Intellectual Human Capital Dependence, Family-Friendly Firms, and the Advancement of Women

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In the past two decades demand for educated workers has increased wages for skilled labor and induced more educated women to join the work force. Yet women are still more likely than men to voluntarily reduce workforce participation to attend to family responsibilities. Replacing them can be difficult and costly. We find that firms that are highly dependent on intellectual human capital are more likely than others to appear on "Best Companies" lists and to have female top executives. Firms on these lists often offer a family-friendly culture and benefits, which help their skilled working parents balance their responsibilities.

INTRODUCTION

During the past two decades, considerable efforts have been made to link human resources management strategies with organizational performance. While positive linkages have been identified, Youndt and Snell (2004) argue that too little research has focused on how this process works. In response to this shortcoming they offered up a model of intellectual capital as a mediating variable in the relationship between the two. Although authors have conceptualized intellectual capital in multiple ways (Bontis, 1998; Edvinsson & Malone, 1997; Stewart, 1997), a synthesis of the frameworks defines it as a compilation of three distinct knowledge structures - human, organizational, and social – each residing at a unique level – within the individual, the organization, or embedded within relationships (Youndt & Snell, 2004). Hence, intellectual human capital (IHC) refers to the knowledge, skills, experience, and expertise that resides within individual employees and is therefore very difficult to replicate.

Within the U.S., the growth of the jobs requiring specialized knowledge instead of physical labor has become an accepted trend. Driving this trend are many factors: increased globalization, increased technology, and the shift to a service-based economy. Unlike in the past when fixed assets drove productivity, the accumulation and effective utilization of an intangible asset – intellectual capital – has become paramount. Organizations now depend heavily on the abilities, innovations, and knowledge of their workforce. Acknowledging this reality, SAS CEO Jim Goodnight states, "My chief assets drive out the gate every day. My job is to make sure they come back[1]." Given that SAS was named the top

employer in Fortune's 2010 list of Best Companies to Work For, is highly profitable, is the largest privately owned software company in the world, and has an average turnover of only 2% in an industry where the average is 22%, his attitude is instructive.

On no demographic group has the IHC revolution had a greater impact than well-educated married women. Traditionally, this group has had the lowest labor participation rate as a result of several factors including: supply and demand, slow evolution of social norms and mores related to women in the workforce, and the institutionalization of discrimination (Goldin, 1990; Costa, 2000). However, as jobs available to women broadened from predominantly menial labor as maids or laundresses to include first secretarial and other "clean" office positions and later to include high-paying professional careers in law, medicine, higher education, and management, these women were drawn into the labor force. As their expectations regarding their lifetime participation in the labor force increased, so did their initial investments in education or training, and they became more likely to remain in the labor force after marriage and even after child-birth.

Nevertheless, despite dramatic increases in their labor participation, educated, married women are still much more likely than men and single women to withdraw from the workforce and thus represent a relatively large, untapped labor pool. Therefore, it makes sense for IHC dependent firms to exert a special effort to attract and retain these women. Because women are still more likely than their husbands to shoulder the greater responsibility for home-making and child-rearing, women are likely to highly value employee benefits and firm cultures that help them balance work and home responsibilities.

In this paper, we investigate whether dependence on IHC increases the likelihood that a firm will provide benefits that help employees balance work and life and will strive toward creating a family-friendly culture. To our knowledge, our approach is unique in several ways. First, we test our hypotheses using variables derived from the published results of multiple respondent surveys and archival data. Second, we present two possible indicators of IHC dependence and compare their explanatory power. Third, we offer a compelling justification for organizations' use of specifically family-friendly benefits: to counteract the possible labor market withdrawal behavior of their highly skilled female employees, thereby retaining their intellectual human capital and perhaps encouraging those employees to make even larger IHC investments. Fourth, we propose and test a likely result of family-friendly firm behavior. If family-friendly firms are better able to retain and motivate their female talent, they may be more likely than those firms that lack an emphasis on such policies to have women who reach upper levels of management. Notably, our approach draws on both the human resources management and finance fields to address questions of strategic importance to organizations seeking to maximize the value of their human assets and to those who wish to promote the advancement of women.

Background and Theory

For many of today's enterprises, the most valuable asset is skilled employees. Over the last three decades, demand for skilled employees has been rising, while demand for unskilled labor has fallen[2]. Supply of talent has also risen as more and more people invest in education and training, yet even in market downturns, firms still face competition for the best and brightest[3]. Once hired, a firm's most talented employees must also be retained and motivated to reach their potential. Failure to attract, retain, and motivate skilled employees can be costly in many ways (Capelli, 2000; Gallup, 2001; Gelade & Ivery, 2003; Hall & Parker, 1993; Staw, 1980).

Work-life benefits, such as flextime, telecommuting, job sharing and child care centers, are designed to help employees balance their work and personal lives. A large literature has explored their effective-ness in attracting, retaining, and motivating talented personnel. For example, Hall and Parker (1993) argue that workplace flexibility encourages higher levels of engagement and increases employees' psychological availability for work. Grover and Crooker (1995) find that family-responsive benefits are generally related to greater organizational commitment among employees, even when they do not directly benefit from the policies. Blau (1985) finds that extrinsic rewards, such as pay or benefits, reduce unexcused absenteeism, while intrinsic variables – career commitment, job involvement and work satisfaction – reduce excused absenteeism. Dalton and Mesch (1990) find that flexible scheduling reduces

absenteeism. Baltes, Briggs, Huff, Wright, and Neuman (1999) report that flexible and compressed workweek schedules positively affect productivity/performance, job satisfaction, absenteeism, and satisfaction with work schedule. Greenhaus and Parasuraman (1997) assert that "employees will be more creative, more committed to the organization, and more productive if they are able to manage their work and family lives effectively than if they are in a constant state of conflict and stress (p. 235)." Osterman (1995) finds that firms seeking to establish high-commitment work systems are more likely to adopt work/family programs. Eisenberger, Fasolo, and Davis-Lamastro (1990) find that "employees' general perception of being valued and cared about by the organization is positively related to (a) conscientiousness in carrying out conventional job responsibilities, (b) expressed affective and calculative involvements in the organization, and (c) innovation on behalf of the organization in the absence of anticipated direct reward or personal recognition" (p.57).

Though some work-life benefits are valued by all types of employees regardless of gender or family status, many of these benefits are particularly valued by women with children (Rodgers, 1992). Firms may take special care to attract and retain women with children for at least four reasons. First, this demographic represents the largest untapped skilled labor pool. Studies (e.g., Goldin, 2006; Juhn & Potter, 2006; Polachek, 2004) estimate that only 75% of married, female college graduates and fewer than 65% of those with children under the age of 6 are in the labor force. In contrast, approximately 8% of educated single women and men are voluntarily unemployed.

Second, married women, particularly those with children, are more likely than others to partially or fully withdraw from the labor force to attend to family responsibilities. They are also more likely to follow career paths (either by choice or discrimination) that lead to lower pay, prestige, and responsibility. Felmlee (1995) finds that married, white women were more likely than were single, white women to have experienced job changes that were interrupted by an employment break, and that these breaks had significant negative consequences for the women's occupational attainment.

Examining gender differences in physicians' pay, Sasser (2005) concludes that gender gaps in physicians' pay are driven by individual choices to balance career and family responsibilities. She reports that female physicians work about 9 fewer hours per week, are more likely to work in the relatively low-paying primary care fields and in salaried positions at institutions, and are less likely to work in high-paying surgical fields and in private practice than their male counterparts. She also finds that married, women physicians earn 11% less than others, an additional 14% less if they have one child, and 22% less if they have more than one child.

Similarly, Wood, Corcoran, and Courant (1993) find that taking time from work to care for children reduces attorneys' wages significantly. Fifteen years after their graduation from the University of Michigan Law School, the women in their sample worked 10% fewer hours and earned about 40% less than the men. The male lawyers were much more likely than women to be in private practice and more than twice as likely to be in large-firm practice. In contrast, men were much less likely than women to have worked part-time to care for their children and to practice law in the relatively low-paying areas of government and legal services.

Yet the women who choose to reduce hours or temporarily remove themselves from the labor force do not bear the costs of their decisions alone. Losing their intellectual human capital, including difficult-to-replace institutional memory, firm-specific knowledge, and relationship capital can also be extremely costly for the firms that employ them. A 2007 *Wall Street Journal* article reported on several Japanese firms' efforts to lure back women who had quit after getting married or having children (Inada, 2007). One company spokesperson noted, "There are many women who quit after we had spent time and money in training. For the company, [not hiring them back] is such a waste." (p. B1)

Even in recessionary times, the costs of losing valuable employees can be high enough to make it worthwhile to invest in talent retention. In February 2009, the *Wall Street Journal* reported on nascent career-re-entry programs at firms in the science, technology and engineering fields, stating that "many employers expect a talent shortage, partly because of high quit rates among experienced women" (Shellenbarger, 2009, p. D1). As Hewlett, Luce and Servon (2008) report, although 41% of highly

qualified scientists, engineers and technicians in lower-tier jobs are female, more than half eventually quit midcareer, just as family pressures also tend to intensify.

Third, having a reputation as a diverse and family-friendly workplace may motivate current and aspiring female employees to increase their investment in general and firm-specific human capital. All investment is motivated by the expectation of earning a return. According to human capital theory, one's incentive to invest in training increases with the expected return from the training, which depends on the time one expects to spend in the workforce (Goldin, 2006; Polachek, 2004). Therefore, if women trust their employers to support their efforts to balance work and family and believe that they can successfully pursue both their family and career goals, they may be more likely to incur the costs of acquiring human capital, including pre-employment education and training, on-the-job training, and building strong relationships with co-workers and customers.

Fourth, although firms may seek to increase gender diversity in their upper management[4], few women will rise to the executive ranks or corporate boards if they are not able to balance family commitments with their professional aspirations. Judge, Cable, Boudreau and Bretz (1995) extensively review the relevant literature as they develop their comprehensive conceptual model of objective and subjective career success. Among the individual characteristics that they list as determinants of objective career success, measured by compensation and number of promotions, are dependent responsibilities, tenure and experience, number of nights worked, hours worked, and work centrality. They hypothesize that greater dependent responsibilities will tend to decrease success while increasing the other determinants listed will tend to increase success. As studies cited above indicate, women with children are more likely than other groups to have dependent responsibilities, to reduce hours worked, and to temporarily withdraw from the workforce thereby reducing tenure and experience. Therefore, they may be less likely to rise to executive ranks unless their firms meaningfully support their simultaneous pursuit of career and family goals.

It is important to note that simply having work-life benefits on the books does not guarantee their effectiveness in attracting, retaining, and promoting talent. Unless employees feel able to use the benefits without hurting their chances for raises or promotions, the benefits will be, at best meaningless, at worst counter-productive (Blair-Loy & Wharton, 2002, 2004; Clarkberg & Moen, 2001; Greenhaus & Parasuraman (1997); Grover & Crooker, 1995).

The importance of a supportive culture is emphasized in the methodologies used by two popular 100 Best Companies to Work For lists. The application for *Fortune*'s 100 Best Companies to Work For list includes an employee survey with questions related to management credibility, job satisfaction and camaraderie and a culture audit, "which includes detailed questions about demographic makeup, and pay and benefit programs, as well as a series of open-ended questions about the company's management philosophy, methods of internal communications, opportunities, compensation practices, and diversity efforts, etc.[5]" Similarly, the *Working Mother* 100 Best Companies application includes an assessment of company culture and surveys the usage, availability and tracking of programs provided to help employees integrate home and work[6]. Such lists are a useful resource to those attempting to identify those firms that not only offer work-life benefits but also a culture that supports their use.

From the preceding literature review, we draw two hypotheses:

> *Hypothesis 1:* Firms which depend heavily on intellectual human capital (IHC) are more likely to invest in work-life benefits and take care to create a family-friendly culture; therefore they are more likely to appear on the *Fortune* 100 Best Companies to Work For and/or the *Working Mother* 100 Best Companies for Working Mothers lists.

> *Hypothesis 2:* Firms on the *Fortune* 100 Best Companies to Work For and/or the *Working Mother* 100 Best Companies for Working Mothers lists are more likely to have female executives than other firms are. Family-friendly benefits and culture help attract and retain women and make female employees less likely to remove themselves from the workforce for long periods of time, giving them more opportunity for advancement in the firm.

METHOD

Sample

To create our sample, we gathered the *Fortune* 100 Best Companies to Work For and the *Working Mother (WM)* 100 Best Companies for Working Mothers lists from 1998, the inaugural year of the *Fortune* list, through 2007. Companies wishing to be considered for the *Fortune* list apply in March by completing what the magazine describes as an "exhaustive survey process[7]" conducted by the Great Place to Work Institute®. The list is published in January or February of the following year. Applicant firms must be at least 7 years old with over 1,000 employees; they may be public or private. Once firms apply, a survey is sent to a minimum of 400 randomly selected employees from each company. The survey asks questions related to their attitudes about the management's credibility, job satisfaction and camaraderie. Each applying company also responds to the Institute's Culture Audit, which includes detailed questions about demographic makeup, and pay and benefit programs, as well as a series of open-ended questions about the company's management philosophy, methods of internal communications, opportunities, compensation practices, and diversity efforts. After evaluations are completed, if news about a company comes to light that may significantly damage employees' faith in management, the Institute may exclude that company from the list.

Companies wishing to be considered for the *WM* list apply in December. The magazine notes that their application includes some 500 questions on workforce, compensation, child care, flexibility programs, leave policies and more. It also surveys usage, availability and tracking of programs, as well as the accountability of managers who oversee them. Seven areas are assessed: workforce profile, benefits, women's issues and advancement, child care, flexible work, parental leave and company culture. Private or public firms of any size, age and industry, except work/life or child-care services, are eligible to apply. The *WM* list is published the following October.

After eliminating private firms from our sample, we matched list firms to firms with at least 1,000 employees in industries other than NAICS code 6244 (child-care services) that did not appear on a list in a given year by market capitalization. We pulled firm-specific data from Compustat for the fiscal year end date corresponding to the list firm's application year. For example, if a firm appeared on the January 1998 *Fortune* list, it would have applied in March 1997, so we pulled 1997 fiscal year end data for the list firm and its matching firm.

In the full data set the same firm will appear in the data each year that it appears on at least one of the lists, but it does not appear twice in the same year if it is on both lists. Financial and employment data for those repeat firms (and all firms in the data set) are year-specific. We will discuss regression results for the full data set and for yearly subsets.

Measures

Primary Dependent Variable

The dependent variable of hypothesis one is a binary set to one if the firm appears on either the *Fortune* 100 Best Companies to Work For or the *Working Mother* 100 Best Companies for Working Mothers list in a given year. However, our goal is not predicting presence on a list. Rather we are using a firm's presence on either list as an indicator that it offers family-friendly benefits to its employees and a supportive culture.

Intellectual Human Capital Dependence

To test our hypothesis that IHC dependence is an important inducement for firms to be family-friendly, we need a measure of IHC dependence. Much has been written on the growing primacy of intellectual human capital over fixed assets for value creation and on the consequent need to measure IHC for inclusion on firms' balance sheets. Many measures have been proposed; none of which are all-encompassing and many of which are difficult for researchers to observe. For example, Bart (2001, 321) lists several measures for which "support appears to be emerging": training as a percent of payroll,

percentage of employees trained, number of employee suggestions, and employee attitudes about the organization.

For the most part, the proposed measures are intended to measure either the firm's accumulated investment in IHC or the accumulated value that has been created by IHC. Neither of these is necessary to test our hypothesis. We don't care whether the IHC is the result of firm-provided training or previously acquired education, or how much value the IHC has created to date. We simply want an indicator of those firms that are likely to have a large percentage of employees who are highly trained and/or educated and are therefore difficult and/or costly to replace. Among the data that may be reported in a firm's financial statements and available on Compustat, labor expense per employee strikes us as the best candidate. A high labor expense per employee implies that a large number of the firm's employees are highly valued and therefore well-paid by the firm, probably because they are highly skilled and have high marginal products. If these employees were easy to replace with lower skilled workers, their wages would fall.

Other researchers have used R&D expense (Faleye & Trahan, 2006) and percentage of professionals employed (Konrad & Mangel, 2000). R&D expense is often used as it is assumed that highly educated employees are required to conduct research and design and develop new products. However, though high R&D expense is likely to be characteristic of IHC dependent software, pharmaceutical and biotech firms, it would not be useful in distinguishing other IHC dependent enterprises such as business consulting, accounting or law firms from non-IHC dependent enterprises like manufacturing firms or maid services. In contrast, labor expense per employee would. We would expect that high R&D firms, like tech firms, also have high labor expense per employee, but not all firms with high labor expense per employee, like investment banks, will have high R&D expense.

Percentage of professionals employed is not available in financial statements or on Compustat. It can only be collected via survey, which exposes the researcher to other complications including low response rates and response bias. Therefore, we do not use this measure.

We use labor expense per employee as our primary measure of IHC dependence, but also use common-sized R&D expense for comparison. We also use an alternative binary variable set to one if the firm's labor expense per employee is above the median for our sample. We consider the binary variable because we do not believe that a firm with a 10% higher labor expense per employee is necessarily 10% more IHC-dependent than a comparison firm. Instead, we believe that, on average, firms with higher labor expenses per employee are more likely to be IHC-dependent than firms that have lower labor expenses per employee. We expect our IHC measure to be positively related to the likelihood of a firm appearing on one or both lists.

Secondary Dependent Variable

To test our second hypothesis, we need a measure of women's presence and progress in the firm. Using the Execucomp database, we collected the names and genders of each person on the executive team listed in the database for each sample firm for the fiscal year end date corresponding to the list firm's application year and computed the ratio of females to males. Of the 1255 firm-years for which we have Execucomp data, 496 or 40% represent firms that did not appear on a list in that year and 759 or 60% are firms that did. In only 35% of the 1255 firm-years was there at least one woman listed on the executive team. Since more than 50% of the firm-years had no female executives, we also created a binary variable for female executives, set to one if there was at least one female executive listed and 0 if there were none.

Tight Labor Market Measure

One alternative explanation for a firm's implementation of family-friendly policies and its presence on one or both of the lists is that the firm faces tight labor markets, whether for highly skilled or relatively unskilled employees, and uses these policies to attract applicants and reduce turnover. We use both firm level and industry level variables to control for this possibility. At the firm level, we use the growth rate in employees either from the previous year to the year of list appearance or from the year of list appearance to the following year as indicators of the firm's relative demand for labor. At the industry level, we use Bureau of Labor Statistics data on the one-year growth rates from the previous year to the

year of list appearance for employees, weekly wages, and hourly wages. BLS data is provided by two-digit NAICS codes on www.bls.gov/data.

While firm level data might better indicate the firm's specific need for labor, the industry level data might better indicate the competition the firm faces in hiring. If firms in an industry have high demand for labor but face low supply, we would expect average weekly and hourly wages in the industry to be increasing. Therefore, a positive relationship between wage growth rates and presence on the list would support the tight labor market hypothesis. In contrast, high employee growth rates at the firm or industry levels would indicate high labor demand at various levels of supply and low employee growth rates might result from either low demand or extremely low and wage inelastic supply. Consequently we will rely on the industry level growth rate in either weekly or hourly wages as our primary variable to indicate tight labor markets and include the firm level employee growth rates for comparison.

Percentage of Women Employed in the Industry

Another alternative motive for investing in family-friendly policies is the relative number of women employed in the firm's industry. If the firm relies heavily on female employees, it may be more likely to offer benefits that help attract and retain them. Goodstein (1994) finds empirical support for his hypothesis that the greater the dependence of an organization on female employees, the greater its level of responsiveness to institutional pressures for employer involvement in work-family issues. Konrad and Mangel (2000) find that the percentage of women employed in an organization is positively related to the development of more work-life programs.

The percentage of women employed in an organization is also likely to increase the probability that women will reach upper management at that organization, all else being equal. While this is implied by simple statistical theory, Moss's analysis (2004) suggests another reason this may be true. As he contends, the expectation of discrimination at non-diverse workplaces and in traditionally male jobs reduces the incentive women have to obtain field-specific or firm-specific human capital, particularly when the human capital is costly to obtain. If women at firms or in industries that employ relatively large numbers of women expect less discrimination, they will be more likely to invest in human capital than will women in more male-dominated work environments. To the extent that these human capital investments are necessary to reach upper management, women in less-male dominated environments will be more likely to do so.

To estimate this variable, we use Bureau of Labor Statistics data that estimates the percentage of women employed in each super sector or industry, which is provided by two-digit NAICS codes on www.bls.gov/data.

Other Control Variables

Firm size is always an important control variable, and here it is certainly relevant. All else equal, a larger firm is more likely than a smaller firm to be able to implement some family-friendly policies, such as a child care center. Common measures of size include market capitalization, sales, and total assets. We have tried to minimize the effect of firm size on our analysis by matching list firms to non-list firms by market capitalization. Nevertheless, we include market capitalization, sales, and total assets as controls in our regressions.

Profitability is another potentially important control variable, as profitable firms might be more likely and able to "reward" employees with benefits. We use return on assets (ROA), net income standardized by total assets to reduce profitability effects.

Industry dummies based on two-digit NAICS codes are also included in the regressions to capture any industry effects beyond those related to wage and employee growth and percentage of women employed. The excluded industry is 21, Mining, Quarrying, and Oil and Gas Extraction. Codes 11 (Agriculture, Forestry, Fishing and Hunting), 55 (Management of Companies and Enterprises), 61 (Educational Services), 81 (Other Services except Public Administration), 92 (Public Administration), and 99 (unclassifiable firms) were either not present in the data or did not have labor data provided on the Bureau

of Labor Statistics website and were eliminated from the regression data set. Twenty-two of 1812 observations were eliminated for this reason.

RESULTS

Appendix A contains all of the tables described as part of the results section. Tables 1 and 2 contain correlations and descriptive statistics. In Table 1, we present the Pearson correlations among key variables and compare the means and standard deviations of those variables for the sample of list firms to those of their matching firms.

The percentage of women in the firm's industry and the firm's labor expense per employee are positively correlated, which supports our assumption that IHC jobs have encouraged women to join the labor force. The labor expense per employee and research and development expense are also positively correlated, while the percentage of women in the firm's industry and the firm's research and development expense are negatively correlated. These results are consistent with our conjecture that research and development expense primarily identifies math/science-based IHC firms, which tend to be male-dominated. There is no significant difference in market capitalization (our matching variable), sales, market-to-book ratio or industry wage growth rate between list firms and matching firms. List firms have significantly higher total assets, ROA, common-sized R&D expense, labor expense per employee, and percentage of women employed in the industry, and a significantly higher percentage of list firms have female executives.

Note that we have 906 list firms and 906 matching firms, but we lose about two thirds of our data when we require labor expense and a little less than half of our data when we require R&D expense. However, the reduction in our sample does not appear to affect the overall composition. When we compare the means of our variables for the remaining firms, average market capitalization, sales, market to book ratio and industry wage growth rates for list firms remain statistically equal to those for matching firms. List firms continue to have significantly higher averages for Total Assets, Common-sized R&D Expenses, Labor Expenses per Employee, and Percentage of Women Employed in the Industry. Matching firms continue to have a significantly higher average ROA.

Table 2 shows how firms in our sample are distributed across industries designated by two-digit NAICS Codes. The most common industries among sample firms are Finance and Insurance (52), Manufacturing (32-33) and Information (51). Comparing relative frequencies shows that firms from the Professional, Scientific and Technical Services industry (54) appear on the lists almost 3 times more often than they appear in our random sample of size-matched firms. This industry, which includes Architectural Services, Engineering Services, Testing Laboratories, Interior Design Services, Graphic Design Services, Computer Systems Design Services, Consulting Services, and Scientific Research and Development Services, is likely to be highly IHC dependent. It also includes law and accounting firms, and advertising and public relations agencies, which are also IHC dependent. Although these entities do appear frequently on the lists, they tend to be private partnerships rather than publicly traded firms and therefore are not included in our data set.

To test our first hypothesis that IHC dependent firms will be more likely to invest in family-friendly benefits and to take care to create a family-friendly culture, we use a logistic regression with a binary dependent variable set to 1 if the firm appeared on either the *Fortune* 100 Best Companies to Work For list or the *Working Mother* 100 Best Companies for Working Mothers list in a given year. The independent variables are control variables: market capitalization, total assets, sales, ROA, and the industry dummies; a tight labor market variable: the one-year growth rate in weekly wages for the industry; an IHC dependence variable: the firm's labor expense per employee; and a female-dominated industry variable: the percentage of employees who are female in the industry.

The results shown in Table 3 indicate that our IHC dependence variable, labor expense per employee, is strongly predictive of which firms will appear on a list, consistent with our hypothesis. The tight labor market variable and the female-dominance variable are not significant predictors. Of the other control variables, only total assets is significant, perhaps because, as noted earlier, larger firms are better able to

support the family-friendly benefits that require larger investments like childcare centers. Results for this model are nearly identical if we replace the one-year growth rate in weekly wages for the industry with the one-year growth rate in hourly wages for the industry, the one-year growth rate in employees for the industry, or the one-year growth rate in employees for the firm. The tight labor market variable is always insignificant and the IHC dependence variable is always positive and significant[8].

As shown in Table 4, replacing the labor expense per employee with common-sized R&D expense also yields results consistent with our hypothesis, but the model is not as strong; the R-squares have decreased relative to those in Table 3[9]. As we expected, the common-sized R&D expense appears to be a useful proxy for IHC dependence but the labor expense per employee seems to be better. In this model, total assets, sales, and ROA also seem to be significant predictors of presence on a list. The percentage of women in the industry and the tight labor market variables are again insignificant, as are the industry dummies and market capitalization.

To test our second hypothesis that firms that appear on the *Fortune* 100 Best Companies to Work For and/or the *Working Mother* 100 Best Companies for Working Mothers lists are more likely to have female executives than firms that do not appear on either list, we ran a logistic regression with the female executives binary (1 if any of the executive team listed on Execucomp is female, 0 otherwise) as the dependent variable, and the control variables and the binary that indicates whether the firm appeared on a list as the explanatory variables. The percentage of female employees in the industry is also included in the regression to test the alternative hypothesis that firms are more likely to have female executives if the firms are in female-dominated industries.

The results in Tables 5 support our conjecture that firms recognized for having family-friendly benefits and culture are more likely to have female executives. The presence on the Best Companies lists binary and two control variables, total assets and sales, are positive and significant at the p < .05 level. The percentage of women in the industry, the industry dummies, and the constant are insignificant.

If we test our second hypothesis using OLS regression with the ratio of female executives to male executives as the dependent variable and the same explanatory variables, we get similar results. The presence on the Best Companies lists binary is positive and significant, and the percentage of women in the industry is insignificant.

It should be noted that "women's issues and advancement" is listed as one of the seven areas *Working Mother* assesses when picking its 100 Best firms[10]. Therefore, it is possible that having female executives increases the likelihood of appearing on the *WM* list, rather than the hypothesized relationship that having family-friendly benefits and culture increases the likelihood of women advancing to the firm's executive team. Indeed, if we run the logistic regression with the female executives binary using only those firms that appeared on the *Fortune* list, which does not assess women's advancement, we do not find a significant relationship between list firms and female executives. However, we also fail to find a significant relationship if we run the regression using only *Working Mother* list firms. Perhaps the sizes of the split samples are too small to detect a relationship between the lists and the likelihood of having female executives, given their relative scarcity in the data.

DISCUSSION

Intellectual human capital (IHC) has become the key input for a wide variety of enterprises. Like other forms of capital necessary to the survival and growth of a business, IHC is scarce. Yet, unlike other forms of capital, firms cannot own IHC; they can only rent it from individuals who have made the substantial investments of time, effort, and sometimes money to acquire it. Their considerable investments in advanced education and training, firm-specific knowledge, experience, and/or relationships with team members or clients makes these employees quite valuable and relatively rare. The greater the investment necessary to acquire a specific skill set, the smaller the relevant labor pool will be, making employees with that skill set more difficult to replace and giving their employers greater financial incentive to make considerable efforts to hire and retain them. Women constitute a substantial portion of the skilled labor force, yet they are more likely than their male counterparts to partially or fully withdraw

from the labor force to attend to family responsibilities. Therefore, firms who rely on skilled labor may be induced to provide family-friendly benefits and develop a family-friendly culture to avoid losing the intellectual capital of their female employees. In contrast, firms that can quickly hire and train replacements have less financial incentive to be family-friendly.

Using archival firm-level and industry-level data and logistic regression analysis, we find support for our hypothesis that firms which depend heavily on intellectual human capital are more likely than other firms to offer family-friendly benefits and to foster a culture that encourages their use. Although our model is significant whether we use labor expense per employee or common-sized R&D expense as our measure of IHC dependence, our statistical results suggest that labor expense per employee is the better measure. The regression coefficient for labor expense per employee is strongly significant and the regression has higher explanatory power. Furthermore, we find that the percentage of women employed in the industry is positively correlated with labor expense per employee but negatively correlated with common-sized R&D expense. These findings are consistent with assertions in the literature that IHC jobs have pulled more women into the labor force (Goldin, 2006; Katz & Murphy, 1992; Polachek, 2004) and with our conjecture that R&D expense has limitations as a proxy for IHC dependence because it only captures IHC firms that rely on math or science, fields which still attract relatively few women (Gibbons, 2008).

We also investigate whether family-friendly firms are more likely to have female executives, perhaps because they do a better job of retaining and promoting their talented women than unfriendly firms do. We find limited support for this hypothesis using logistic and OLS regression models. Firms that have appeared on either of the Best Companies lists are more likely to have female executives and tend to have higher ratios of female to male executives than firms that have not appeared on the lists.

However, both regression models have relatively weak explanatory power. It may be that other variables omitted from the models influence the promotion of women, or that family-friendly policies and 100 Best lists are relatively new phenomena and insufficient time has passed to allow large numbers of the women who have benefited from these policies to rise to executive positions. Furthermore, the relationship between the lists and the presence of female executives is not significant when we split our sample and look at only *Fortune* list firms or only *Working Mother* list firms. We split the sample to examine whether the statistical relationship held for both lists and to consider whether the selection criteria related to women's advancement for the *WM* list were driving the relationship. We cannot rule out the selection criteria as the root cause of our positive findings, yet the lack of statistically significant findings for the *Working Mother* only sample suggests that the relationship is not tautological. Women's advancement is, after all, only one of many criteria used to create the list, and having female executives is neither necessary nor sufficient to win a spot on it. We surmise that the sample size when split is too small to identify any existing relationships, particularly given the limited incidence of female executives.

Finally, although we have hypothesized that being family-friendly increases the likelihood of having female executives, the direction of this relationship cannot be guaranteed. Females who rise to upper management may be effective campaigners for family-friendly policies. Yet, Wade's (2006) argument suggests our hypothesis is more likely. She notes that females who rise through the ranks at firms that lack a family-friendly culture have generally had to make considerable family sacrifices and refrain from advocating greater work-life balance in order to demonstrate institutional fit and loyalty.

Our hypothesis is also based on the assumption that a woman in the top management ranks has been in the organization for many years, that she has children and that the organization's practices supported her advancement. Future longitudinal research should examine more closely whether the female executives at the Best Companies firms are indeed long-tenured employees or whether they have been recently hired from the outside, and whether they have children.

Limitations

Although the findings of the current study are highly consistent with those of others, they should be interpreted within the context of potential limitations. First, our reliance on archival data puts us at the mercy of what firms choose to report. Our key variables: labor expense, number of employees, and

research and development expense are not required entries on financial statements. Thus, we lose a significant portion of our potential sample. Furthermore, firms do not report the demographic makeup of their labor force, which compelled us to rely on industry-level data to estimate a firm's dependence on female employees.

These data issues might suggest that a survey-based method would be more appropriate. However, surveys also present several shortcomings, such as non-response bias. In particular, many studies of human resource practices rely on a single respondent to report firm-level information. Gerhart, Wright, McMahan, and Snell (2000) caution that measurement error caused by single-rater assessments may lead to considerable bias. The advantages and disadvantages of using archival data relative to survey-based data make it important to validate firm-specific archival results with survey-based results and vice-versa. Our results relating an IHC measure, labor expense per employee, to the presence of work-life policies and selection for the 100 Best lists are consistent with Konrad and Mangel's (2000) finding that their IHC measure, percentage of professionals employed by the firm, is positively related to its development of work-life programs. As their study relies on data from questionnaires sent to senior executives responsible for HR, the findings of the two substantiate one another.

Of course, it is possible that neither IHC measure perfectly captures what we are really trying to assess, which is a firm's dependence on intellectual human capital. We might approach this via a survey question that specifically asks a firm's HR manager to rate its IHC dependence on a specified scale, but even this is subject to statistical noise from non-response bias and single-rater bias. In particular, it would be impossible to judge whether one person's 5 rating, for example, is equivalent to another's.

In short, noisy proxies are a fact of life. To compensate for expected noise, we run our regressions with more than one proxy for our key variable to ensure that the relationship we report is robust to our choice of proxies. Given the noise that we expect, we also expect relatively low R-squareds and pay more attention to the significance of variable coefficients. We are not trying to fully predict which firms will be chosen for the lists, but rather simply to see whether IHC dependence is one significant predictor after controlling for other likely predictors.

A second constraint is that we are unable to perfectly identify firms with work-life benefits and supportive cultures. Although we are confident that the firms on the lists meet this requirement, we cannot be certain that our matching firms do not. Some matching firms may be IHC dependent and offer work-life benefits but chose not to apply for the lists or may be ranked below 100. However, this limitation biases against finding results consistent with our hypothesis. Therefore if we were able to perfectly identify, our results would likely be in the same direction but stronger.

Finally, we rely on Bureau of Labor Statistics data to estimate labor market tightness and a firm's dependence on female labor. BLS data are compiled by two-digit NAICS codes, which may not provide sufficient industry specificity. If we are not adequately separating those firms in our sample that face tight labor markets and/or depend heavily on female labor from those that do not, we are biasing our results against finding statistically significant regression coefficients for these variables.

Nevertheless, we believe that it is the difficulty of replacing their employees' intellectual human capital that motivates firms to focus on work-life issues. Firms needing to fill relatively unskilled positions, whether in female-dominated industries or otherwise, would likely find it easier to offer slightly higher wages, increase advertising of positions, and provide any limited training needed. While some work-life benefits, like flextime, may be relatively easy to adopt and cheap to provide, others like child care centers require significant investments. Furthermore, it is difficult and time-consuming to develop a culture that supports work-life balance. Firms who temporarily adopt policies to address labor shortages are unlikely to generate the employee survey responses necessary to be identified as a 100 Best firm.

Future Research Directions
Our work here suggests that IHC dependent firms use family-friendly policies and cultures to compete for and retain their most important resource - talent. We leave it to future studies to investigate whether this strategy is successful and which policies yield the most positive net effects. For example, child care centers require larger investments than telecommuting or flextime; do they yield a higher

return? They may be harder for competitors to copy and could yield better results when work is accomplished in teams. (Child care centers may bring people to the same place at the same time, while flextime and telecommuting may tend to disperse team members.) However, they benefit only those employees with young children, while flextime and telecommuting could benefit all employees.

Moreover, if such policies are primarily intended to retain women, it would be useful to examine which policies have the greater effect on women's withdrawal behavior. Perhaps the specific mix of policies offered is less important than a firm culture that values its working parents and recognizes the need to help them balance their responsibilities.

There is also much more work that can be done to examine the determinants of intellectual human capital investment. In particular, do young women consider their expected time in the work force and/or expected family size when choosing classes in high school, majors in college or whether to pursue advanced degrees? Are these women aware of family-friendly firms when making these choices, and if so, does this awareness influence their choices? Once on the job, do women working at family-friendly firms expect to spend more time in the work force and therefore invest more in IHC than women at unfriendly firms?

Finally, given the consensus surrounding the multi-dimensional nature of intellectual capital and the central role that an organization's people play in both intellectual human and intellectual social capital, future research should examine which investments by organizations result in maximizing both facets of intellectual capital. Previous research has indicated that the impact of human resources interventions on productivity is derived through their ability to build human capital, which, in turn, drives performance (Youndt & Snell, 2004). Given current economic constraints and the need for organizations to choose fiscally sound investments, knowledge regarding which policies and benefits result in the most substantial outcomes is imperative.

CONCLUSION

This study suggests that firms which depend heavily on intellectual human capital (IHC) are more likely to offer their employees benefits that help them balance work and life responsibilities and to foster a corporate culture that supports employees' use of these benefits than are firms which do not depend on intellectual human capital. In contrast, neither tight labor markets nor a relatively high percentage of female employees in the industry appear to explain why firms choose to be family-friendly. Furthermore, being a family-friendly firm may increase the probability that the firm will have female executives, but being in an industry that has a high percentage of females does not.

In addition to providing insight into the relationship between high IHC workplaces and prevalence of family-friendly offerings, this study provides new and unique insight into the best measures of IHC for future use. Our comparative regression results indicate that labor expense per employee is a more powerful proxy for IHC dependence than is common-sized research and development expense, likely because R&D only identifies IHC firms in math and science-related fields.

By combining techniques and concepts typically associated with strategic human resources studies with variables typically found within the finance realm, the current study makes an important contribution to our knowledge of the relationships among intellectual human capital, family-friendly human resources programs, the advancement of women in the workplace, and organizational performance. The ability to attract, develop, and retain the best employees will continue to be a major strategic initiative for organizations striving to excel in the current dynamic environment.

ENDNOTES

[1] http://money.cnn.com/2010/01/21/technology/sas_best_companies.fortune/index.htm accessed on March 4, 2010.

[2] Trends in the demand, supply and wages for skilled and unskilled labor have been extensively studied and documented. See, for example, Black and Juhn (2000), Blau and Kahn (1997), Holzer (1998), Katz and Murphy (1992), and Quinn (1992).

[3] "Despite Recession, High Demand for Skilled Labor," Louis Uchitelle, *The New York Times*, June 24, 2009. Dess and Shaw (2001, p. 447) state, "Thus, on balance, the attraction and retention of talent in the knowledge economy will likely be more salient issues than downsizing and restructuring."

[4] Weisul (2003) reports that female representation on corporate boards is rising and that several large firms have hired search firms specializing in finding female directors. Burgess and Tharenou (2002) summarize eight arguments from the literature why women are needed on boards. Moss (2004) asserts that women rationally choose diverse work places because they are unable to identify ex-ante those firms where they might experience discrimination and harassment that can inhibit their careers. Gender diversity, particularly among upper management, is a credible signal that the firm is unlikely to feature gender discrimination.

[5] From

http://money.cnn.com/.element/ssi/sections/mag/fortune/bestcompanies/2008/box_how.popup.html. Accessed on January 26, 2010.

[6] From http://www.workingmother.com/BestCompanies/2009/09/100-best-methodology. Accessed on January 26, 2010.

[7] The survey is described in detail in Fulmer, Gerhart, and Scott (2003). Therein they note the advantages of using a multiple respondents survey such as those used to create the Fortune and Working Mother lists. Further detail can be found at

[8] http://money.cnn.com/.element/ssi/sections/mag/fortune/bestcompanies/2008/box_how.popup.html. The WM application process is described at http://www.workingmother.com/BestCompanies/2009/09/100-best-methodology.

[9] A colleague wondered whether we might be over-controlling for industry effects by including industry dummies alongside the industry-level labor market and percentage of women variables. When we remove the dummies, the results are qualitatively the same. The explanatory power of the model decreases slightly, and the significance levels of the industry-level variables increase slightly but neither variable is significant at the 5% level. The IHC variable remains significant at the 1% level.

[10] Regression results are similar if we replace missing R&D values with zeroes under the assumption that firms choose not to report R&D expense when it is negligible.

[11] Downloaded from http://www.workingmother.com/BestCompanies/2009/09/100-best-methodology on January 26, 2010.

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TABLE 1
CORRELATIONS AMONG KEY VARIABLES AND COMPARISON OF MEANS OF KEY VARIABLES FOR LIST FIRMS AND MATCHING FIRMS

	Market Cap.	Total Assets	Sales	Market to Book Ratio	ROA	Common -sized R&D Expense	Labor Expense per Employee	% of Women Employed	Ind. One-Year Growth Rate	Female Executives
Total Assets	0.41**	1								
Sales	0.62**	0.50**	1							
Market to Book Ratio	0.08**	-0.07*	-0.04	1						
ROA	0.10**	-0.14**	-0.03	0.04	1					
Common-sized R&D Expense	0.07	-0.12**	-0.21**	0.04	-0.15**	1				
Labor Expense per Employee	0.17**	0.41**	0.18**	-0.09	-0.13*	0.51**	1			
Percentage of Women Employed in Industry	-0.03	0.38**	0.02	-0.08**	-0.16**	-0.17**	0.20**	1		
Industry One-Year Growth Rate in Weekly Wages	0.01	-0.01	-0.02	0.01	-0.01	0.06	-0.02	0.01	1	
Female Executives Binary	-0.02	0.09**	-0.04	0.03	0.02	0.02	0.10	0.08**	-0.03	1
Mean – List Company	42,025	114,442	22,781	4.64	0.06	0.10	100.59	0.44	0.07	0.39
SD – List Company	57,066	275,138	34,025	6.38	0.11	0.08	85.36	0.15	0.29	0.49
N – List Company	906	906	906	906	906	535	287	756	757	759
Mean – Matching Company	41,746	89,768	26,042	4.12	0.05	0.06	60.86	0.41	0.29	0.30
SD – Matching Company	56,359	257,499	42,004	14.7	0.12	0.10	34.98	0.15	3.74	0.46
N – Matching Company	906	906	906	906	906	487	328	482	493	496
T statistic	-0.11	-1.97*	1.82	-0.98	-2.05*	-6.72**	-7.36**	-3.44**	1.32	-3.18**

Note: *Correlations or differences between means are significant at the 0.05 level (2-tailed);
**Correlations or differences between means are significant at the 0.01 level (2-tailed).

TABLE 2
DISTRIBUTION OF SAMPLE FIRMS ACROSS INDUSTRIES

NAICS	Frequency	% in full sample	Frequency among list firms	Frequency among matching firms	Ratio of list firms vs. matching firms in
IND 11 Agriculture, Forestry, Fishing & Hunting	5	0.3	1	4	0.25
IND 21 Mining, Quarrying, & Oil & Gas Extraction	32	1.8	3	29	0.10
IND 22 Utilities	53	2.9	12	41	0.29
IND 23 Construction	11	0.6	6	5	1.20
IND 31 Manufacturing	116	6.4	59	57	1.04
IND 32 Manufacturing	313	17.3	171	142	1.20
IND 33 Manufacturing	336	18.5	170	166	1.02
IND 42 Wholesale Trade	21	1.2	7	14	0.50
IND 44 Retail Trade	70	3.9	44	26	1.69
IND 45 Retail Trade	38	2.1	22	16	1.38
IND 48 Transportation & Warehousing	22	1.2	11	11	1.00
IND 49 Transportation & Warehousing	6	0.3	0	6	0.00
IND 51 Information	267	14.7	92	175	0.53
IND 52 Finance & Insurance	381	21	228	153	1.49
IND 53 Real Estate & Leasing	5	0.3	1	4	0.25
IND 54 Professional, Scientific & Technical Services	67	3.7	50	17	2.94
IND 56 Admin & Support & Waste Mngmnt & Remediation Services	6	0.3	0	6	0.00
IND 62 Health Care & Social Assistance	16	0.9	8	8	1.00
IND 71 Arts, Entertainment, & Recreation	2	0.1	0	2	0.00
IND 72 Accommodation & Food Services	28	1.5	19	9	2.11
IND 99 unclassifiable firms	17	0.9	2	15	0.13
Total	1812	100	906	906	N/A

TABLE 3
RESULTS OF LOGISTIC REGRESSION ANALYSIS FOR PREDICTION OF INVESTMENT
IN FAMILY-FRIENDLY POLICIES USING LABOR EXPENSE PER EMPLOYEE
AS PROXY FOR IHC DEPENDENCE

Variables	B	$SE\ B$	e^B
Market Capitalization	0	0	1
Total Assets	0 *	0	1
Sales	0	0	1
ROA	-0.438	2.01	0.645
Industry One-Year Growth Rate in Weekly Wages	-1.358	6.938	0.257
Labor Expense per Employee	0.017 **	0.003	1.017
Percentage of Women Employed in Industry	5.538	5.663	254.09
IND 22 Utilities	19.311	13177.6	2.4E+08
IND 23 Construction	22.468	13177.6	5.7E+09
IND 31 Manufacturing	19.438	13177.6	2.8E+08
IND 32 Manufacturing	19.995	13177.6	4.8E+08
IND 33 Manufacturing	20.059	13177.6	5.1E+08
IND 42 Wholesale Trade	41.641	31325.7	1.2E+18
IND 44 Retail Trade	-1.496	26675.3	0.224
IND 48 Transportation & Warehousing	20.646	13177.6	9.3E+08
IND 49 Transportation & Warehousing	-0.563	22132.9	0.57
IND 51 Information	18.292	13177.6	8.8E+07
IND 52 Finance & Insurance	18.602	13177.6	1.2E+08
IND 53 Real Estate & Leasing	40.576	42298	4.2E+17
IND 54 Professional, Scientific & Technical Services	18.343	13177.6	9.3E+07
IND 56 Admin & Support & Waste Mngmnt & Remediation Services	-1.533	42298	0.216
IND 62 Health Care & Social Assistance	-3.406	24005.5	0.033
IND 72 Accommodation & Food Services	18.255	13177.6	8.5E+07
Constant	-22.884	13177.6	0

Notes: N = 611; Cox & Snell R^2 = .210 & Nagelkerke R^2 = .281;   **p < .01   *p < .05

TABLE 4
RESULTS OF LOGISTIC REGRESSION ANALYSIS FOR PREDICTION OF INVESTMENT IN FAMILY-FRIENDLY POLICIES USING COMMON SIZED R&D AS PROXY FOR IHC DEPENDENCE

Variables	B	$SE\ B$	e^B
Market Capitalization	0.00	0.00	1.00
Total Assets	0.00 **	0.00	1.00
Sales	0.00 **	0.00	1.00
ROA	2.18 **	0.76	8.82
Common Sized R&D	8.56 **	1.19	5,204.2
Percentage of Women Employed in Industry	11.82	6.84	1.4E+05
Industry One-Year Growth Rate in Weekly Wages	6.98	5.41	1,070.7
IND 22 Utilities	41.25	41,965.6	8.2E+17
IND 23 Construction	0.55	30,875.9	1.74
IND 31 Manufacturing	19.64	12,067.9	3.4E+08
IND 32 Manufacturing	19.11	12,067.9	2.0E+08
IND 33 Manufacturing	19.00	12,067.9	1.8E+08
IND 42 Wholesale Trade	19.02	12,067.9	1.8E+08
IND 44 Retail Trade	18.14	12,067.9	7.6E+07
IND 45 Retail Trade	17.73	12,067.9	5.0E+07
IND 51 Information	16.36	12,067.9	1.3E+07
IND 52 Finance & Insurance	14.16	12,067.9	1.4E+06
IND 53 Real Estate & Leasing	-3.93	30,868.5	0.02
IND 54 Professional, Scientific & Technical Services	18.59	12,067.9	1.2E+08
IND 62 Health Care & Social Assistance	-7.46	19,391.4	0.00
IND 71 Arts, Entertainment, & Recreation	-3.17	41,965.6	0.04
IND 72 Accommodation & Food Services	18.25	12,067.9	8.4E+07
Constant	-23.40	12,067.9	0.00

Notes: N = 1005; Cox & Snell R^2 = .162 & Nagelkerke R^2 = .217;   **$p < .01$ *$p < .05$

TABLE 5
RESULTS OF LOGISTIC REGRESSION ANALYSIS FOR PREDICTION OF PRESENCE OF FEMALE EXECUTIVES

Variables	B	$SE\ B$	e^B
Market Capitalization	0.00	0.00	1.00
Total Assets	0.00 **	0.00	1.00
Sales	0.00 **	0.00	1.00
ROA	0.45	0.64	1.57
Percentage of Women Employed in Industry	-6.80	6.10	0.00
IND 22 Utilities	1.56	0.96	4.75
IND 23 Construction	-0.04	1.00	0.96
IND 31 Manufacturing	2.00	1.15	7.39
IND 32 Manufacturing	1.88	1.14	6.57
IND 33 Manufacturing	1.07	1.15	2.90
IND 42 Wholesale Trade	1.79	1.29	6.01
IND 44 Retail Trade	3.73	2.27	41.55
IND 45 Retail Trade	3.61	2.29	36.84
IND 48 Transportation & Warehousing	-0.33	1.47	0.72
IND 49 Transportation & Warehousing	1.59	1.53	4.89
IND 51 Information	2.98	1.99	19.58
IND 52 Finance & Insurance	3.89	3.20	48.72
IND 53 Real Estate & Leasing	-17.54	40,193.0	0.00
IND 54 Professional, Scientific & Technical Services	2.49	2.13	12.11
IND 56 Admin & Support & Waste Mngmnt & Remediation Services	2.20	2.23	8.99
IND 62 Health Care & Social Assistance	5.86	4.12	349.70
IND 71 Arts, Entertainment, & Recreation	-17.72	40,193.0	0.00
IND 72 Accommodation & Food Services	2.46	2.49	11.70
On List	0.27 *	0.13	1.31
Constant	-0.34	1.04	0.71

Notes: N = 1238; Cox & Snell R^2 = .063 & Nagelkerke R^2 = .087; **p < .01   *p < .05