

At the time of this study, the total number of Fortune 500 firms assigned ACSI index values by the University of Michigan on the ACSI website was 126. Thus, the sample size for this study included 126 chief executive officers from Fortune 500 firms. Length of time in their role ranged from 1 year to 40 years with most of the CEOs in the sample having held their current position less than 10 years. Using SPSS 17.0, ANOVA testing was used to assess significant differences in the means of the functional backgrounds of the CEOs. See Table 1. These differences were examined by individual functional background & also by internal/market orientation. See Table 2.

Table 1
Comparing CEO Background to Company ACSI Mean

CEO Functional Background	ACSI Mean[1] – CEO with Background (A)	N	ACSI Mean[1] – CEO without Background (B)	N	Difference (A-B)[2]	Sig.[**]
Market Orientation						
1 Sales	77.24	41	74.01	85	3.23	.019[**]
2 Marketing	76.23	52	74.24	74	1.99	.131
3 R and D	78.25	8	74.85	118	3.40	.201
Market Orientation (1, 2, or 3)	**76.67**	**63**	**73.33**	**61**	**3.34**	**.011****
Internal Orientation						
5 Operations	74.73	117	79.44	9	(4.71)	.060
6 Strategy	74.26	34	75.35	92	(1.09)	.455
7 Finance	74.25	52	75.64	74	(1.39)	.294
8 Legal	71.56	18	75.65	108	(4.09)	.026[**]

[1]Fortune 500 Companies ranked by American Customer Satisfaction Index
[2]Positive difference indicates functional background is related to improved customer satisfaction, negative difference indicates functional background is related to reduced customer satisfaction
[**]$p < .05$

Fortune 500 firms led by CEOs having a Sales background reflected a mean ACSI value of 77.24, as compared with firms whose CEO did not have a Sales background (74.01). The difference of 3.23 between ACSI mean values when the CEO has a Sales background as compared to when the CEO does not have a Sales background represents a significance level of .019. Firms led by CEOs having a Marketing background reflected a mean ACSI value of 76.23, as compared with firms whose CEO did not have a Marketing background (74.24). Fortune 500 firms led by CEOs having an R and D background reflected a mean ACSI value of 78.25, as compared with firms whose CEO did not have an R and D background (74.85). For R and D, Sales, and Marketing backgrounds, the ACSI mean was higher in each instance than when these backgrounds were not present.

Firms led by CEOs having an Engineering background reflected a mean ACSI value of 75.35, as compared with firms whose CEO did not have an Engineering background (75.02). Firms led by CEOs having an Operations background reflected a mean ACSI value of 74.73, as compared with firms whose CEO did not have an Operations background (79.44). Firms led by CEOs having a Strategy background reflected a mean ACSI value of 74.26, as compared with firms whose CEO did not have a Strategy background (75.35). Firms with CEOs having a Finance background reflected a mean ACSI value of 74.25, as compared with firms whose CEO did not have a Finance background (75.64). Firms led by CEOs having a Legal background reflected a mean ACSI value of 71.56, as compared with firms whose CEO did not have a Legal background (75.65). The difference of -4.09 between ACSI mean values when the CEO has a Legal background as compared to when the CEO does not have a Legal background represents a significance level of .026. For Operations, Strategy, Finance, and Legal backgrounds, the ACSI mean was lower in each instance than when these backgrounds were not present, with Engineering being the one exception.

ANOVA testing was also conducted by examining ACSI means when the functional background represented a market orientation (Sales, Marketing, and/or R and D) and when the functional background represented an internal orientation (Engineering, Operations, Strategy, Finance, and/or Legal). Firms led by CEOs having a market orientation reflected a mean ACSI value of 76.67, as compared with firms whose CEO did not have a market orientation (73.33). The difference of 3.34 between ACSI mean values when the CEO has a market orientation as compared to when the CEO does not have a market orientation represents a significance level of .011.

A simple T-test was conducted to compare the means of the top ten percent of Fortune 500 CEOs to the lower ten percent of Fortune 500 CEOs. All but one of the top 10 performing companies (ACSI mean was 85.833) had CEOs with marketing or sales or R and D backgrounds. In sharp contrast, eight of the bottom 10 companies (ACSI mean was 58.917) were led by CEOs with financial or legal experience. As indicated in Table 2, the T-test resulted in $p = .000$ reflecting significant differences in ACSI ratings among the respective Fortune 500 CEOs.

Managerial Implications

CEO selection is a high profile, high stakes process, and the question of "what makes a successful CEO" is an important topic, with much interest and attention. One of the authors of the study had a unique perspective as a C-suite executive that had worked in several organizations with significantly different business orientations and CEOs with significantly different leadership approaches. A hypothesis began to emerge: CEOs with a market focus seemed to be leading the more successful companies. The research conducted was specifically designed to test this hypothesis and understand the relationship between the CEO's functional background experiences and firm performance. The results were clear: a CEO's functional background does differentiate firm performance, and the best performing firms were led by CEOs with sales or marketing experience.

Table 2
Functional Information on Top and Lower Ten Percent of Fortune 500 CEOs
According to ACSI Rating

Company	CEO	Years in Role	Functional Background[1]	ACSI
TOP TWELVE:				
H.J. Heinz	William Johnson	9	MS	89.00
Colgate-Palmolive	Ian Cook	2	O	87.00
Clorox	Donald Knauss	9	MOSF	87.00
Google	Eric Schmidt	7	ORStE	86.00
Amazon.com	Jeffrey Bezos	13	FSRE	86.00
Procter & Gamble	Alan Lafley	8	MOS	85.00
Kraft Foods	Irene Rosenfeld	2	MOSR	85.00
FedEx	Frederick Smith	23	MOSSt	85.00
Coca-Cola	Neville Isdell	1	MOF	85.00
Apple	Steve Jobs	27	MSRE	85.00
Kellogg	A.D. David Mackay	3	OS	85.00
Hershey	David West	2	OFS	85.00
T-test	**t = 234.620**	**df = 11**	**p = .000****	**Mean = 85.833**

BOTTOM TWELVE:				
Company	**CEO**	**Years in Role**	**Functional Background**[1]	**ACSI**
DISH Network	Charles Ergen	29	OF	65.00
Ameren	Gary Rainwater	5	OStE	64.00
United Health Group	Stephen Hemsley	2	OF	63.00
AMR	Gerard Arpey	5	OFSt	62.00
Continental Airlines	Lawrence Kellner	5	OF	62.00
Delta	Richard Anderson	1	OL	60.00
Northwest Airlines	Douglas Steenland	5	OL	57.00
Sprint Nextel	Daniel Hesse	1	MOSSt	56.00
UAL	Glenn Tilton	8	MOSRSt	56.00
Comcast	Brian Roberts	6	MOF	54.00
US Airways Group	W. Douglas Parker	10	OF	54.00
Charter Communications	Neil Smit	4	OL	54.00
T-test	**t = 48.735**	**df = 11**	**p = .000****	**Mean = 58.917**

[1]M – Marketing, O – Operations, F – Finance, L – Legal, S – Sales, R – R & D, St – Strategic, E – Engineering

**p<.05

Sales, marketing and research & development (R&D) were grouped together as *market orientation*: functions that have a primary focus on activities outside the organization, including customers, competitors, market dynamics and innovation. As a group, the relationship is quite strong, with a significance factor of .011. The balance of functions was grouped together as *internal orientation*: functions that have a primary focus on activities inside the organization. These include engineering, operations, strategy, finance and legal. None of the internally oriented functions showed a positive relationship with firm performance. Of significant note, CEOs with legal backgrounds had a negative impact on firm performance (-4.09 lower ACSI mean score).

The CEOs studied in this research nearly all had operations functional experience – 117 of the 126 had backgrounds in operations. It appears that operations experience is viewed as "necessary" experience, but the results of this study show that it is not "sufficient" experience. When considering the additional preparatory experiences for a CEO, it is the customer-focused functions of sales, marketing, and even the innovation activities of R&D that best prepare a CEO to deliver better results.

In our estimation, the role of the CEO as leader of strategy, growth and firm performance is a market focused role. Leading strategic discussions that are future oriented, recognizing and anticipating customer dynamics, is a much more productive and robust discussion when the CEO has personal knowledge and frameworks to guide the organization forward. The CEO is also much more capable of challenging plans and initiatives beyond a superficial level – and will be able to engage the executive team more effectively to focus on customer strategies for growth.

Since the Enron debacle in 2001 and the freefall of the financial sector in 2008, corporate boards have increasingly fast-tracked CFOs to the top spot, giving more emphasis to financial and investor aspects of the business. Risk aversion has given rise to a new leadership paradigm of internally oriented "profit-squeezers and cost-cutters," and personal experience has been validated with the research we conducted, showing that this path does not have positive consequences for customer satisfaction.

While marketing leadership might be expected to be the domain of consumer packaged goods, the clear implication is that all industries could benefit from this approach. Steve Jobs of Apple, Fred Smith of FedEx, and Irene Rosenfeld of Kraft are each examples of CEOs leading the best performing companies who had marketing assignments before rising to the top job. Conversely, the lowest performing companies in this study were most likely to have a combination of operations and financial or legal backgrounds: nine of the twelve lowest performing firms were led by CEOs with internally oriented backgrounds.

Conclusion

The findings show that boards would be well advised to develop CEO succession plans with market oriented leaders in mind, who bring foundational experiences of customer focus and generating growth. This is a game changing revelation given that marketing is losing ground within firms

(Verhoef and Leeflang 2008; Schultz 2005; Webster, *et al.* 2005). The findings also suggest that there are important market oriented career experiences that prepare a CEO to deliver better results for customers and shareholders. Aspiring CEOs should seek out marketing and sales experience to better prepare themselves for the leadership role, and HR leaders should include marketing and sales assignments for the top talent in their firms.

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INTERNET, DISINTERMEDIATION AND HUMAN CAPITAL: PRESENT AND FUTURE CANDIDATES

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The Internet is gradually becoming a major player in organizational strategies for efficiency and success for public as well as private organizations. The increasing power of the Internet stands out even more as higher levels of displaced and laid off workers are reported. For example, for the first time, the U.S. Postal Service is laying off 7,500 employees, in part because of increased electronic communications using the Internet. This research examines the Internet and disintermediation.

Introduction

According to Internet World Statistics, as of December 2011 there are 2.3 billion Internet users. The Internet is a constantly growing and evolving resource which provides varied and vast opportunities, values and uses to multitudes of people. Thomas Friedman (2005) discusses how the Internet exploded in 1995 when the user-friendly Netscape browser went public. With the easy-to-use browser, all types of users world-wide were able to connect and easily access the Web. The Internet provides real time, anywhere, anytime, fast, easy and efficient access to all types of resources globally such as: products, services, information and people. Further, the Internet is used for all types of purposes such as: travel, banking, e-book downloads, music and video downloads, buying and selling, social networking and so much more.

Mobile computing and the use of smart phones have also increased functionality and access to the Internet. New mobile applications are steadily being developed to address mobile phone users' needs. For example we can now use our mobile phones to pay for purchases such as food and tickets.

Before the Internet explosion, face-to-face, telephone and postal mail service were seen as more popular methods of communicating. People went to the banks, the post office, the music stores and book stores to transact business. There were no online emails or social networks with which to interact.

The Internet which is defined in this paper as a network of individual networks, was very different than it is today (Mackie-Mason, 1993). It started with a very limited

number of users working on government research. In the mid1990s the Internet was much more expensive and exclusive. In 1995 there were an estimated 16 million users of the Internet. However in December 2011, this number sky rocketed to 2.3 million users based on statistics from Internet World Statistics.

As the Internet continues to grow it provides many opportunities for startups as well as existing businesses. The Internet e-business has many e-models such as: business-to-Business (B2B), auctions, and affinity portals. Many businesses are pure e-businesses where all of their business is conducted over the Internet. Other businesses are mixed where part of their business is conducted over the Internet and part is conducted at a physical (brick and mortar) location.

With both of these methods there maybe workers involved. However, as the product or service becomes more of a "pure" online experience where they are increasing their online e-business activity, there may be more opportunities to remove the "middleman" from the traditional business process. With this removal comes the potential for greater job loss and displaced workers.

Herein is one of the downsides to the Internet. The increased digitization of the products or services in conjunction with lower costs may open the possibility for increased job loss and displaced workers due to Internet disintermediation.

Disintermediation is defined as the elimination of intermediaries also referred to as "middlemen" (Scott, 2000). One example

of disintermediation occurs when a customer buys an e-ticket directly from the airline company instead of the travel agent. The travel agent is being replaced by the customer's ability to do the task without an agent's help.

In the future it will become important for firms to continually reassess the role and value of the Internet and possibilities of disintermediation within the firm. It is important to demonstrate the added value of intermediaries in order for them to survive (Wigand and Benjamin, 2005; Patel, 1999).

This value becomes particularly important for brick-and-mortar businesses. Firms with strategies involving agility and innovation regarding their Internet competitors may experience more success. Evaluation of e-commerce initiatives in concert with their physical businesses may help in sustaining a competitive position (Wigand and Benjamin, 2005; Porter, 1985).

Some services and products are better candidates for e-businesses than others. The e-business success and need for an intermediary can relate to the type of customer that is targeted by a firm (Wigand and Benjamin, 1995). For one, if you have a customer who knows the product well and is only interested in getting the product with very basic, generic information, the intermediary may be less valuable. The customer may be more willing to use an online, Internet-based version of the business. In this case, disintermediation may be more of a threat. However, if the customer relationship is more of a strategic partnership which requires more negotiation and direct interaction, the intermediary may be more valuable and the threat of Internet

disintermediation may not be as great. Wigand and Benjamin (1995) argue that transaction costs and intermediary costs in a Business-to-Consumer (B2C) environment are reduced and therefore the intermediaries' value is lessened which can then lead to disintermediation. These lower transaction and labor costs can lead to lower costs for customers, which may then increase demand for the B2C environment. As customers choose the Internet over the brick-and-mortar location, this can decrease the need for workers and increase job loss.

The employment picture in this country is not rosy. According to the Bureau of Labor Statistics (November, 2012) the unemployment rates is 7.7 percent with about 12 million persons unemployed, and there is no indication that employers will begin hiring anytime soon. In addition, there are another 8.8 million people who are underemployed – they are working part-time but would prefer to work full-time. And there are another 2.6 million unemployed people who have become frustrated with their job prospects and have stopped looking for work; they are not counted in the official unemployment figures (Leonard, 2011)

There are several reasons why the unemployment rate has remained high. First of all, the recession, which officially ended in June 2009, appears to still be present among workers. Companies have expanded their output, profits are higher, but there has not been a corresponding increase in hiring (Linn, 2012). Many firms that reduced their employee levels during the recession discovered that they could increase their production without adding employees once the economy brightened (Linn, 2012). Firms

are becoming more efficient and learning how to produce more with less.

During the recession, firms that saw profit declines evaluated many options to reduce costs. Many decided to move some or all of their production facilities abroad where operating costs were lower (Helyar, 2012). Thus when the economy improved and they decided to add workers, the increase in employment did not help the employment picture in this country.

As the recession ended and the economy improved, there was no robust increase in consumer spending. There is some question as to whether the economy will continue to improve since consumer spending is the major driver of economic growth. This uncertainty has made some firms reluctant to hire additional workers at this time.

There is also uncertainty over congressional actions and spending and debt management. The Joint Select Committee on Deficit Reduction, which consists of three Democrats from the Senate, three Republicans from the Senate, three Democrats from the House of Representatives, and three Republicans from the House, has the responsibility to develop a proposal to reduce the deficit. If it cannot agree on a set of recommendations, or if the recommendations are not enacted by Congress, there will be across the board spending cuts. These spending cuts will have a negative impact on the economy, and some firms have developed a wait and see posture.

Spending cuts by state and local governments have resulted in the layoffs of thousands of teachers, university personnel, and other state and local government employees (Clark, 2011; Noblit, 2012). These layoffs have added to the jobless rate.

Another contributor to job losses, one that has not been widely recognized in the literature, is the Internet. The purpose of this paper is to explore the impact of the Internet on the loss of jobs in this country.

Recent Job Losses Because of the Internet

U. S. Postal Service

The U.S. Postal Service is an agency in financial disarray; it has had large losses in recent years primarily because of drops in revenue. The Internet is primarily to blame: individuals pay bills online, taxes are largely paid online, individuals send email and text messages rather than send letters, and social security checks and other payroll checks are no longer sent by mail but instead by direct deposit (Garvin, 2011). It has been estimated that the amount of first class mail declined by 19% over the last decade, and it is expected to fall by another 37% over the next ten years (Garvin, 2011). Even those who use the mail can purchase their stamps online. Since about 80% of the postal service's budget goes to employees in the form of salaries and benefits, any cost cutting to reduce the agency's losses will require significant job cuts (Garvin, 2011). Over the last four years 110,000 jobs have been cut, 7,500 administrative staff positions have been eliminated, and the agency is seeking congressional approval to cut an additional 120,000 positions and close 3,653 post offices (Schmid, 2011; Levitz, 2011).

Book stores

Borders, the second largest bookstore in the nation, filed for bankruptcy and closed 237 of their 642 stores and 11,000 jobs in February 2011 (Barror, 2011). They are scheduled to close all their stores in September 2011. One factor blamed on their closing is the increased use of downloadable e-books (Barror, 2011). Bookstores are experiencing major challenges as Internet downloading of digital books to e-readers and electronic books (E-books) continues to increase in popularity.

According to the Association of American Publishers, e-book sales have doubled since 2010 and make up 9% of total consumer book sales. E-readers, such as the Apple I pad; Sony Reader; Amazon Kindle and Barnes and Noble Nook, are devices that allow Internet access to e-books and other reading materials quickly and easily. With e-readers, customers do not need to go to the bookstores to purchase their books or get help from the sales staff. In many cases, they are buying at reduced costs by cutting out the middleman.

The use of the e-reader and the Internet to access digital books is eliminating the need for many employees working in the bookstores. As the number of e-book downloads are increasing, disintermediation is leading to job losses for employees.

Record stores

The Internet and the use of digitized music have had a major impact on the basic operating principles of the record industry. Increased use of the Internet for digital

music has contributed to online music piracy, the decline of purchasing music CDs and DVDs and the decline of the traditional record label business. As digital music downloads to digital electronic devices continue to escalate, CD in-store sales continue to decline (Harvilla, 2010). According to the U.S. census data there was a net loss of 1,900 record stores from 2002 to 2005. In other words, for every four record stores, one record store closed (Tozzi, 2008).

As music devices and digitized music increased, the Internet provided easy access to the music through downloads. Since 1996 when illegal downloading of music gained major attention, the retail music industry has been steadily declining (Ryan and Hadida, 2010). Users were able to use different websites such as Napster to access music for free. The music was accessed and delivered directly over the Internet, which eliminated the need for the intermediaries in the physical record stores. Customers were able to select which music they wanted rather than being limited by the selections on the shelf. So convenience, cost and accessibility helped to diminish the value of the record store employees. Physical distribution of CDs dropped to 21 percent in 2009 (Ryan and Hadida, 2010). Many employees in the music industry are no longer needed when customers are able to obtain their music without the help of music employees. This is another case of disintermediation leading to job loss.

Video rental companies

Video stores are experiencing the effects of the Internet resulting in possible layoffs for many video store employees.

Blockbuster, the nation's largest video chain, filed for bankruptcy in 2011. They are not alone in their struggles as numerous accounts of problems from other video stores are also being reported (Hodges, 2009). Hollywood Video and Family Video are just a few of the companies that are closing some of their stores. The video industry is changing as new ways of obtaining video movies are spreading.

Customers are turning to other more attractive, cheaper alternatives such as on-demand downloads and online rentals from competitors such as Netflix, Vudu and Amazon. Netflix has over 11 million subscribers who are able to inexpensively get mail-order rentals and online streams using the Internet (Hodges, 2009).

The ease, cost and convenience of using digital video downloads is forcing video stores to rethink their strategies and look for inter-connections with the Internet, brick and mortar stores and customers. For example, Blockbuster started renting and reserving their CD and DVD rentals online like Netflix. The Video stores will have to find common connections using online web-based businesses. For example, offering online coupons and discounts that can be used at blockbuster or other partnering stores with complementary products/services.

Future job losses because of the Internet

Bookstores

E-books are growing in popularity and at the same time creating challenges for traditional books stores. Bookstores are struggling with how to adapt and continue to

show their value as intermediaries within the stores. Without new strategies that look for synergies that complement the e-reader and the e-book popularity, the cost and value of in-store employees may steadily decrease. Along with this is the potential for many bookstore employees to lose their jobs through disintermediation.

Barnes and Noble, the nation's largest bookstore is restructuring and re-strategizing to address the e-books and increased disintermediation. They are planning for the future by increasing their digital presence and consolidating many of their 717 superstores (Minzesheimer, 2011). Their digital presence will complement their in-store presence and capitalize on their customers and loyalty programs. However, job losses may result. The digital presence along with business process and technological efficiencies can reduce the need for some of the in-store workers as many convenient, anytime; online self-service functions become more available to customers and suppliers.

Barnes and Noble stores are also selling their own e-reader. They promote their own e-reader called the Nook where customers can download e-books from their websites. When a customer downloads an e-book, there is less of a need for in-store workers to help with obtaining, ordering or paying for a book. After books are downloaded, they can customize them. For example, they can convert the text to large print books. This again eliminates the need to go into the store to purchase large-print books from a worker. Young readers who are familiar with the Internet devices and technology may quickly gravitate toward reading e-books.

Book Publishers

Self-publishing using the Internet continues to grow. It provides competition for the traditional publishing process while also increasing the potential threats of disintermediation. Although the traditional publishing companies do offer strong marketing benefits, the flexibility, reduced cost and time to publish are characteristics that help make self-publishing attractive.

Self-publishing using electronic publishing software allows a user to publish his or her books effectively and efficiently without help from publishing staff. In the future, if this trend continues, and better marketing strategies are developed, many publishing staff employees will not be needed as authors decide to use the Internet resources to publish for them. Benefits of self-publishing include: independence, cost savings, convenience, flexibility, and reduced time associated with interacting with the publishing company (Kharif, 2005).

For example, one e-publishing company, Lulu.com is inexpensive, easy and faster as it cuts out the middleman (intermediaries). Lulu.com allows the authors to pick the layout, put their text into the layout and the book is then ready to sell to customers through Amazon.com. Amazon will get 20% of the profit as opposed to the traditional publishing (non-electronic) where publishers get a 50% cut (Kharif, 2005).

Traditional publishing companies will need to find creative ways to demonstrate value while complementing the electronic self-publishing market.

Movie Theaters

All across the country there are reports of movie theaters closing. One contributing factor involves downloadable digital movies. The ability of users to access and download digital movies is creating competition for the movie theater industry.

For years people have been enjoying going out to the movie theaters with friends and family. However, fewer people are going to the movies as they find less expensive alternatives to viewing movies at movie theaters. As a result, movie theaters are experiencing reduced viewership and less profit (Fisher, 2008).

In many cases, downloading digital movies is less expensive. For one, movie piracy provides a free alternative for potential movie theater customers. There has been increased interest and access to illegal movies through illegal file sharing and movie piracy. In June 2007 nine websites were shut down for movie pirating where users were allowed to download and view movies illegally for free (Smith and Benoit, 2007).

Movie theaters are also experiencing competition from legitimate websites such as Netflix, Vudu and Amazon where customers can buy or rent movies from a broad selection.

The ease of digitizing and accessing digital movies may increase the chances of disintermediation and job loss in the movie theater industry. Porter (1985) emphasizes the need to find synergies when developing competitive strategies. New strategies for the movie theater industry may include

inter-relationships between the online and brick and mortar businesses. For example, customers could buy tickets online at discounted prices or have special online coupons for use at the theater.

Banking

The Internet is having a substantial impact on employment in the retail/commercial banking industry. The need for retail/commercial branches will be decrease because more and more deposits are being made online, payments are being made online, and cash can be obtained from automated teller machines. Brokerage firms such as Charles Schwab and E*Trade offer online banking services without brick and mortar banking locations, and there are several Internet only banks (ING Direct, Ally Bank, FNBO Direct, and HSBC Advance are several examples). As branch banking declines, there will be declines in the need for tellers, head tellers, branch managers, janitors, security guards, and other branch related personnel.

Real estate agents

The use of the Internet is changing the direction and existence of real estate agencies (Markano, 2012) The days are long gone when a typical agent, for a commission, would take a client to physically inspect several houses, prepare and submit an offer to the agent of the seller, negotiate a counter offer, and arrange the closing. Today one can specify the area and price range in which he is interested, the number of bedrooms, bathrooms, and other amenities desired, and arrange a virtual tour, where he can view the bedrooms, kitchen, living room, back yard, and other features of

the house – all from a computer screen. After a potentially desirable house has been found, an appointment can be made for a physical inspection, and arrangements for a sale can be made all without the use of an agent (Virtual Future, 2009).

The number of owners selling their homes without agents is steadily growing as owners are increasingly realizing the ease in using the Internet and the cost savings in selling their homes using the Internet without agents (Mullins, 2009). At the same time, the number of real estate agents is dropping. For example, according to the California Department of Real Estate (CDRE), the number of real estate agents in active status dropped from 190,833 in September 2011 to 181,742 in September 2012 (Markano, 2012).

The number of agents at Coldwell Banker Triad Realtors, a real estate firm operating in the Greensboro, NC area, decreased from nearly 300 agents in 2006 to about 210 today. A smaller Greensboro area firm, Century 21 Elliott Properties, saw a decrease from 45 to 22 agents. And the North Carolina Real Estate Commission licensed 2,500 new agents in 2010, a drastic drop from the 15,000 licensed in one year when the real estate market was at its height (Frazier, 2011). The decline in the need for agents will also decrease the need for real estate schools and their instructors who provide pre-licensing education for new agents and continuing education classes for established agents. You really need to separate out the confounding effects here.

Life and Automobile Insurance Agents

Clerks and agents who sell life, health, and auto insurance to clients for a commission will see a continued decline in the need for their services (Jergler, 2012). Individuals are increasingly purchasing insurance coverage from insurance carriers directly without use of an agent. There are a variety of web sites that allow individuals to compare insurance costs online, information is widely available about the features of different types of insurance policies, and purchases can be made without the pressure of dealing with an agent (More Drivers, 2009). If one wishes to discuss his insurance needs with an agent, that option is, of course, still available.

College and University Faculty Positions

There is a cost squeeze in college education today, and the public anxiety is becoming more evident. David Shi, a former president of Furman University, noted that college costs have increased 50% over the last decade, whereas family incomes actually fell between 2000 and 2009 (Fischer, 2011). In a survey conducted by the Pew Research Center, 75% of those polled felt that college education was out of reach of most families because of the cost (Pew Research Center, 2012).

In this year of cost cutting, state legislatures around the country have not been much help; they have been cutting higher education budgets at a time when enrollments are increasing (Clark, 2011; Noblit, 2012).

The Internet has an answer to this problem: cut costs by eliminating faculty positions. A continuation of events occurring today could lead to a reduction of thousands of faculty positions. What are some of these events?

In 2011 an online course on artificial intelligence was offered by the computer science department at Stanford University by two leading experts in artificial intelligence. There was no cost for the course, and over 58,000 students from around the world registered for it. This course is one of three that Stanford offered on an experimental basis (Markoff, 2011). Technical assistance from Google and Amazon was provided for grading and online chat sessions (Chu, 2011).

The success of the initial courses at Stanford, has led to increasing the course offerings to 16 new online programs in various disciplines such as cryptography, science writing, education, mathematics, sociology, education and computer science. Other Universities like Massachusetts Institute of Technology (MIT) and University of Michigan are also developing and offering similar programs (McKendrick, 2012).

Chubb and Moe (2012) argue that, "online education will lead to the substitution of technology (which is cheaper) for labor (which is expensive). They say this new direction from learning will take time to develop, but that it is coming.

Consider the cost savings (and job reductions) if other courses in the computer science department at Stanford or other Universities are prepared by experts and offered in a similar fashion; video tutorials could be prepared and students could review them at their leisure. Students from other

universities around the country could be directed by their schools to take the courses and thus eliminate the need for those schools to offer them. Courses in other disciplines could also be prepared by experts in those fields for online delivery, and thousands of faculty positions could be eliminated. Of course some faculty members in each department at each university could be retained to teach those courses that are not amenable to the online process and to answer questions raised from the online courses. The loss of faculty positions could also result in the loss of ancillary positions and consolidation of some departments (Moe and Chubb, 2009; Chubb and Moe, 2012; Collins & Halverson, 2009).

Education online is a rapidly growing field; most universities offer some courses online, entire degrees at some traditional universities can be earned online, and there are several online universities. Students can order, pay, and track transcript requests online, and at least one university, the University of Hawaii, has held a virtual graduation (Gutierrez, 2011). Job losses could be huge as the use of the Internet increases on the college campus (Moe and Chubb, 2009; Chubb and Moe, 2012). There is the potential for state governments to save billions of dollars even though the quality may suffer. Chubb & Moe (2012) state, "all colleges will need to increase labor productivity (efficiency and effectiveness) in order to survive."

Secondary school teachers

At the secondary school level, use of the Internet will also lead to job losses. A forecast of things to come occurred in Guilford County, North Carolina during the summer of 2011. Most school districts offer summer school classes for students who

failed a course during the regular school year and wish to make it up, or who wish to get ahead. For the first time ever, no classes were offered this summer in the typical classroom setting with a teacher; instead, all of the classes were offered on-line. Thus students could complete their work at home, at the library, or anywhere else where they could access the Internet. This Internet-only approach enabled the schools to reduce the summer school budget by over $350,000; of course this savings meant that even though there were similar summer school enrollment numbers from the previous year, there were fewer jobs for classroom teachers and other school personnel who might be needed to assist the students (Glover, 2011).

Online learning has expanded substantially beyond summer school offerings. In an article in the Wall Street Journal, it was noted that 39 states have established virtual schools that allow students statewide to enroll, providing advanced placement, remedial, and other courses that might not be available at the local level (Moe, 2011). The Florida Virtual School offers a full academic curriculum, with more than 220,000 annual course enrollments, and virtual charter schools operate in 27 states with a full-time enrollment of over 200,000 students (Moe, 2011).

Attorneys

Attorneys are also in danger of losing some of their business because of the Internet. Attorneys answer legal questions for their clients, provide legal advice, prepare documents, negotiate settlements, and represent their clients in court. Some of these functions can be performed online, without a face-to-face meeting with an

attorney. Legal questions can be answered, advice can be given, and simple forms can be completed and sent by email to the client. Although, some attorneys may be able to complement or transfer their skills and jobs directly or indirectly to Internet-related jobs, the self-service attorney-related applications provide competition for traditional attorneys. There is a website, www.justanswer.com, which provides experts to answer legal questions that one might have. For a nominal fee, one can ask a legal question; an expert (an attorney with several years' experience) will obtain as much information from the client as possible concerning the issue, and provide an answer and give advice when needed. The experts are rated by individuals who submit questions, and the ratings generally range from 95% to 100% satisfaction. There is a company that provides a "Complete Case-Winning 24-hour Self-Help Course" that promises to teach one how to win in court without a lawyer (Graves, 2011). Access to the course is delivered by email for a cost of $249.00. There will be some people who will use this course to avoid hiring a lawyer, and others who will get their questions answered through the Internet. Thus, there will likely be some decrease in the need for attorneys in the future because of the internet.

Medical doctors

Physicians can also expect repercussions from use of the Internet. Physicians answer questions posed by their clients; provide medical advice; complete disability, health, and other required medical forms; and provide treatment for diseases, accidents, and other medical conditions. Answering questions, providing advice, and completing some forms can be accomplished online without a face-to-face meeting with

a doctor. Two of these websites, www.justanswer.com and www.healthcaremagic.com, allow the user to submit questions to medical experts and receive an answer and/or medical advice. Doctors from a variety of medical specialties are available to answer questions, and individuals have indicated a high level of satisfaction with the services. This portion of local physicians' practices will decline as patients become more acclimated to using the Internet for medical purposes, although physicians will certainly be needed to perform surgeries and other medical procedures.

Retail stores

Brick and mortar retail outlets are also feeling the impact of the use of the Internet. Most items that are offered for sale at shopping malls and other retail outlets can be ordered online and shipped to one's home. Shoppers find Internet purchases convenient, prices are often lower than prices on identical items at retail outlets, and in many states no sales tax is added to the total if the purchase is made from out of state (Lieber and Syverson, 2011). Although purchasers are supposed to pay their state's sales tax as a use tax at tax time, but many often do not (Lieber and Syverson, 2011). According to the U.S. Commerce Department, Internet sales increased to $165.4 billion in 2010, an increase of 14.8 % from 2009. Total retail sales, which include online sales, increased by only 7.0% in 2010. Internet sales now make up 4.2% of total retail sales, up from 3.9% in 2009 (Enright, 2011). The largest online retailer, Amazon.com, had a sales increase of 39.5% in 2010 (Brohan, 2011).

The recession and loss of business to the Internet has had a devastating effect on some retailers and their employees. They have responded by reducing the number of employees per store, reducing the number of hours employees work, and in some cases closing stores (Farfan, 2010). In 2008, more than 500,000 jobs in the retail industry were eliminated (Farfan, 2009).   Sears is an example of a retailer that has been battered by the recession and the Internet. During the second quarter of 2011, same store sales declined, it closed 29 stores and 7 product repair center locations, and it reported a loss of $146 million. Its online sales, however, increased by 32% (Talley, 2011). Many of these physical repair centers provide a point of contact for scheduling home service repairs or taking complaints or making payments.   In many instances, these functions are handled through online services.

Printing: Newspapers and Magazines

For several years, newspaper circulation, the purchase of magazines at newsstands, and magazine subscriptions have declined. According to figures released by the Audit bureau of Circulations, the declines have been widespread, with almost all of the large newspapers and many small ones suffering declines (Plambeck, 2010; Liedtke, 2011). The magazine industry has also seen a substantial decline in its advertising revenue, as advertisers recognize the drop in readership (Frier & Lee, 2012). There is less reliance on newsstands today, compared to the past, to acquire sources of information; rather, individuals use the Internet through their smart phones and computer terminals. In recognition of the trend toward use of the Internet, many newspapers and magazines now offer an online version, as well as a print version, of their papers. As online usage continues to increase, some companies will eliminate

their print versions to reduce costs (Frier & Lee, 2012). The elimination of the print versions will cost thousands of jobs, since those involved in the production and distribution functions will no longer be needed. Of course when magazines and newspapers cease publication, jobs will also be lost. Some recent examples of magazines that are no longer published in print version because of financial problems brought on by the Internet and the recession include BusinessWeek; Gourmet, the country's oldest food magazine; PC Magazine, a magazine popular with computer buffs; and Southern Accents, a magazine devoted to home decorating, entertainment, and landscaping (Ives, 2009; Frier & Lee, 2012).

Pages in the House of Representatives

For almost 200 years the House of Representatives has brought high school students to the Capital to deliver correspondence, packages, and phone messages to lawmakers and their staff members. The pages were usually high achieving juniors, sponsored by their members of Congress; they spent a semester living and working in Washington, DC, learning about the intricacies of the legislative branch of government. The House has decided to end its page program because the use of e-mail and other technological advances has rendered the program superfluous (Glueck, 2011). The demise of this program will not have any impact on job losses in the economy, but it is one more indication of the impact of the Internet on the decreased need for individuals to perform certain tasks.

Messenger Services

The use email and fax machines have reduced the need for local messenger services, where letters and other documents are delivered within a city or county. The messengers were often young men in their 20s or early 30s who made their deliveries by bicycle. These messengers have largely disappeared. To remain in business, these messenger services have expanded their operations to include ship by air service, medical deliveries, lost luggage retrieval, printing materials, and package deliveries of all sizes (Devantier and Turkington, 2006).

Conclusions

Progress cannot be stopped; throughout our history technological change has destroyed some jobs and created others. In the 1800's farriers were hired to make and place shoes on horses' hooves. But today travel by automobile, air, and train has practically eliminated the need for farriers. The transportation industry, though, has created thousands of jobs that did not exist earlier. In the 1940s and early 1950s elevators required the use of an elevator operator; someone had to open and close the elevator doors manually and stop the elevator on the appropriate floors. The introduction of the automatic elevator, however, has eliminated the job of the elevator operator. In recent years a company called InstyMeds has developed a machine that dispenses prescription medication. The machine has been installed in 33 states and Washington, DC, and it has been approved by the federal Drug Enforcement Agency and appropriate state regulators

(Sennott, 2011). The machine cannot counsel patients, but there will be a decrease in the need for pharmacists if use of the machines becomes widespread.

The use of the Internet has created more efficient methods of distributing and obtaining information than existed 30 years ago. An unintended consequence has been the elimination of thousands of jobs in a variety of industries. Unlike job losses due to the recession, most of these jobs are not coming back as the economy recovers. Even when companies begin to hire again, they may place their part-time employees into full-time positions, thus having no impact on the official unemployment rate (Leonard, 2011). We are also likely to see little or no hiring at the federal, state, or local government levels with the spending-cutting legislators now in power. It appears, then, that extraordinary job creation efforts will be necessary if there is to be a dent in the unemployment rate.

The growth of the Internet has certainly created some jobs: Internet providers, web developers, programmers, and security personnel. But the number of new jobs created is substantially less than the number of job losses. In light of the continuation of high levels of unemployment, the significance of the Internet, displaced workers and disintermediation warrants consideration in the challenge and consideration of strategies to reduce unemployment rates.

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TOWARD DIVERSITY IN STEM WORKFORCE: AN EXAMINATION OF EARLY CAREER INTERESTS ACROSS GENDER, ETHNICITY, AND ACADEMIC PERFORMANCE VARIABLES

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The purpose of this study was to advance knowledge about the critical workforce shortage in Science, Technology, Engineering, and Mathematics (STEM) fields by looking at how early career interests change in relation to academic performance, ethnicity, and gender. A longitudinal examination of archival data from Memphis City school students (n=2813) incorporated the Technical and Science-Technology dimensions of STEM-related career interests. We found that differences in gender, ethnicity, and academic performance were all related to the changes in early STEM career interests. While the overall group's Technical interests decreased and Science-Technology interests increased from the 8th to 10th grade, the changes in students' career interests were differentiated across our variables. Exploring changes in STEM career interests at earlier stages and in the context of personal differences helps not only to illuminate the roots of STEM workforce shortage as a phenomenon but also to address the disproportionately low levels of women and minorities in STEM careers.

Introduction

There is a broad and sustained societal consensus that one of the long-term keys to continued U.S. competitiveness in an increasingly global business environment is the adequate supply of a high-quality workforce in Science, Technology, Engineering, and Mathematics (STEM) fields (American Institute of Chemical Engineers, 2006; Jacobs, 2005; Kelly, Kofner, & Rippen, 2003; Holt, Colburn, & Leverty, 2011; Lynn, Salzman, & Kuehn, 2011; Obama, 2012; Sokol, 1994). Business demands to identify sustainable paths for supplying this workforce have been largely unanswered in the business and psychology

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scholarship, despite the traditional sources of STEM labor being increasingly insufficient. Significant barriers remain in engaging women, for example, in technology fields (Diekman, Brown, Johnston, & Clark, 2010; Lemons & Parzinger, 2007), and sizable gaps are still present in understanding how to broaden early STEM-related academic achievement, foster its links to the STEM career interests, and translate these interests into lasting STEM career choices and positive attitudes across ethnicities and genders (Zarrett & Malanchuk, 2005). Previous research provided numerous static pictures (i.e., based on data from one point in time) related to broad STEM interests, and it mostly involved adults and college or senior-high-school students who might have already made some important commitments toward vocational choices (e.g., Leuwerke, Robbins, Sawyer, & Hovland, 2004). Few researchers, however, tackled the malleability of these choices at earlier life stages, even though career interests are assumed to start developing and changing as early as in middle school (Wimberly & Noeth, 2004). As recent studies point to the usefulness of attending to STEM career development during school years (e.g., Schmidt, Hardinge, & Rokutani, 2012), business scholars interested in lasting solutions for economic prosperity of society should deeper engage in the exploration of career interests throughout the lifespan. Our study attempted to create and contextualize an understanding of how early STEM career interests develop over time in relation to academic performance, ethnicity, and gender, and in doing so, invite other business researchers to focus on the dynamic nature of such development and on enabling context-appropriate, workable recommendations for fundamental solutions to the STEM workforce shortage.

Current Workforce Shortage and Interests in STEM Fields

Scientific innovation has produced roughly half of all U.S. economic growth in the last 50 years (National Science Board, 2010), and the STEM fields—and those who work in them—are considered the critical engines of such innovation. According to one estimate, while only about 5% of the U.S. workforce is employed in STEM fields, the STEM workforce contributes to more than 50% of the nation's sustained economic growth (Babco, 2004). The increasing globalization and complexity of modern business further strengthens the demand for STEM professionals. However, there is a serious worker shortage in these fields, and the production of American scientists and engineers is alarmingly low (RAND Corporation, 2006; Costa, 2012). A recent survey of manufacturers (The Business Journal, 2012) indicated that one-third of them were experiencing shortages of engineers and scientists even at the height of the economic recession. On the other hand, The Business Roundtable (2005) warns that if current trends continue, in the near future more than 90% of all scientists and engineers in the world will live in Asia, escalating competitive disadvantages of the Unites States and other traditional knowledge economies with a comparatively diminishing supply of STEM professionals. As a result of STEM labor shortage, the U.S. stands to experience reduced tax revenues, lower standards of living, and a weakening domestic market for STEM-dependent goods and services. Once this cycle accelerates, it will be difficult to regain the lost preeminence in technology-driven innovation and its economic benefits.

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To deal with the inherently interdisciplinary issue of STEM labor shortage, numerous efforts have been made in the educational field and research (e.g., Baram-Tsabari, & Yarden 2011; Cantrell & Ewing-Taylor, 2009; Hall, Dickerson, Batts, Kauffmann, & Bosse, 2011), with the business research seemingly lagging in reciprocity. Business community leaders, especially from the STEM-dependent companies, have been aligning their efforts to address the growing challenges for America's future STEM workforce through a number of actions in practice (Swanson, 2013). These actions include facilitating and promoting STEM education through private and public partnerships, developing an inventory of employment skills needed by the business over the next decade, engaging employers in promoting innovative STEM programs in all 50 states, and improving attitudes of the general public toward STEM professionals and career choices. As unambiguously expressed by Richard Stephens, a senior official at Boeing, "We need to take aggressive and unified steps together in order to ensure that in 2020 our workforce is prepared to keep our nation strong and competitive" (AIA News, 2010, p. 4). However, there is a paucity of empirical research guiding or supporting these practical business efforts in general and targeting the early STEM career interest development in particular.

The urgency in the current public discourse brought to light multiple possible reasons for the STEM workforce shortage (e.g., poor domestic preparation, unfavorable career stereotypes) and several politically volatile, macro-level proposals to immediately address it in practice (e.g.,

student aid policy incentives, immigration reform targeting foreign talent). The arguably more lasting, micro-level approaches, however, might emerge from systematically and longitudinally investigating when and how the STEM career choices develop and change in the diverse contexts of personal differences (National Science Board, 2010). Our research advances a fundamental, strategic focus on early interests in STEM careers and takes new empirical steps to examine how these interests change in relation to academic performance and diversity variables.

Specifically, we looked at vocational interests as early as in middle-to-high school and contributed a differentiated understanding of how these interests developed over time. We used longitudinal data from the archived assessments of urban middle and high school students' exploration of occupations and career planning, and we investigated the relationships among the students' STEM-related interests and their ethnicities and genders, in the context of academic performance in math and science. Several prior studies examined the relationships between math/science and science-related career interests (Lopez, Lent, Brown, & Gore, 1997; O'Brien, Martinez-Pons, & Kopala, 1999; Rask, 2010; Arcidiacono, Hotz, & Kang, 2012), but they focused on investigating these relationships among the samples of adults (e.g., college students) or at only one point in time, rather than investigating the dynamics of how the changes in adolescents' academic performance are related to the changes in their corresponding career interests over time. Previous research also provided some insight into the impact of ethnicity, gender,

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or academic performance on career interest development (e.g., Fouad & Smith, 1996; Wu & Jing, 2011), but no studies determined whether or not the changes in some factors, such as changes in academic performance in math and science, moderate or mediate the gender and ethnicity influences on STEM career interests over a period of time. Another important research gap was previously identified by Tracey, Robbins, & Hofsess (2005): despite the mainstream career development theories addressing career interest changes over time and generally agreeing that, with increasing age, adolescents are expected to better align their career choices with their interests, little research looked into the prediction of specific early career interest development. Tracey et al. (2005), however, focused on the general pattern of stability and change in a broader range of interests among adolescents and did not focus on examining STEM career interests. To our knowledge, the present study is the first longitudinal investigation to address the impact of the interaction of gender, ethnicity, and academic performance variables and early development of specific interest in STEM careers among adolescents.

Our findings give rise to a necessarily more detailed view of how potential knowledge workers differ in developing their STEM career inclinations at early lifespan stages. Students self-identified as black, for example, differ from those self-identified as white in accelerating their STEM-related interests from grade 8 to grade 10, depending on their math-and-science academic performance. In the same performance context, female 10th graders pick up on these interests at a pace surprisingly different from that of male 10th graders. Long standing equality concerns around the adequate

preparation of women and minority STEM professionals (Brown & Campbell, 2009; Clewell & Campbell, 2002; Holden, 1989; National Research Council, 2006; Payton, 2004) bring another level of urgency to addressing STEM labor shortages in more focused than general ways. Our study therefore also answers the National Science Board's (2010) challenge for an early-interest trend identification and a timely and informed intervention by illuminating the possibility for a strategic path to more customized STEM workforce-supply solutions and targeted nurturing of interest in STEM careers.

Many students never make it into the STEM pipeline because of inadequate preparation in math and science (Byars-Winston, Estrada, Howard, Davis, & Zalapa, 2010), some are disappointed by the demanding workload and relatively low salaries in STEM fields compared to other professions (Public Workforce System, 2007), and many do not develop their early career interests in these fields. Because career interest is one of the factors that determine an individual's career choice, it is important to examine the business issue of workforce shortage in STEM fields by looking at the development of career interests. When do a person's career interests actively develop in his or her life, and when does this development plateau? Scholars are inconsistent in addressing these questions. For example, literature on the person-environment fit (Blau, Gustad, Jessor, Parnes, & Wilcock, 1956; Assouline & Meir 1987; Spokane, 1985) supports the view that vocational interests change over time; and individuals, especially adolescents, become more realistic (cf., idealistic) in their choices with increasing age. According to Wimberley and Noeth

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(2004), however, students start to have occupational interests as early as in the 8th grade, but there is relatively little change in these interests through the 12th grade. Developmental psychologists provide an additional point of reference by highlighting the even earlier influences of childhood environments (e.g., parental occupations) on early vocational inclinations (e.g., Weisgram, Bigler, & Liben, 2010).

While furthering the consensus on the timing of career interest development is important, so is distinguishing career interest development across basic differences (e.g., gender, ethnicity). We view the attunement to group differences in developing early STEM career interest as a key research focus for producing results currently relevant for competitive business strategy on the enterprise and national-economy levels. Knowing if and how early STEM career interest changes in middle and high school might illuminate the path to addressing the current workforce issue in the STEM fields. The Unisex Edition of the American College Testing (ACT) Interest Inventory (UNIACT) provides a means to identify personal career interests for students in the early stages of career planning or re-planning.

Measuring Early Career Interests of High School Students: UNIACT Interest Inventory

The goal of career (i.e., occupational, vocational) interest measurement is to help people identify careers that they would enjoy in the future. Prediger (1971) suggested that although vocational interest development is a continuous process, it occurs through a sequence of choices. Each choice involves a

preparatory stage that ideally includes a period of exploration and information gathering as a prelude to the decision. Particularly for high—including junior high (i.e., middle)—school students, the period of exploration has important implications for later college and major choices. The role of an interest inventory in career decision-making is twofold. First, the results of an interest inventory provide a description of the individual's interest information that can facilitate self-exploration. Descriptive information may be used to help students understand themselves and to organize information about themselves. The second major role of the interest inventory in educational and career decision making is to facilitate focused exploration of the world of work (Prediger, 1999). Focused exploration does not single out the specific college major or career choices for a person; rather, it intends to point to general areas for consideration. High school students, however, have a limited time to explore and keep multiple available options open, especially when the careful curriculum planning pressures intensify as they near graduation or target specific college-bound courses. The key expectation the societal stakeholders—including the business community—place on career interest measurement and vocational counseling is to help students identify and explore personally relevant options early. Thus, the research utilizing career interest measurement can potentially assist students in focusing their vocational exploration.

Although the reasons for completing a career interest inventory vary, most people want to identify vocational fields, or occupations, in line with their everyday likes and dislikes. Without broad occupational

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experiences, which few students have, how can they make the informed career decisions? How do their preferences relate to the world of work? Even though there are multiple assessment tools for identifying and measuring career interests (see for a recent STEM-specific example Tyler-Wood et al., 2010), the UNIACT is one of the more uniformly recognized instruments that was rigorously designed to help students see the connection between the world of work and the common everyday things they like to do (Discover Research Report, 2006). It was introduced in 1977, and revised in 1989, for the purpose of measuring career interests, and it is based on Holland's Vocational Preference Inventory (VPI) model (Holland, 1963a, 1963b,1963c, 1966, 1973), which is widely accepted as foundational for identifying interests that span from adolescence to the world of work and organizations (Latack, 1981).   UNIACT contains 15 items for each of its six scales— 90 items in total—and uses a three-choice response format (i.e., dislike, indifferent, like). "UNIACT's items emphasize work-relevant activities (e.g., fix a toy, conduct a meeting) that are familiar to people, either by participation or observation" (ACT, 2012, p. 3).   As noted by Kuder (1977), the less accurate knowledge people have about various occupations, the more help they need with career planning. Students are required to take the UNIACT interest inventory survey as part of the test protocol when taking either the EXPLORE test in grade 8 or the PLAN test in grade 10. EXPLORE and PLAN are specifically designed by American College Testing (ACT) for 8th grade and 10th grade students, respectively, for the purpose of measuring students' academic progress. Both tests cover the subjects of English, math, science, and social studies, each of which could be studied

separately. Data resulting from applying the combination of these measures presented a fertile ground for our longitudinal investigation of the relationships between career interests and academic performance.

Hypotheses Development

Social Cognitive Career Theory (SCCT) (Lent, Brown, & Hackett, 1994) proposes that academic progress is a developmental complement to career initiation and growth and that the interests and skills forged during school years shape the career-related choices. It suggests that academic achievement should be predictive of relevant career interest. Evidence from the application of some career-interest measurements has been found to support the SCCT model. For example, Yang, Mo, and Dolar (2012) revealed that math performance plays an important role in the development of accounting career interest. Smith (2002) found that the specific mastery experience in information technology was a significant predictor of information-technology interests of undergraduate students. Other studies (Tracey & Robbins, 2005; Tracey et al., 2005) examined if academic performance at one point in time is predictive of career interest at a later point, and found no incremental influence of academic achievement on interests once prior interests had been taken into account. However, because a student's academic performance might change from one year to another, it is important to examine the dynamics of how the changes in students' academic performance over time relate to the changes in their career interests over the same period of time. We propose that the dynamic changes in their STEM-related academic performance are predictive of changes in their relevant career interests.

Hypothesis 1: The change (increase or decrease) in STEM career interests of school students from 8th grade to 10th grade is positively related to the same-direction change in their math and science academic performance.

Psychology researchers increasingly raise and look at vocational concerns around gender and ethnicity differences in career interests in general (e.g., Fouad et al, 2010; Hudek-Knezevic, Tkalcic, & Kardum, 1995) and STEM-related career interests in particular (e.g., Diekman, Clark, Johnston, Brown, & Steinberg, 2011; Lent, Lopez, Lopezc, & Sheua, 2008). A matter of increasing concern to business and societal stakeholders as well is a relatively low number of scientists and engineers who are women or members of minority groups (e.g., Cassell & Slaughter, 2006; Beede et al., 2011; Hill, Corbett, & St. Rose, 2010). Women and minorities, combined, recently represented only about 6% of the nation's engineers and scientists (O'Brien et al., 1999). As women and minorities are about 50% and 30% of the U.S. population respectively, there are increased societal and economic pressures to focus on examining potential contributions of these groups in light of the resource shortage in the STEM professions. The reasons why only a small number of women and minorities work in the STEM fields are complex, even though we generally understand that there are differences, for example, in science interests and achievement between genders (Johnson, 1987; Jovanovic, Solano-Flores, Shavelson, 1994). Some studies focusing on adults (e.g., Wu & Jing 2011; Griffith, 2010) examined gender or race differences in relation to careers and career interests. Very few studies (Levine & Zimmerman, 1995;

Tracey et al., 2005; Yang et al., 2012) examined similar issues with a focus on adolescents, and none had a longitudinal approach to interrelated dynamics of academic performance, gender/ethnicity, and STEM career interests employed in this study. Tracey et al. (2005), for example, based on the UNIACT career interest inventory data at a specific point in time, demonstrated that female high-school students scored significantly higher than male counterparts on the Social and Artistic dimensions and lower on the Realistic one, and there were differences by ethnicity in each dimension in Holland's model, except for the Realistic one. Using a different one-time career interest survey, Oppler (1993) additionally found that male students rated quantitative and scientific occupations significantly higher than females.

As a next step important to the business phenomenon of STEM workforce shortage, we specifically questioned if the gender or ethnicity difference in early STEM career interests is related in any way to the change in academic performance over a period of time. We found no studies that answered whether or not the changes in academic performance in math and science moderate or mediate the gender and ethnicity differences in STEM career interests in a later period. The test for an interaction effect between the variation in academic performance and either gender or ethnicity might provide important information toward how academic performance moderates the differences of gender and ethnicity in relation to the STEM career interest preference. If academic performance is indeed related to the shifts in career aspirations, more effort should be made to improve students' performance in math and science in order to

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develop their STEM career interests and encourage them to explore beyond traditional gender-typed (Heilman, Wallen, Fuchs, & Tampkins, 2004; Su, Rounds, & Armstrong, 2009) and minority-typed (see e.g., Wu & Jing, 2011) occupations. The exploration of this issue will help business stakeholders, educators, counselors, and parents focus on the key intervening processes dealing with the groups of students who are traditionally less involved in STEM careers.

Hypothesis 2a: Changes in math and science academic performance have an impact on the students' gender difference in STEM career interests from the 8th to 10th grade.

Hypothesis 2b: Changes in math and science academic performance have an impact on the students' ethnicity difference in STEM career interests from the 8th to 10th grade.

Methods

Archival student assessment data from the Memphis City Schools were used in this study. The data came from 2813 students—black and white ethnicities only—who took the EXPLORE test in the 2006-07 school year when they were 8th graders, and then took the PLAN test in the 2008-09 school year when they were 10th graders. Of these students, there were 1669 females and 1144 males, and, when broken down by ethnicities, 2357 black students (1437 females and 920 males) and 456 white students (232 females and 224 males). This sample afforded us an opportunity to explore gender and ethnicity differences while investigating the relationship between academic performance and early career interests over time.

Data and measurements

The archival data we used included two parts. The first part contained the students' academic performance scores from the EXPLORE and PLAN tests for the 8th and 10th grade administrations. The range of possible scores in each subject on the EXPLORE test was from 0 (lowest) to 25 (highest), and the range of possible scores in each subject on the PLAN test was from 0 (lowest) to 32 (highest). Because the original scale scores for each academic subject were different at two different test time points, the measurement of percentile-based ranks among students was used instead of original scores, to gauge the differences in academic performance.

The second part of the archival data we used contained the information from the UNIACT Interest Inventory collected from the EXPLORE and PLAN tests during the same two administrations. The score difference in career interests in each of the STEM-related dimensions between the EXPLORE and PLAN tests was used to conceptualize changes in career interests. There were six sets of scores from the six career dimensions (ACT 2012), representing the development of career interests from 8th grade to 10th grade. However, we only focused on two dimensions (i.e., types of interest)—Technical as well as Science and Technology—in addressing our research questions about the early career interests relevant to STEM. According to Holland (1966), the Technical type prefers work that requires technical, mechanical, physical, or athletic skill. In the UNIACT interest inventory, examples of Technical-related career interests include "operating electronic equipment, writing instructions on how to operate a machine, assembling a cabinet from

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written instructions, and inspecting products for defects"(ACT, 2012, p.3). The Science-Technology type is scientific, task-oriented, likes to learn, observe and analyze, and prefers to do work that requires abstract thinking and creative problem-solving. Examples of Science-Technology related career interests include "studying biology (or the causes of earthquakes, plant diseases, the effects of vitamins on animals, etc.), using personal observations to predict the weather, learn how the brain works (or how birds migrate)" (ACT, 2012, p.1), and so forth.

Developing a multilevel mixed model of early career interest changes

We used the individual growth modeling techniques (Rogosa & Willett, 1985; Singer, 1998; Willett, Singer, & Martin, 1998) to analyze the longitudinal data. All analyses were conducted using SAS PROC MIXED, a full maximum-likelihood method:

$$Interests_{it} = \pi_{0i} + \pi_{1i}Year_{it} + $$
$$\pi_{2i}$$
$$Academic_{it} + \varepsilon_{it} \quad (1)$$
$$\pi_{0i} = \beta_{00} + \mu_{0i}$$
$$(2)$$
$$\pi_{1i} = \beta_{10} + \mu_{1i}$$
$$(3)$$
$$\pi_{2i} = \beta_{20} + \mu_{2i} +$$
Gender$_i$ +

$$\beta_{22}Ethnicity_i + \mu_{2i} \quad (4)$$

:pendent variable, interest in year t. the academic r t, and π_{2i} is the ic performance, :cept π_{0i} and the linear year effect (rate of change)π_{1i}. The regression coefficients β_{00}, β_{10}, and β_{20} are the termed fixed effects for the mean interests score, mean change rate, and mean academic

performance, respectively. β_{21} and β_{22} indicate the effects of gender and ethnicity. When Equations (1), (2), (3), and (4) were combined, we used the resulting equation for the changes in STEM career interests as follows:

$$Interests_{it} = \beta_{00} +$$
$$\beta_{10}Year_{it} +$$
$$_o$$

Results

Table 1 summarizes the mean academic performance in math and science and mean career interests by grade and gender and ethnicity. When at 8th grade, female students had higher scores than male students in both math and science subjects, but lower career interests on both Technical (Interests 1) and Science-Technology (Interests 2) dimensions; white students had a higher academic performance in math and science and higher career interests in the Technical dimension—but lower career interests in the Science-Technology dimension—than black students. When the students were in 10th grade, the male and female students achieved almost the same mean performance in math, and female students had a higher science performance than male students, but male students had higher career interests in both the Technical and Science-Technology dimensions. At the same time, white students scored higher on the academic performance in both math and science and were somewhat higher in the Technical interest dimension—but lower in the Science-Technology interest dimension—than black students.

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We then examined initial career interests by gender and ethnicity at 8th grade and found that there was a significant gender difference as well as race difference on the Technical dimension, $F=11.45$, $p<0.001$ and $F=71.07$, $p<0.001$, respectively. However, we found neither gender nor ethnicity differences on the Science-Technology dimension, $F=0.39$, $p>0.05$ and $F=0.72$, $p>0.05$, respectively. We then used a hierarchical growth model (Rogosa & Willett, 1985; Singer, 1998; Willett, Singer, & Martin, 1998) to test how the development of STEM career interests was affected by academic performance in math and science as well as by gender and ethnicity (see Tables 2 and 3).

Table 1
Summary of Average Academic Performance and Career Interests Scores

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
	8th grade				*10th Grade*			
Subject	*Male*	*Female*	*Black*	*White*	*Male*	*Female*	*Black*	*White*
Math	60.14	61.95	59.08	85.13	58.66	58.45	56.28	83.58
Science	58.77	62.85	59.37	83.1	56.85	59.24	56.37	80.17
Inter. 1	55	45	49	56	62	50	55	56
Inter. 2	59	58	59	57	58	57	60	57
Note: Inter. 1 represent career interests alongside the Technical dimension								
Inter. 2 represent career interests alongside the Science-Technology dimension								

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Table 2
Growth Model Results for the Technical Interests Dimension

		Math as time covariate				Science as time covariate			
Predictor		Est.	SE	t	E.S.	Est.	SE	t	E.S.
For base rate									
Intercept	β_{00}	64.07	1.41	45.44**	0.01	63.87	1.38	46.36**	0.05
For linear change									
Intercept	β_{10}	-5.27	0.75	-6.87**	0.27	-5.2	0.76	-6.94**	0.06
For achievement change									
Intercept	β_{20}	-0.05	0.02	-2.24*	0.33	-0.05	0.02	-2.43**	0.37
Gender	β_{21}	-9.91	1.79	-5.52**	0.65	-12.21	1.78	-6.87**	0.27
Race	β_{22}	4.59	5.71	0.8	0.22	2.86	4.89	0.58	0.02
Note: Est. indicates estimated value									
E.S. indicates local effect size Cohen's f^2 (Selya et al., 2012)									
*p<0.05. **p<0.01									

Table 2 represents the results of hierarchical individual growth analyses in examining career interests alongside the Technical dimension. We considered math performance as a time covariate in the relationship between Technical career-interest changes and gender and ethnicity variables, and we found several interesting results. First, the career interests in the Technical dimension changed significantly from 8th grade to 10th grade for the entire group, as the average student began with a score of 64.07 at 8th grade but lost 5.27 points at 10th grade. Second, math academic performance was negatively related to the development of Technical career interests overall, $\beta_{20} = 0.05, t = -2.24.$ Third, once math performance was controlled, the mean difference in Technical interests at

10th grade between male and female students was significant, β_{21}=-9.91, t=-5.52, where female students had lower Technical interests. Finally, when math performance was controlled, the average difference in Technical interests at 10th grade between white and black students became non-significant, β_{22} =4.59, t=0.80.

We then assessed the role of science performance as a time covariate in the relationship between Technical career-interest changes and gender and ethnicity variables. We found that career interests in the Technical dimension changed significantly from 8th grade to 10th grade overall—the average student began with a score 63.87 at 8th grade but lost 5.20 points at 10th grade. Science academic

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performance for the whole group was shown to be negatively related to the development of Technical career interests, $\beta_{20} = -0.05, t = -2.43.$ When science performance was held constant, however, gender differences in the Technical dimension at 10th grade remained significant, β_{21}=-12.21, t=-6.87, but ethnicity differences became non-significant, β_{22} =2.86, t=0.58.

Table 3 summarizes the results for career interests alongside the Science-Technology dimension. When examining math performance as a time covariate in the relationship between Science-Technology career interests and gender and ethnicity variables, we found that career interests in

Science-Technology increased significantly from 8th grade to 10th grade overall, as the average student began with a score 53.85 at 8th grade and increased 0.29 points at 10th grade. The change in math academic achievement was significantly and positively related to the development of Science-Technology career interest for the group as a whole, $\beta_{20} = 0.27, t = 4.45.$ The higher the math performance, the higher the Science-Technology career interest. Once math performance was held constant, the gender difference remained non-significant at the 10th grade (as it was at 8th grade), β_{21}=0.56, t=0.32. Meanwhile, with math performance controlled, the ethnicity difference became significant, β_{22} =21.85, t=4.06—black students showed stronger career interests in Science-Technology than white students did.

Table 3
Growth Model Results for the Science-Technology Interests Dimension

Predictor	Math as time covariate				Science as time covariate			
	Est.	SE	t	E.S.	Est.	SE	t	E.S.
For base rate								
Intercept β_{00}	53.85	5.32	10.12**	0.01	55.37	1.32	41.98**	0.03
For linear change								
Intercept β_{10}	0.29	0.73	0.41	0.07	0.26	0.73	0.36*	0.05
For achievement change								
Intercept β_{20}	0.27	0.06	4.45**	0.16	0.07	0.02	3.32**	0.78
Gender β_{21}	0.56	1.73	0.32	0.07	-1.05	1.69	-0.62	0.08
Race β_{22}	21.85	5.38	4.06**	0.32	19.27	4.56	4.23**	0.41
Note: Est. indicates estimated value								
E.S. indicates local effect size Cohen's f^2 (Selya et al., 2012)								
*p<0.05. **p<0.01								

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When examining science academic performance as a time covariate, we found that career interests in Science-Technology increased significantly from 8th grade to 10th grade overall—the average student began with a score of 55.37 at 8th grade, which increased 0.26 points at 10th grade. Science academic performance changes were positively related to interest development in Science-Technology for the entire group, $\beta_{20} = 0.07, t = 3.32.$ When science academic performance was held constant, there was no gender difference in Science-Technology at 10th grade, but significant differences in ethnicity were found, β_{22} =19.27, t=4.23—where black students again showed stronger interests than white students in Science-Technology.

Discussion and Implications

Our first research focus was on investigating the relationships between early STEM career interest development and math and science academic performance. When students were taken as a whole, they demonstrated a significant change toward both Technical and Science-Technology career interests from grade 8 to grade 10. More specifically, the change turned in two different directions. Over the two-year period, the students' Technical career interests decreased, while their career interests in Science-Technology increased. When looking at the development of career interests in relation to academic performance, the results were mixed. The change (e.g., decrease) in

Technical career interests was negatively related to the same-direction change in academic performance in both math and science; however, the change in Science-Technology career interests was positively related to the same-direction change in math and science academic performance. Hypothesis 1 was therefore supported for the Science-Technology interests and reversed for the Technical interests. One explanation for that might lie in plain sight of curricular and cognitive development. During the high school years, students are increasingly exposed to more advanced science-related courses that invoke abstract thinking. While technical work depends more on practical operation rather than abstract cognition, the Science-Technology career is more closely associated with advanced knowledge and higher-level thinking normally developed in math and science courses. Students appear to be more interested in vocations related to the abilities they successfully demonstrate. Our findings might therefore indicate that the overall changes in students' STEM career interests are consistent with the usual curriculum development as well as with the students' cognitive growth. We, however, also offer more contextual details related to Hypothesis 1 by providing in Table 1 a breakdown of the results alongside gender and ethnicity differences.

Our second research focus was on investigating if the changes in math and science academic performance had an impact on the gender and ethnicity difference in early career-interest changes

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from 8th to 10th grade. In Hypothesis 2a, we looked for an impact of changes in academic performance on the gender difference in early STEM career interests changes from 8th to 10th grade, such that the changes in academic performance would, for example, impact the gender differences in STEM career interests at a later period. We found that, at 8th grade, there were significant gender differences on the Technical dimension, but not on the Science-Technology dimension. With changes in academic performance from 8th grade to 10th grade, at 10th grade, students still maintained a gender difference on the Technical dimension, and the gender differences remained insignificant on the Science-Technology dimension. Therefore, no evidence was found in support of Hypothesis 2a.

In testing Hypothesis 2b, however, we found an impact of changes in academic performance on the career-interest difference by ethnicity. At 8th grade, there were significant ethnicity differences on the Technical dimension, but not on the Science-Technology dimension. With changes in academic performance from 8th grade to 10th grade, the ethnicity difference on the Technical dimension at 10th grade disappeared once math or science academic performance was controlled. On the other hand, the ethnicity difference in Science-Technology career interests became significant when math or science was held constant—black students now had higher interests in Science-Technology than the white students did, which provided support for Hypothesis 2b.

The results of this study have important implications for practice and research around the phenomenon of STEM

workforce shortage. First, early career interests are changeable during the middle and high school years. We side with those who suggest that influential societal actors (e.g., business stakeholders, educators, parents) can help adolescents nurture and sustain their career interests in STEM fields. Second, because academic performance has an impact on changes in Science-Technology interests, an increased emphasis should be placed upon strategies for improving students' performance in math and science as a way to strengthen their career interests in the Science-Technology fields. Third, the nurturing of successes in math and science academic performance might have an especially salient effect on black students' early Science-Technology career interests. There were gender and ethnicity differences in Technical career interests at 8th grade— male students in our study were more interested than female students, and black students were more interested than white students, in activities which required operation ability. Two years later, males still showed higher vocational interests than females, but black students became no more interested than white students, in the Technical career domains. On the other hand, there were no gender and ethnicity differences in Science-Technology career interests at 8th grade. However, two years later, as a result of the effect of the academic performance, there was again no gender difference, but a significant ethnicity difference—black students demonstrated higher interests in Science-Technology than white students did. These findings also challenge an assumption that white students have stronger Science-Technology interests than black students do, and suggest that more white students may choose careers in STEM due to other factors than their early career interests in STEM.

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Limitations and Future Directions

Our study's limitations help us bring attention to future research directions. First, our sample was limited on the important dimensions of diversity and geography. We drew on the gender differences between young men and women, but we only considered the ethnicity-related difference between students self-identified as black or white in a predominantly black student sample, with more than half of the entire sample represented by black female students. We expect that more complex dynamics in early STEM career interests will surface if future studies include investigation across a wider array of differences as well as interactions among these differences. Considering the related interests of Asian women, for example, might illuminate a unique complexity for the group that remains a relatively out-of-focus STEM minority within a larger group (i.e., Asians) perceived as well represented in STEM careers (Wu & Jing, 2011). Our sample was also limited to one urban school district. Sampling across different U.S. locales and internationally, while replicating our methods, will also increase the geographic reach of the strategic focus on early interests in STEM careers.

Second, we looked only at the differences between two points in time, 8th and 10th grades. While it was important to initiate this longitudinal exploration and find the differentiators in early STEM career interests, it would be valuable to collect more longitudinal data for the same group of students when they were in 12th grade and beyond. Such research would contribute to our understanding of how STEM career interests change from grade 8 through high school and into college, throughout the most formative years in career interest development and into the stage of job market entry.

Third, we envision a set of qualitative differences—not addressed in our quantitative investigation—as opportunities for future exploration of contexts surrounding the development of STEM career interests. Recent research indicates that same-group exposure (e.g., Hispanic students to Hispanic STEM professionals) and nurturing are important for developing and sustaining STEM career interests not only in the work settings (see e.g., Friedman & Holtom, 2002; Mavriplis et al., 2010) but also in earlier, school stages (see e.g., Brown & Campbell, 2009; Payton, 2004). There is also a mounting body of evidence for positive effects of STEM-targeted intervention and counseling (e.g., Fouad et al., 2010; Jacobs, Davis-Kean, Bleeker, Eccles, & Malanchuk, 2005), for which many parents and school counselors may not be adequately prepared (Hall, Dickerson, Batts, Kauffmann, & Bosse, 2011). We have not addressed the impact of school career-counseling quality (Perry, Liu, & Pabian, 2010) on our results, and we wondered if any exposure to STEM field professionals or STEM-related businesses affected the development of early career interests. How did the parental employment or home environments (Post-Kammer & Smith, 1986) of the students in our sample influence the changes in STEM career interests? What STEM-related

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stimuli (e.g., ethnic-theme campus fairs, same-gender STEM professional's mentoring) are most effective for sustained improvement in STEM career interests? These and other relevant questions might encourage the contextual explorations that further differentiate and enrich the understanding gained from our study. As a result, this line of research might further the important practical insights into how to make STEM career interests personally meaningful and desirable at early developmental stages among the breadth of vocational interests (Johnson & Stokes, 1999).

Conclusion

Most studies on career-interest development focused on adults, and little is known about early career interest change— including strategically important STEM-related change—for adolescents, and about how academic performance changes are related to the changes in specific career interests. Our study adds new knowledge about the changes in academic performance influencing the changes in the early STEM career interest preference from the 8th to 10th grade, and about academic performance interacting with the gender and ethnicity differences for students with these career interests. The results of this study revealed that ethnicity and academic performance were related to changes in early career interests in the Technical and Science-Technology domains. At 8th grade, male students showed significantly greater interests than female students, and white students showed greater interest than black students, in the Technical career interest dimension, but there was no evidence about gender and ethnicity differences in the

Science-Technology dimension. Two years later, with the impact of math and science performance, male students still exhibited stronger interests than female students, but white students showed the same level of interests as black students, in the Technical interest dimension. Meanwhile, no gender difference was found, but black students showed greater interests than white students in the Science-Technology dimension while in 10th grade. Cumulatively, our findings contribute to initiating a robust scholarly conversation on the intersection of business, education and psychology about broadening the base and diversity of STEM workforce supply and illuminating sustainable ways for early identification and nurturing of future STEM professionals whose work attitudes, behaviors, and values may also differ from previous generations (Loughlin & Barling, 2001). This conversation might not only address an urgent business need and societal phenomenon but also open up another path for women and minorities to leadership and management roles (Morrison & Von Glinow, 1990) in the professional fields where they are currently and significantly underrepresented.

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SOCIALLY RESPONSIBLE BRANDS:
AN ASSESSMENT AMONG MILLENNIALS

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In a recent article, Philip Kotler points out that more marketers are gaining a conscience as they realize the importance of "Marketing 3.0;" that is, the practice of responsibly caring "about the health and welfare of their customers and society at large" (Kotler, 2012). In this paper, we examine the top "green" brands; that is, those companies and/or brands that are noted for their environmental sustainability and compare them to the spontaneous recall of brands by those in the millennial segment. We find that there is very little relationship between the two lists generated suggesting that companies, though they may be practicing corporate social responsibility, are not yet recognized by Millennials as doing so.

Introduction

Sustainability, the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987), is gaining traction as a strategic business goal (Engardio, Capell, Carey, and Hall, 2007). Previously and parallel with this trend, research in marketing strategy on corporate social responsibility (Brown and Dacin, 1997), cause-related marketing (Varadarajan and Menon. 1988), and *enviropreneurial* marketing (Menon and Menon, 1997), have implicitly suggested that sustainability may in fact be a profitable strategy for firms. Recent research (Varadarajan, 2010) predicts that the "sustainability issue" will impact marketing discipline in a significant way.

Even beyond the customers, multiple stakeholders--comprising investors and government agencies--regard sustainability as an important and integral aspect of business success (e.g., Epstein and Roy, 2003; Pfeffer, 2010). In this changing context, market success is no longer ensured by merely delivering products and services of superior value, but doing so in a sustainable manner. Firms need to behave decently – look beyond profits to look after

the people and the planet as well (Elkington, 1998; Kinnear, Taylor, and Ahmed, 1974). This emerging worldview is changing the approach to brand management and suggests that brand equity is dependent on its performance on "the triple bottom line"–the "three Es" requiring that the brands be economically viable, ecologically sensitive, and socially equitable (Savitz and Weber, 2006).

Importantly, given that many brands target relatively younger generations, it is germane to ask if these initiatives "cut it" for those in the Millennial segment. According to the Forum for Innovation (2012), Millennials (those aged 18-32) have enormous direct purchasing power ranging between $125 billion to $890 billion according to different estimates. In addition, they wield an indirect influence on the Boomer segment (their parents) of up to $500 billion (Forum for Innovation, 2012). Companies can also gain sales by being the first in their respective categories to redesign existing products or develop new ones to be more sustainable. Green brands that are the first in a product are perceived in a more positive light, particularly by Millennials (Smith and Brower, 2012). Therefore, our objective is to understand the extent to which Millennials are aware of the social responsibility stance of various brands on the market. It should be understood, however, that while brand awareness does not guarantee positive brand equity, brand awareness is the first step toward garnering significant brand equity (Kapferer, 1997). In particular, we elicit the unaided awareness of various brands by Millennials and compare these to a list of brands and companies ranked according to their perceived level of sustainability practices.

In the next section, we proceed to present background on the state of corporate social responsibility (CSR) and sustainability, including various examples of evidence that companies present to promote their CSR stances. In addition, we paint a profile of the Millennial segment followed by a description of our methodology and results. Finally, we discuss the implications of the results as well as provide ideas for future research to overcome certain limitations of the study.

Corporate Social Responsibility Sustainability

Although the concept seems to be much in vogue these days, the idea of Corporate Social Responsibility has been around for decades. Some of the seminal articles stem from the marketing and strategy arenas, including two articles from the *Harvard Business Review*: Adler's article on "Symbiotic Marketing" (1966) and Austin's "Responsibility for Social Change" (1965). Not surprisingly, the subject of social responsibility took flight during the socially turbulent years of the late 1960's and early 1970's. Not only were academics concerned with understanding the social responsibility of companies (Bell, 1971; Grether, 1969; Lavidge, 1970; and Lazer, 1969), but they were also intrigued about the socially (or ecologically) conscious consumer (Anderson and Cunningham, 1972; Brooker, 1976; Kinnear, et al. 1974; Webster, 1975; Kotler and Zaltman, 1971). Indeed, Kinnear, et al. (1974) found that consumers who were ecologically concerned about pollution effects on the environment were likely to be an excellent segment to which to market specific products and services.

More recently, Sheth, Sethia, and Srinivas (2011) advance a customer-centric approach to CSR by examining corporate sustainability and specifically providing prescriptions for marketers. In particular, they suggest that marketers promote "mindful consumption" among consumers – one that tempers "acquisitive, repetitive, and aspirational" consumption. This approach suggests that marketers move from inviting customers to 'eat all you can' to a more optimal 'buy what you need' marketing stance.

Corporate sustainability endeavors

Top brands appear to embrace this new edict. Starbucks now proudly proclaims its use of post-recycled paper Kraft Foods, according to the sustainability report information provided on its website (Kraft Foods 2011) outlines a 36% increase in sustainable sourcing, a reduction in the use of packaging materials by five million pounds and an elimination of over 12 million travel miles in sourcing and distribution since 2010. Committed to marketing their products responsibly, Hershey does not advertise to children less than 12 years of age in the United States (Hershey Company 2011, p17). Also, Hershey pursues a zero-waste-to-landfill (ZWL) operation with three plants currently that meet this criterion. These plants recycle approximately 90 percent of the waste generated from operations and then convert the remainder to energy (Hershey Company 2011, p12).

Similarly, Amazon.com has adopted "frustration-free packaging" thereby eliminating use of plastic and deploying packaging materials that are 100% recyclable (Amazon.com, 2013). In keeping with its tagline –"food with integrity,"

Chipotle works selectively with ranchers whose pigs are raised in the open. These pigs are never treated with preventive antibiotics and are raised on a vegetarian diet. It similarly procures beef and chicken only from naturally raised sources (Chipotle.com, 2013).

Evidently, these measures imply brand investments of a higher order towards the sustainability goal. The implicit assumptions appear to be that customer preferences would be favorably influenced by these initiatives and that what is good for people and planet should be eventually good for the brand. Brands that score high on sustainability should do well on customer preferences (Kinnear and Taylor, 1973). Thus, brands seem to vie with each other in building a sustainability perception.

In this vein, *Newsweek* has been tracking green rankings globally. The rankings were computed by *Newsweek* in partnership with Trucost – a company that has been collecting and interpreting data to understand the economic consequences of natural capital dependency for over 12 years (trucost.com, 2013) and Sustainalytics – a global leader in sustainability research for over 20 years (sustainalytics.com 2013). According to Makower (2011) the *Newsweek Green score* is computed using three components:

- an environmental impact score (45% weight) developed by Trucost, using over 700 metrics to build a quantitative score of the overall environmental impact of a company's global presence;

- an environment
  al
  management
  score (45%
  weight)

- an environment
  al disclosure
  score (10%
  ~~weight)~~

We suggest that, being comprehensive and multi-faceted, the *Newsweek* Rankings provide an objective measure of sustainability. The top 500 (*Newsweek* 2011) globally green brands include 171companies / brands from the USA with IBM (2nd), Hewlett-Packard (15th), Sprint Nextel (16th), Baxter (16th), and Dell (25th) in the top five spots in the US. Microsoft (91st), Apple (117th), and Google (134th) can be found further down in the sustainability ranks. Although sustainability is the new buzzword that brands are obliged to pay heed to, it is important to verify if these initiatives necessarily augment overall brand equity. Owing to demand effects and social desirability most everyone is likely to agree that sustainability initiatives are appropriate. However, it is possible that in reality these initiatives may differ in their appeal among different segments.

The millennial segment

Recent surveys suggest that younger consumers, many in the millennial segment, are more concerned with Corporate Social

Responsibility than other age segments (Nielsen, 2012; Havas Worldwide, 2013). Evidence from the global Havas "Prosumer Report" (2013) found that ~50% of 18-34 year olds believe they "have more influence on society as a consumer than I do as a voter" (p. 11). This result was higher than the overall mainstream, as well as higher than those aged 35 and older.

Larger than the Baby Boomer Generation (Fromm, 2011), Millennials (or Generation Y) are Boomers' children and have been reared as optimistic, confident (Coates, 2007), and opinionated decision makers. Decisions regarding trends, style, and buying are of particular interest to Millennials (Waters, 2006; Uhland, 2007; Fromm, 2011). And if marketers hope to garner the voting dollars of this demographic spending giant, marketers must understand Millennials' perspectives on branding (Lodes and Buff, 2009).

As stated previously, the focus of the paper is to investigate the connections between the degree to which brands actively pursue corporate social responsibility via a sustainability agenda and whether or not these ranked CSR brands are known to Millennials. Importantly, we did not set out to ask specifically about CSR brands, but rather to find out which brands are most salient to those in the Millennial generation. Doing so would allow us to compare and determine the extent to which the top green brands in the *Newsweek* survey align with the most salient brands among the Millennial generation. We therefore hope to understand whether or not CSR brands are adequately promoting themselves so that a core constituent, such as those in Generation Y, are attuned to those brands. In summary, our

research question is: "Are spontaneously recalled brands by the 18-34 age group also recognized as socially responsible?

Millennials

The approach to understanding our focal question was to gather unaided brand recall data among Millennials in a classroom setting. One-hundred and ninety undergraduates from a large Midwest US public university participated in this study. Four participants did not indicate their birth year, and nine other participants were born prior to 1980 (variously considered not to be in the Millennial group). Setting aside these fourteen participants yielded a usable sample of one-hundred and seventy six participants (112 males (64%) and 64 Females (36%)).

Participants were asked to recall as many brand names as they could in five minutes in the order of recall. Participants could recall and record up to fifty-two brand names. The Brand Recall Index (BRI) for brand *j* was computed using Equation 1below (Krishnan, Sullivan, and Aurand, 2012):

$$1 \quad BRI_{BRANDj} = \left[\frac{100}{N}\right] \sum_{i=1}^{N}\left[\frac{1}{RANK_{ij}}\right]$$

Where, N= is the number of participants (N=176 in this study) in the sample and = the rank given for the *j*th brand by the *i*th participant.

Thus,

1. For every respondent, each brand was assigned a brand weight being the reciprocal of the rank order. For example a brand ranked tenth by a respondent would be evaluated at 1/10 = 0.1 for that respondent.

2. The brand weights were summed across all respondents. Should all the 176 respondents rank a brand at number one that brand would have a summed brand weight = 176.

3. Conversely if all the respondents ranked a brand the 52nd it would have a summed brand weight = (1/52)*176 = 3.39.

4. A brand with a summed brand weight of less than 3.39 would not be on the top 52 brand list for at least one participant.

5. Equation 1 computes *brand recall index* by summing brand weights for any given brand across the participant pool, normalized by the number of participants and scaled on a 100 point scale.

6. The brand recall index corresponding to the brand weight of 3.39 would be [3.39/176]*100 = 1.92

Results

In all, 1,402 brands were recalled at least once by at least one respondent. Interestingly, there was not a brand that was recalled by every member of the sample. One hundred forty (140) of 176 participants recalled *Nike*, 99 of 176 recalled *Coca-Cola,* and 39 of 176 recalled *HP*. Only nine participants (of 176) recalled *IBM*. The brand recall index varied from a low of .01 (*Lenovo*) to a high of 29.31 (*Nike*).

1. We purposely used the ranking from 2011 in order to maintain

The brands were rank-ordered based on the empirically derived BRI within the Millennial segment. Table 1 presents the comparative ranks from the *Newsweek Green Company* (2011)[1] rankings for the top ranked brands based on the BRI. The *Newsweek Green Company* rankings are by company name. However, the empirically derived brand names may include brand names that do not reflect the company name (e.g. Tide, P&G). Table 1 includes only the brands that form a part of the company name (e.g. Ford, Ford Motor Company).

Table 1
Brand Recall Index (BRI) Rank versus *Newsweek* Green Rank (2011)

Rank based on BRI	Newsweek Green Rank 2011	Company/ Brand
1	355	Nike
2	399	Coca-Cola
3	117	Apple
4	296	PepsiCo
5	217	Adidas
6	75	Sony
7	66	Ford Motor
8	91	Microsoft
11	401	McDonald's
15	368	Kraft Foods
18	25	Dell
20	118	Toyota
21	22	Samsung
23	124	Wal-Mart
24	159	Honda
26	15	Hewlett-Packard
26	439	Kellogg
29	37	BMW
29	134	Google
33	346	Target
39	26	Johnson & Johnson
43	419	General Mills
44	215	Gap
45	27	Toshiba
46	68	Walt Disney
52	65	LG

Interestingly, the top brands recalled by the millenials do not correlate well with the *Green* company/brand ranks from the *Newsweek* rankings. For instance, *IBM* is ranked #2 in the *Newsweek* rankings but ranks 100th in the brand recall study with a BRI of .71. In contrast, *Nike* ranks 1st in the present brand recall study but is ranked 355th in the *Newsweek* green rankings. Overall, the two ranks appear to be poorly related.

Conclusions, Implications, and Limitations of the Study

While nearly nine-in-ten (88%) of consumers feel a responsibility to purchase products they think are socially and environmentally responsible (Cone Communications, 2013) there is a lack of any obvious relationship between the *Newsweek* rankings and the Brand Recall Index rankings among Millennials. This suggests that companies may not be adequately promoting their corporate social responsibility and sustainability endeavors in spite of the fact that over 90% of global citizens want to hear about corporate social responsibility initiatives and progress (Cone Communications, 2013). Studies over time (Anderson and Cunningham, 1972; Havas Worldwide, 2013) have largely suggested that younger demographics tend to be more socially responsible than their older counterparts. Yet, in the current study, the millennial segment we focused on did not spontaneously recall even the most "green" companies in the *Newsweek* rankings. It is possible that this divergence may be owing to a general lack of awareness for many green brands that may not have crossed the Millennial segment in space and time. For instance, the U.S. Millennial segment may not be aware of many global brands. And, even among American brands, some of the top U.S. green brands in the *Newsweek*

ranking may lack awareness within the Millennial segment. For example, Baxter--a health care brand--may not have been encountered by a generally healthy Millennial segment.

Therefore, recognizing the perils stemming from null results, it seems plausible that many green companies are missing out on greater brand awareness in not actively promoting their CSR stance. While green products have inherent positive images to most consumers, not all firms have been able to effectively align their 'green' messages among Millenials. In essence, many companies are spending millions of dollars on green initiatives without getting credit for it. These companies are not gleaning sales from the environmentally conscious Millennial consumer perhaps because these companies are failing to effectively communicate to this segment that they are, in fact, "green" (Smith and Brower, 2012; Henrichs, 2008).

This is not to say that brands are losing among the millennial set. Instead, our conclusion is that companies may see better results if they augmented connections with the millennial set with an aligned promotion of their sustainability positions. Kotler and Zaltman (1971) proposed a way to market social endeavors, noting that the process is really no different than marketing other product or service offerings. Various advertising and public service campaigns, including the National Park Service's Smokey the Bear (Repanshek, 2010) and Keep America Beautiful's "Crying Indian" (Keep America Beautiful, 2013) seemed to tap this CSR understanding.

Decades ago, Kinnear and Taylor (1973) suggested that brands could indeed win in the marketplace by promoting their

ecological stance to socially concerned buyers; especially, if the promotion was in concert with other market changes, such as legislative and ethical requirements mandated by the marketplace. Our conclusion is that marketers should follow a programmatic and strategic process for relating the green/sustainable elements of their brands with the segment(s) they wish to target. Kotler, et al. (2010) provides such a process; however, it is not an easy process as it may transform the marketer from simply being "philanthropic" to that of effecting a "socio-cultural transformation."

For most companies, marketing this way will entail a more in-depth understanding of their consumers. Fortunately, "big data" and other customer relationship mechanisms can assist companies with uncovering this information and some research has shown that implementing these systems does have a positive return on investment (zdnet.com 2013). Even if implementation proves to be problematic, companies could rely on the Millennial demographic to be generally receptive to a CSR message (Nielsen, 2012). These messages could be delivered via the internet and social networking sites as prime channels where Millennials are more easily targeted and perhaps influenced. And given Gen Y's size and expected buying power, these consumers are not to be taken lightly by any company, especially those that have a lot to offer with regard to social responsibility.

Of course, we offer these ideas with the understanding that the current study has various limitations. Namely, that we did not directly measure nor ask participants to recall CSR brands. It is conceivable that we may have found a greater relationship to the subjective understanding of our millennial participants with that of the objective rankings from *Newsweek*. Nevertheless, we believe our study is potentially more discriminating in that spontaneous recall would be a stronger test of whether or not the marketing of brands that hold a CSR stance made it into the consideration set of the study participants. Perhaps a stronger test to understand this dynamic would be an ideal study to conduct in the future.

An inherent limitation of the study centers on the fact that some brands, green or not, simply do not resonate with Millennials due to the life experiences and interests of those within the segment. As consumers progress through their life cycles different brands come in and out of interests to individuals and market segments as a whole. This study was limited to those brands identified by Millennials and in turn brands identified in *Newsweek's Green Company* list without regard for Millennials' life cycle stage. Future research delineating brands of specific interest to Millennials would further enhance this study's findings.

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NEW AACSB STANDARDS ON THE
IMPACT OF RESEARCH:
IMPLEMENTATION AND MEASUREMENT ISSUES

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In 2013, the Association to Advance Collegiate Schools of Business (AACSB) adopted revised accreditation standards, which included a requirement that faculty intellectual contributions be evaluated for impact. This represents a switch from valuing the production of research to valuing its effect on society. The new emphasis on impact will challenge business schools to establish impact measures, revise promotion and tenure decisions, and re-visit strategic planning, staffing and funding decisions. This paper discusses the changes, possible school and faculty reactions to them, and issues and problems involved in implementation. The discussion should be useful to business school administrators, faculty, and the AACSB itself.

Keywords: AACSB, business accreditation, 2013 AACSB standards, impact of intellectual contributions, faculty research

Introduction

The Association to Advance Collegiate Schools of Business (AACSB) has a mission to "advance quality management education worldwide through accreditation" (AACSB, 2013a). Current members include about 1,350 institutions of higher education, of which 681 have an accredited business school. Although the majority of the members and accredited schools are U.S. institutions, the number of non-U.S. accredited schools is growing, including business schools from approximately 50 countries (AACSB, 2013b). The AACSB is recognized in the U.S. as the premier accrediting body for business education (White, Miles, & Lavernier, 2007).

Consequently, modification of the organization's accreditation standards is salient to business colleges holding or seeking accreditation.

In April 2013, the AACSB membership voted to adopt new standards, resulting in the most extensive changes since 2003 and potentially the most dramatic ever. These standards are designed to:

1. Encourage innovation in business schools.

2. Emphasize the impact of business education and research on society.

3. Demand significant engagement between students, faculty and the business world to stimulate innovation and provide impact (AACSB, 2013d).

Some of the most significant changes involve a requirement that business schools determine the impact of research in accordance with their mission statements. Previously it was sufficient to determine that adequate research was performed. Determining reasonable measurement metrics and encouraging faculty to perform research with likely impact will be difficult for U.S. business schools to implement. The new standards may alter guidelines for faculty reward systems and disrupt the research agendas of newer faculty members.

Ideally, business schools would wish to make changes to improve the usefulness of their faculty's intellectual contributions (ICs), rather than merely meet AACSB accreditation standards. Nevertheless, retaining accreditation is important to schools, which will be concerned about interpreting the standards and determining how to best meet them.

This paper will examine the previous standards governing research, show how they have evolved, suggest how schools may react, and list issues and problems that may accompany their implementation. We hope that this discussion will be useful to school administrators and faculty who will be working to meet these new standards. The paper should also benefit faculty on promotion and tenure committees who will perhaps try to use such mechanisms to encourage faculty to perform research that is likely to have positive and measurable impact. Also the AACSB itself may find the discussion valuable in determining whether to offer additional guidance dealing with the issues we mention.

Background

In 2006, the AACSB established the Impact of Research Task Force to "increase the overall value and visibility of business school research" (AACSB, 2008, p.7). The Task Force concluded that although research was an important function for business schools, too much attention was being paid to basic research and counting articles published by faculty members at the expense of contributions to pedagogy and practice (AACSB, 2008). Also, the impact of faculty research activities should be considered in developing business school strategic plans and evaluating success. As a follow-up to the task force's recommendations, the AACSB sponsored an exploratory study of ten business schools attempting to assess research input. The resulting report (AACSB, 2012b) provided some limited examples and insights, which were reproduced in the 2013 standards.

The recent implementation of Assessment of Learning (AoL) by the AACSB can provide foresight into what might happen with the movement toward impact measurement in research. The decision by the AACSB to endorse assessment through its standards was not well received initially. Most business school administrators and faculty were unfamiliar with the concept of assessment. Early attempts at assessment centered on indirect measures, lacked follow up by faculty on accumulated results, and generally were not taken seriously. Over time, the AACSB, through improved communications and enforcement in the accreditation process, was able to gain acceptance by and improve assessment at its accredited schools. Improved communication between the AACSB and member schools and among such schools should speed up the process regarding the impact of research.

However, the AACSB seems reluctant to provide much guidance on impact. Robert Reed, executive director and chief accreditation officer for the AACSB, has indicated that additional formal guidance regarding impact will be muted for the first two years of the new standards (Reed, 2013). Instead the AACSB leadership prefers that schools develop metrics and implement the needed changes on their own. Reed also indicated that this hands-off approach may avoid what some consider being a major problem with the implementation of AoL. That is that current practices are not diverse enough among schools to match with the variety of mission statements.

Previous Standards

Under the previous standards, a business school's mission statement was supposed to guide the types of ICs produced to assure consistency with the school's goals. These could be stated in terms of content or audience. For example, a school might state "faculty will perform basic scholarly research that contributes original knowledge and theory in management disciplines" or "the faculty's scholarship will provide advances in practice to both business professionals and educators."

The expected targets or outcomes of the activity were to be determined by the school. A number of examples of outcomes were listed in the previous standards. Peer reviewed journal articles, textbooks, proceedings, book reviews, etc., were traditional outlets. Also included were items such as non-peer reviewed journal articles which the school could support for quality. The production of the item itself was an outcome for accreditation purposes. In

previous standards, intellectual contributions were essential for the business school to:

1. Contribute to the advancement of management theory, practice and/or learning pedagogy.

2. Ensure intellectual vibrancy across and among faculty members contributing to the currency and relevancy of management education programs.

3. Ensure that the business school contributes and is an integral part of an academic community of scholars across all disciplines within an institution and in a larger context (AACSB, 2012, p. 21).

New Standards

The portion of the 2013 standards printed below illustrates the change in emphasis. "*Scholarship that fosters innovation and directly impacts the theory, practice and teaching of business and management is a cornerstone of a quality business school. A broad range of scholarly activities ensures intellectual vibrancy across and among faculty members and students; such activities contribute to the currency and relevance of the school's educational programs and directly foster innovation in business enterprises and academic institutions. Intellectual contributions that arise from these scholarly activities ensure that the business school contributes and is an integral part of an academic community of scholars within an institution and across the broader academic community of institutions in higher education. Outcomes of intellectual contributions are indicated by their impact on the theory, practice and teaching of business and management,*

rather than just by the number of articles published or documents produced" (AACSB, 2013c, p.13).

While these two sets of statements are very similar, important differences can be seen. The 2013 standards use the word "innovation" twice; the previous standards do not use the word at all. The emphasis on new approaches, as opposed to incremental or minor changes in old approaches, is significant. Secondly, the word "directly" is also used twice. Directly impacting theory, practice and teaching and directly fostering innovation would appear to require markedly different and considerably more proof (documentation) than indirect effects. Finally, and most importantly, the impact of intellectual contributions is now taken into account. Previously, it was sufficient that intellectual contributions were performed.

Possible Reactions

How will business schools react to the new standards regarding intellectual contributions? At a minimum the following steps seem necessary:

1. Faculty and stakeholder discussions and reflection are needed on the role of ICs in fulfilling the mission of the schools.

2. Modification of the mission, expected outcomes and strategic plans will be needed to accommodate any consensus reached in step 1.

3. Development of metrics will be needed to measure the impact of the ICs produced by faculty.

4. The faculty reward systems will need revamping to reflect the results of steps 1, 2 and 3.

Steps 1 and 2 above are probably interactive rather than strictly sequential. Regularly reviewing and updating a school's mission and strategic plan are time tested principles of management. The mission may be revised as a result of other aspects of the new standards (such as a focus on innovation in education and interaction with professionals) and ICs may be adjusted to deal with these changes. However, the new standards also require that schools consider the impact of research in their programs. The effects of such examination may result in a need to retool the mission statement. The standards indicate that financial resources should be committed to facilitate a school's mission. Changes in missions as determined above may require additional resources, some of which may be allocated to encouraging appropriate ICs.

A critical step in the reaction to the new standards involves the measurement of impact. Tools for measuring impact are not well developed in management education and will require some "thinking outside of the box." Since each school will define impact based on its mission, cookie cutter metrics will not be feasible. Benchmarking with peer institutions may also be a challenge because of the uniqueness of the mission statements.

Incentives must exist to lead faculty efforts in the right direction since the AACSB has indicated that only those intellectual contributions that have impact in achieving the school's mission will be counted. Even though impact will be measured at the school level, the IC portfolio

of the business college is the accumulation of the outputs of individual faculty members.

Issues Resulting From the "Impact" Directive of the New Standards

These new rules have certain positive implications. The tying of research impact to the mission emphasizes the role of research and should increase the chance of research benefitting the institution, business, and society. As a practical matter, this should enable the AACSB to claim that its research requirements (and indirectly, its academic qualification requirements that require a large percentage of the faculty to have a research-oriented terminal degree) are meaningful and not simply "hoops to jump through." The AACSB has provided some broad direction and appears willing to allow schools flexibility in meeting the standards, recognizing that each school has a unique mission statement.

The 2008 AACSB report acknowledged that its impact recommendation was very controversial and that, although there was general agreement about the logic behind it, many believed that implementation would be "difficult or impossible." However, awareness of potential problems should reduce practical implementation difficulties and enhance the likelihood of schools' enhancing the impact of their faculty's research. A number of issues and possible problems with the impact standard are discussed below:

1. Using objective criteria, such as number of journal articles, has been useful in hiring and directing faculty who like knowing what is expected of them. The new standards reject that approach in favor of a much more subjective one.

2. Shifting the accepted philosophy on research value will not only be difficult within the business school, but necessary and more problematic at the university level. At most institutions tenure and promotion guidelines, strategic plans, research funding, etc. are reviewed outside of specific colleges. Normally support from the provost is required for a major change in a college's approach to research. The administration of new policies is often overseen by university level committees. These individuals will need to be convinced that the new view of research has value. In a unionized environment, objective measures are considered preferable, to avoid favoritism or discrimination. Modification of reward systems to include more subjective measures will be problematic in such an environment.

3. A substantial cross-section of faculty in each discipline must produce intellectual contributions. However, since individual qualifications are dealt with separately from the impact of research in AACSB standards, faculty may retain their academic qualifications for accreditation purposes even if their scholarly activities do not coincide with the mission statement. This reduces a school's ability to influence faculty research through promotion and tenure decisions. Creating effective incentives for faculty to produce research with impact was cited as a major issue in the 2012 AACSB study. Suggested incentives included awarding release time and providing grants to those faculty members who can demonstrate a likely positive impact consistent with the school's mission. Such incentives are quite costly, however, and may be of limited applicability to cash-strapped schools.

4. Some faculty perform research in areas that are necessary for that individual to remain current in his or her field, but such research may not be a priority of the school and therefore not tied to its mission statement. This can lead to morale problems if research incentives that a school provides are not available to all.

5. The exploratory study report (AACSB, 2012b) suggests that faculty research may need to be monitored and tracked on an individual basis to ensure that the mission is met. This includes the research product, audience, and impact of individual faculty members' research agendas and portfolio. If this is done by administrators, considerable academic freedom issues may arise, as well as administrative difficulties. The report also suggests that metrics will vary among faculty members and will change as the career cycle of an individual professor evolves.

6. Knowledge transfer is important for impact. Publications read by practitioners may result in more widespread impact, but may not have the academic rigor required to be considered top-quality research (AACSB, 2008). Some researchers might be reluctant to engage in such research because of concerns about how it would affect their reputation as researchers and their mobility in the profession.

7. Much research currently is incremental, as a research article builds on the research of others. This enables a researcher to expand on an existing body of knowledge and feel secure that the topic is one of interest to the profession. Truly innovative research that might make a big impact might just as well fail because it is too "out there" to be published. Such

research might also be more time-consuming. This is a risk for faculty, particularly those with the tenure clock running.

8. The new standards discuss a school's need to measure the impact that the research "has had," which implies that the impact has already occurred. However, on page 16, the standards indicate that the school must maintain "a current portfolio of high quality intellectual contributions that could impact theory, practice, and/or teaching in the future." This is unclear. Is the portfolio for current or future evaluation purposes or both? The AACSB's indication that schools may go back further than the traditional five years in recognizing research because it has finally been shown to have had an impact provides support for the view that the AACSB favors demonstrated impact rather than expected impact. The AACSB's chief accreditation officer indicated that it might take 20 years or so for impact to be determined (Bissou, 2013).

9. Additional complexities arise from the above provisions in the standards that allow evidence of impact generated by ICs produced before the beginning of the five year evaluation period for initial accreditation and reaffirmation. The extension of the review period raises several questions:

A. How are ICs of faculty whose activities precede the five year period and have left the institution evaluated?

B. How are the ICs of faculty hired during the evaluation period with ICs produced before the hire date that are now having an impact evaluated?

C. How are pre-evaluation period ICs treated when judging the individual faculty member's efforts to maintain faculty status, i.e. Scholarly Academic, Practice Academic, etc? Under the new Standard 15, schools must maintain and assign an appropriate mix of faculty from four groups based on the proper credential at the time of hire and maintained by participating in certain professional activities. Two of the four groups (Scholarly Academic and Scholarly Practitioner) maintain status partially through the production of ICs. Faculty in another group (Practice Academic) are encouraged to produce ICs.

10. Studies of the impact of research at different times or across different time periods may result in considerably different results (Group of 8, 2011). If research is evaluated only once for impact, when is the appropriate time to do so? The new standards are unclear on this matter.

11. A key concern with impact is that its worth is dependent on parties outside of the business school (Group of 8, 2011). For example, if financial market research indicates the need for greater regulation of securities markets, but this does not occur for political reasons, it could be argued that the work lacked impact.

12. Another major issue is the considerable difficulty involved in determining the impact of particular research that is part of a stream of research in a topic performed by investigators from different institutions. A further difficulty involves

determining how much of the impact was due to research versus other parties' work in carrying research results forward into innovative action (Group of 8, 2011). The relationship among research, knowledge transfer, application, and various economic or social outcomes is very complex. It is very difficult to determine the impact of one of many factors that influence personal or corporate behavior.

13. The focus on research impact may reduce the likelihood of some research being performed (Group of 8, 2011) for several reasons. First, faculty may focus on items that appear to have more objective measures. Also, less research may be performed in "smaller markets." For example, research affecting the teaching of international accounting might be viewed as having less potential impact and value than research in accounting principles, because of the greater number of courses and students which could be affected by research in the latter field. Finally, researchers looking for impact might focus on the quick hit rather than the long-term impact (Guess, 2012). The most frequent concern is that theoretical work may be downplayed. An example of a measure of intellectual contribution impact listed in the Appendix to the new standards is "textbooks widely adopted." If a writer spends an enormous amount of time preparing a textbook and it does not sell well, then under the new rules it doesn't count.

14. Casework and classroom innovations would appear to be favored by the new standards. Cases would be readily available to be used in a number of professors' classes and their use might be monitored. Classroom innovations are generally used in the researchers' own

classes before being publicly distributed, so the impact is already known to a limited extent.

15. The 2012 study report emphasized the importance of the school's being authentic in its selection of missions. Schools may have to abandon the use of trendy mission statements, such as those stressing "global innovation," if they are not prepared to have business faculty perform significant research in this area. On the other hand, if such an area is considered important to the mission, a school must find ways to enhance faculty members' interest and knowledge in such areas.

16. As noted in the 2012 AACSB study, the use of more subjective measures may lead to impact being reported in a subjective way that favors the school. This would appear to create difficulties for review teams in determining the appropriateness of impact statements by accredited schools.

17. Even some of the more "objective" measures mentioned in the standards may be manipulated. One mentioned measure of impact is the number of downloads of online journals. If the access to the journal is free, researchers could manipulate the results by repeatedly downloading their own work.

Conclusions

The new standards illustrate the AACSB's commitment to continuous improvement. Nevertheless, gaining acceptance, implementing and evaluating their effectiveness will be challenges for the AACSB. The current wording of the standards lacks clarity; this creates difficulty for accredited schools, those schools seeking accreditation, and those who will serve on review teams to determine schools'

adherence to standards. The AACSB might consider providing additional guidance and also addressing possible unintended side-effects of its standards, as noted in the section of this paper on issues and problems.

Not all of the issues we discuss will apply to each AACSB-accredited school. As schools begin implementing changes to meet the standards, they may encounter other challenges we did not note in the paper. Nevertheless, this paper should provide AACSB accredited schools and those seeking accreditation with topics to consider when developing research policies and impact metrics, while trying to avoid pitfalls that we have noted. Although the AACSB may initially focus on good faith efforts and may be willing to accept considerably less than ideal responses to the new standards, addressing the issues in the paper may lead to more effective and efficient means of meeting these standards and improving schools' intellectual contributions. While there will be a variety of possible impact metrics, it will be the school's responsibility to justify their appropriateness.

Serious discussions by business school faculty and administrators will be required to deal with the role of research in accomplishing a school's mission and how the impact of such research will be measured. Reward systems will need to be adjusted to encourage faculty to produce desired intellectual contributions. Whenever allocation of limited resources is considered in academia, disputes and hard feelings may result. Issues of academic freedom and accommodating individual faculty interests may run counter to the business school's need to enhance the likelihood of meeting AACSB requirements. The issues and problems discussed in this paper may help identify likely areas of concern and help structure the debate within business schools.

This is important because of the relatively short time period (2013-2016) for implementation. During this time schools are expected to work establishing metrics, documenting impact and adjusting faculty assignments to comply with the standards. The AACSB will need to monitor the progress of business colleges being reviewed and others adjusting to the new rules. Schools scheduled for peer review team visits before the 2016-2017 academic year may choose to be evaluated under either the old or new rules. Early adopters will benefit from consideration of the issues raised in this paper as well as providing guidance for later adopters.

Ultimately these changes may prove quite valuable to AACSB accredited institutions. Progressive business colleges will view this as an opportunity to reconsider the school's mission and perhaps change direction. The emphasis on faculty research contributing to a school's mission should improve cooperation and cohesiveness among faculty members. Fewer schools may insist on limiting faculty research to basic research in a small number of elite journals. Research designed to improve practice or pedagogy may become more valued. Communicating clearly defined measures that are understandable outside of academia should increase public awareness of the contributions to society made by business schools and thus provide marketing opportunities for internal and external resources and aid in the recruitment of students. The perceived quality of the school's AACSB accreditation may also be enhanced.

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SOCIAL NETWORKING: THE IMPACT OF STATUS IDENTITY

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Online social networks are without borders. Their users come from diverse and varying cultural backgrounds. This study investigates the influence that power distance can have on the sharing of information on social networking sites. Research findings support the proposal that high power distance countries and low power distance countries do differ in information sharing practices. The magnitude of the difference depends upon the type of information sharing, specifically personal, social, or professional. Within each information type, there is also some variation among the subset of items.

Introduction

Social networking sites (SNS) have become one of the most popular mediums to share different types of information in the global arena (Strater and Richter 2007). It has become a common way to meet new people, to stay connected to family and friends, and to stay up to date on the world's current events (Boyd and Ellison 2008). People share different types of information which include personal, social, and professional information (Narayanaswamy and McGrath 2011, Narayanaswamy and McGrath 2012, Vasalou et al. 2010). The success of SNS depends on how well people use them for information sharing (Boyd and Ellison 2008, Vasalou et al. 2010). Accordingly, it is important to understand the factors influencing an individual's motivation to share information on SNS.

Prior research notes that selection of SNS is affected by several factors such as privacy settings, SNS design/features, gender, social pressures, and site popularity (Boyd and Ellison 2008, Grant 2005, Narayanaswamy and McGrath 2012, Vasalou et al. 2010). More interestingly, a person's motivation to use a particular social networking site is rooted in his or her personal experience (Vasalou et al. 2010). In particular, it has been noted that social experiences influence a user's preference of a site and, more specifically, what kind of information they choose to share. Distant but related literature reveals that personal and social experiences are formed based on the cultural values held by individuals (Hofstede 1980, Hofstede 1991). Previous studies have observed that cultural values influence an individual's response to information exchange requests (Chow et al. 1999).

For instance, it is considered rude or impolite to ask direct questions in the Chinese culture; yet this type of activity might be normal in Western cultures. Therefore, how cultural values affect an individual's intention to share information, including its type and depth needs to be considered within a SNS context.

One of the most cited frameworks to understand behavior of people across the national cultures was proposed by Hofstede et. al. (2010). This study considers one of the most popular cultural dimensions - power distance (Schermerhorn and Bond 1997, Sully de Luque and Sommer 2000) and examines its impact on individuals' information sharing behavior in the context of SNS. Power distance exemplifies the extent to which power is distributed across members of a culture (DeVos and Suarez-Orozco 1990). Prior research has noted that an individual's information sharing is influenced by their social ranking in the society (Khatri 2009). For example, in a society high on power distance if a lower ranking member posts a witty comment about a higher ranking member, it is considered a threat to the social order and therefore will be strongly condemned which is unlike what occurs in a society low on power distance (Bond et al. 1985). Similarly, it has been observed that people in low power distance countries share more information and communicate more freely when compared to those in high power distance countries (Khatri 2009). This study extends these views and examines how power distance influences an individual's information sharing behavior in an online social networking context.

Online social networking is without borders; users emerge from diverse and varying cultural backgrounds. The findings from this study can provide insights for SNS to develop strategies that suit the user's cultural values in order to promote information sharing. For instance app developers understand user's cultural identity and accordingly enrich the apps with features to better serve their customers' needs. From a user standpoint, this study can help users understand the importance of cultural values and thus help them make informed decisions regarding the types/kind of information to share while interacting with the global community.

Related Literature

Prior studies have noted that cultural differences impact individual preferences and behavior (Hofstede 1980, Hofstede 1991). Hofstede (1980, p.5) describes culture as "a collective programming of mind which distinguishes the members from one group or category of people from another." Hofstede identified five cultural dimensions: individualism versus collectivism, high versus low power distance, masculinity versus femininity, strong versus weak uncertainty avoidance, and long-term versus short-term orientation. The long-term versus short-term orientation dimension is also known as Confucian dynamism based on a survey of Chinese culture (Hofstede and Bond 1988). While all the cultural dimensions are important there has been emphasis on some more than others. For instance, the individualism and collectivism dimension has received the widest attention among researchers followed by power distance (Earley and Gibson 1998).

Hofstede adopted the term power distance based on the research done by a Dutch experimental social psychologist Mauk Mulder, who conducted numerous laboratory and field experiments with simple social structures (Hofstede 1984). The experiments examined the emotional distance that frames relationships between individuals. Power distance was defined as degree of inequality in power between a less powerful individual and a more powerful other, in which the individual and the other belong to the same social system. Hofstede extended this notion of power distance from a dyadic, social-psychological concept to a broader, cultural concept by defining power distance as the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally (Hofstede et al. 2010).

Previous studies have examined cultural values in various contexts. For instance, it has been noted that cultural values influence an individual's intention to accept and use technology (Venkatesh et al. 2012). Within SNS research cultural values have been found to impact an individual's motives to join SNS, choice of privacy controls preferences, and commitment to belong to a particular SNS group (Joinson 2008, Vasalou et al. 2010, Fogg and Iizawa 2008). In particular, some studies have shown that power distance impacts an individual's communication behavior (Khatri 2009, Sully de Luque and Sommer 2000). The information sharing literature reveals that individual information sharing behavior is influenced by various contingencies such as emotional distance and personality traits

(Constant et al. 1994). In particular, it has been noted that attitudes about information sharing depend on the form or type of information. Individual attitudes are formed based on their cultural values (Hofstede 1991). It was observed that individuals in high power distance countries are hesitant to share openly sensitive information because they are respectful to the elderly members of the society (Frenandez 1997). For example, high power distance countries like China intend not to divulge information in openly sharing informal information venues as compared to western countries which are generally low on power distance (Chow et al. 1999). This study extends these perspectives to examine the impact of power distance on individual information sharing behavior in SNS. More specifically, it is proposed that sharing of personal, social, and professional information differs between high and low power distance countries.

Method

The data collection was done in an iterative, systematic manner. Basically, it required finding enough viable countries with high power distance index (PDI) and enough with low power distance index (PDI) and finding SNS with equal representation of users from the identified countries who were sharing personal, social, and professional information. First a list of the top SNS based on various criteria such as the number of users, language (English-speaking), country of origin, and popularity was identified for final investigation. The identified SNS were verified with prior research (Bonneau and Preibusch 2009) and through reports in other outlets such as Alexa, a web traffic monitoring company. The final list consisted of 50 SNS.

Simultaneously, identification of countries to be included was begun using power distance index (PDI) scores published in Hofstede et. al. (2010). The goal was to include enough countries to represent the entire spectrum of power distance. To achieve this, the process was started with the country with highest PDI and the one with the lowest PDI score. Then, each site in the initial list of fifty SNS sites was thoroughly screened for availability of personal, social and professional information (Narayanaswamy and McGrath 2014) from users originating from low and high power distance countries. Initial screening revealed the presence of certain barriers which prohibited users to exchange freely information on SNS. For instance, Malaysia and Slovakia each have a PDI score of 104, but it was not possible to include sites from these origins due to language and political barriers. Similarly, Israel has a PDI score of 13, but information sharing was restricted due to the political environment. Thus, countries with next highest/lowest PDI score were examined for information availability. As soon as three countries at the high end of PDI scores and three countries at the low end of the PDI scores were identified as viable, the process was stopped.

Another issue associated with data collection was the availability of a diverse population on the SNS. Each identified SNS was scanned for user diversity, that is, a significant number of users needed to be participating in information exchange from various PDI countries. For instance, in sites like Orkut the users were skewed towards a particular origin; in this case it was India. To maintain consistency in user diversity only sites which had equal representation were considered. At the end of this process for user diversity, only two SNS remained for data gathering, namely MySpace and Facebook. These sites have been consistently ranked as prominent players in the social networking domain.

At the end of the iterative process three countries representing each "high" and each "low" were chosen. Low power distance countries included – New Zealand (PDI score: 22), Great Britain (PDI score: 35), United States (PDI score: 40) and high power distance countries included – Mexico (PDI score: 81), India (PDI score: 77), Brazil (PDI score: 69). Data was then collected from the two SNS – Facebook and MySpace. Fifteen observations from each country were recorded leading to a total of ninety observations. For personal information twelve different pieces of information were collected; social and professional information had ten and nine different pieces of information respectively. This resulted in 2,790 data points. The approach used in this study is consistent with prior research (Vasalou et al. 2010). And lastly, because each type of information was reflected in different data pieces – personal (12), social (10) and professional (9), a t-test was not performed. In the social networking environment each data piece carries different weightage (Coyle and Vaughn, 2008). For example, as noted under personal information, while many users indicated their relationship status, not many listed the type of relationship. If all the data pieces had been combined, it would not have been possible to explicate the subtle variation with each data type. The t-test would have covered these subtle variations.

Study Limitations

As with other academic studies that use secondary data, there are limitations in this study. Due to availability constraints the analysis was done using information which was publicly shared by Facebook users, and

thus the findings may not be applicable to the larger population. The study needs to be extended to a larger sample to include other types of information which may not be publicly available. Inasmuch, future studies can try to access the user's private information and determine any potential influence of power distance on it. Also it must be noted that, while the results showed that power distance influenced the types of information that a user shared, there may be other items such as gender and level of technological expertise that can affect information sharing behavior. It may be worthwhile to consider these factors. Finally, this study explored only one of the five cultural dimensions proposed by Hofstede. Power distance was chosen because of its unique non-replicating behavior, that is, prior studies have observed that the power distance dimension was more robust and displayed more varying results when replicated over multiple time periods (Hofstede et al., 2010). It would be interesting for future research to explore each of the other four dimensions to determine its influence on online information sharing behavior. The PDI score used in this study was adopted from Hofstede (2010) survey results. As mentioned in the method section, the number of countries included in the study was narrowed down based on the availability of desired information and user representation. It would be interesting to include all the countries in the power distance continuum and examine the relationship between power distance and information sharing behavior. But, this is not to say that smaller studies do not yield fruitful results. As noted by Hofstede et. al. (2010), studies comparing two or three countries did statistically confirm the impact

of all cultural dimensions. So despite any shortcomings, this study revealed some interesting results which can serve as a foundation for future research to expand the study of information sharing behavior in SNS.

Findings and Discussions

The main objective of this study was to examine if there is an association or connection between the cultural dimension of power distance and individual information sharing behavior in SNS. It was expected that there would be difference in the type of information shared by the users from high and low power distance countries. In particular the extent to which users share different types of information –personal, social and professional information on SNS was observed. The data was examined using frequency analysis.

Power Distance and Personal Information

Personal information refers to information individuals share to create an identity in the social networking environment. This information is primarily used to establish connections with other users in the SNS. Moreover, it is used to evaluate personality traits (Bonneau and Preibusch 2009) and to design custom online advertisements (Grant 2005). Inasmuch, personal information influences the user's identity in the online environment which determines how individuals communicate and interact with each other in the social networking environment. Twelve different pieces of personal information were examined. The results of the frequency analysis are displayed in Table 1.

Table 1
Power Distance and Personal Information Sharing Percentages

Personal Information	Power Distance	
	High	Low
Relationship Status Indicated	40%	51%
Relationship Status Named	2%	13%
Age	44%	54%
Zodiac Signs	16%	27%
Shared Photos	69%	60%
Shared Friends Photos	51%	40%
Shared Party Photos	20%	27%
Graduating Year	54%	66%
Political Views Indicated	2%	4%
Religious Views Indicated	18%	32%
Picture or Profile NOT available for public view	27%	26%
Indicating Personal Lifestyle Choices: tobacco use, drinking and other preferences	31%	29%

The numbers in Table 1 indicate some noteworthy difference in information sharing patterns for certain pieces of personal information such as describing relationship status, zodiac signs, and expressing religious views. This finding is consistent with the cultural research which reveals that in low power distance countries the emotional distance is relatively small; the dependence between people in a lower-class group and a higher-class group is low (Brett and Okumura 1998). Namely, lower-class or higher-class implies their hierarchical standing in the society e.g., parent (higher-class) - child (lower-class), subordinate (lower-class) – leader (higher-class).

In low power distance countries, behavior towards others is not dependent on the other's age or status; formal respect and deference are seldom shown. Individuals irrespective of their group status are allowed to make their own choice without the fear

being suppressed by other members. On the contrary, in high power distance countries, the emotional distance is high; the dependence relationship is prominent. People in lower-class groups are expected to be obedient and adhere to the values set-forth by the members of higher-class group (Hofstede et al. 2010). In these societies, people in lower-class group tend to be very careful about what they reveal because giving wrong clues can result in dire consequences. Similarly people in higher-class groups tend to be very cautious in what they reveal about themselves because any wrong indications can damage their status in the society. The category of shared photos by friends is an anomaly with more high power distance users dominating. Slightly over one-fourth of high and low power distance users are similar in not sharing their picture or profile for public view.   In summary, power distance does seem to influence the extent to which individuals share personal information.

Power Distance and Social Information

Social information refers to data that helps the individual to develop social relations with similar groups or people. This includes photos of a personal event, group affiliations, music genre and tags on preferred videos. The main intent is to become an integral part of the desired social group or to attract other users to be a part of the user's own community. Ten different pieces of information were considered for frequency analysis. The results are shown in Table 2.

Overall, users from both high and low power distance countries shared a substantial amount of social information. The numbers were particularly high for certain aspects such as favorite activities, music genre, and music artist. This finding reflects the seismic shift in growth of using online media as a medium for entertainment (Evans 2013). More interestingly, in some instances such as indicating books and favorite teams, users from high power distance shared more information than those from low power distance countries. Among the three high power countries, users from India shared the most amount of social information than compared to Mexico and Brazil. This is consistent with the cultural research which notes that people in high power distance countries such as India often procure popular brand items in order to attract or appeal to the higher-class groups in the society (Pookulangara and Koesler 2011). Another interesting finding is that power distance did not have much influence on SNS users with respect to sharing specific religious or political affiliations. While there was some inclination from the users in high power distance, it was not very significant.

Table 2
Power Distance and Social Information Sharing Percentages

Social Information	Power Distance	
	High	Low
Photos Shared: Family Functions	29%	22%
Hobbies: Books Indicated	31%	11%
Music Genre Indicated	51%	60%
Music Artist Indicated	61%	64%
Favorite Teams/Sports Indicated	27%	21%
Movie/TV Shows Indicated	44%	51%
Favorite Activities/Interests Indicated	73%	71%
Group Affiliations Specifically Named	4%	7%
Political Group Associations	2%	--
Religious group affiliations	--	--

This indicates that cultural factors' influences may not supersede other risk factors such as being outlawed or targeted while sharing certain types of information. A similar instance was noted in prior research which observed that in high power countries subordinates seldom or never contended their superior's decision even when they knew it was wrong or would lead to dire consequences (Khatri 2009, Schermerhorn and Bond 1997, Madlock 2012). Thus, in general sharing of social information seems to be relatively popular regardless of power distance.

Power Distance and Professional Information

Professional information relates to the data about one's expertise, credentials, and experience. This includes information such as degrees, educational levels, certificates, and place of employment. The main purpose of sharing this information is to establish credibility and reputation in the online environment. Nine different pieces of information were considered for analysis. The results are shown in Table 3.

The results indicate that power distance has an explicit influence on professional information sharing that approximates the influence it has on personal information sharing. There is greater variation in the magnitude of information shared between the users from high and low power distance countries for both of these information sharing types as compared to social information sharing.

In Table 3, overall results indicate that users from high power distance countries shared more professional information than those from low power distance countries. This is consistent with prior cultural research which notes that in high power distance societies, the teacher-student relationship is treated with great respect. Teachers are treated as *gurus* who transfer personal wisdom (Hofstede et al. 2010). Thus, achieving higher levels of education is seen as a great accomplishment in the society. Again as noted with social information, users from India shared more professional information than those from Mexico and Brazil.

Table 3
Power Distance and Professional Information Sharing Percentages

Professional Information	Power Distance	
	High	Low
Place of Employment Indicated	31%	16%
Occupation Specifically Named	26%	18%
Degrees Held	9%	4%
Professional Certificates Listed	17%	7%
School Awards Indicated	12%	0%
Professional Chapters or Networks Named	33%	44%
Major or Program of Study Indicated	13%	16%
Major or Program of Study Specifically	11%	15%
Languages Spoken	13%	9%

This may be due to the fact that educational levels in India are higher and a larger percentage are professionally qualified (UNESCO 2011). More interestingly, this finding implies that individuals in high power distance countries use professional information as a means to enhance their status in the society.

Another interesting finding was that a larger percentage of users from low power distance countries indicated their association with professional chapters/networks. This may be because countries like Great Britain and the United States have a larger number of professional chapters than countries like Mexico and Brazil (Meeting Professionals International 2012). Also the user distribution on professional sites like LinkedIn shows a greater number of its users are mainly from the United States and the United Kingdom (Nishar 2013). From a cultural standpoint, low power distance societies encourage equal rights (Hofstede et al. 2010), that is, people have the same privileges irrespective of their professional standing which might explain the greater participation from low power distance countries. In summary, power distance seems to have a greater influence on personal and professional information than on social information.

Conclusion

Findings confirm that there is an association between power distance and information sharing behavior on social networking sites. In general, the type of information shared, namely, personal, social, or professional, differs between high power distance countries and low power distance countries. The overall magnitude of

difference is greatest and almost equal for personal and professional information sharing by users. Interestingly, social information sharing is popular regardless of power distance. Users can benefit from these findings because it helps them to understand the impact of sharing the various types of information across cultures that may be different from theirs and to decide what information they wish to share globally. By understanding various cultural values, SNS can better develop strategies to encourage and augment information sharing by users. For companies, online profiling of users may be different and somewhat difficult because of the different information sharing patterns that are affected by power distance. Thus, overall this study reveals information sharing practices that make a valuable contribution to the social networking literature.

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