# Human Capital and Its Effect on Entrepreneurship: A Key Component or Much Ado about Nothing?

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Paper prepared for presentation at the
American Agricultural Economics Association Annual Meeting,
Providence, Rhode Island July 24-27, 2005

JEL Codes: J230, M130

Keywords: Entrepreneurship, Business Start-up, Human Capital

## Introduction

With the recent economic situation, a great deal of emphasis has been placed on the importance of entrepreneurs in stimulating economic growth, as well as on the essential elements of successful new venture creation. Small business development centers and universities throughout the United States routinely hold entrepreneurial workshops in an attempt to further educate entrepreneurs on those factors considered to be key components of successful new business ventures. Within the entrepreneurship literature, three main factors of capital have been recognized as essential elements of the entrepreneurial process: human, financial and social. In an entrepreneurial context, human capital consists of the skills, experience and education an entrepreneur brings to the venture, financial capital includes the debt or equity funds an entrepreneurs has available for venture start-up, and social capital encompasses family members, social networks, connections, etc. that may potentially be helpful resources in business establishment.

Since human capital is the most accessible form of capital in terms of assistance strategies, small business development centers and universities allocate a great deal of time and funds to developing this form of capital through skills training, record-keeping, business plan assistance, etc. Many studies have been conducted to determine the impact of human capital factors, although they have not directly tied results to implications they may hold for future small business assistance strategies.

This study is aimed at identifying the relative impact of human capital on entrepreneurs who are approaching firm birth in comparison to the impacts of financial and social capital. We use data from a print survey to identify the importance of human

capital variables in participation in a business start-up relative to demographic, community demographic, financial capital, and social capital variables. Results from this analysis may provide information to entrepreneurs regarding key human capital components of start-up success such as education, previous start-up experience, completing a business plan, etc., and may also assist small business development entities in deciding the best allocation of their time and funds for entrepreneurial seminars and workshops.

## Background

Entrepreneurs transition through several stages during the entrepreneurial process. Reynolds et al (2002) identified three stages within the entrepreneurial process. The first stage consists of the entire population of individuals from which entrepreneurs are identified. During the progression of this stage, the first transition point, business conception, occurs. Conception serves as a signal for when the individual decides to start a business. Gestation is identified as the second stage in the process and consists of activities associated with the start-up effort, such as gaining capital, building social networks, and/or counseling with a Small Business Development Center. The transition point of gestation is known as firm birth, which leads to the final stage of the process– infancy. Infancy is known to be the riskiest stage of the entrepreneurial process and is estimated to last for approximately two years. At this stage it is imperative that the firm use the resources gained in the gestation period to its utmost advantage. Upon entering the infancy stage, there are three possible outcomes: firm growth, survival, or termination (Reynolds et al, 2002). The preliminary portion of the study targets entrepreneurs

approaching the firm birth transition point. Within the parameters of Reynolds et al (2002), entrepreneurs were identified and their characteristics were reported. The impact of those characteristics on their success or failure, however were not captured.

## Human Capital

Many studies have been conducted to determine the impact of human capital factors on entrepreneurship. In particular, a major focus has been placed on industry experience and general human capital in determining the success of entrepreneurs in firm foundation. The importance of education as a form of general human capital has been demonstrated in several studies. It has been found that higher education levels indicate an increased likelihood to participate in firm foundation and demonstrate a significant impact on the performance of the new venture (Cooper et al; Robinson and Sexton; Bates; Reynolds 1997b; Reynolds et al, 2002,). Although education as an indicator of human capital was shown to be relevant in start-up participation, previous work experience, was not shown to be a statistically significant factor in predicting participation in a start-up or in predicting start-up success (Davidsson and Honig, 2000).

Some argument has also been made regarding the effectiveness of small business assistance programs in improving human capital. Davidsson and Honig (2003) indicated that social capital seemed to play a more integral role in the success of the entrepreneur than did human capital. Chrisman, Gatewood, and Donlevy found in their study of efficiency and effectiveness of outsider assistance programs to entrepreneurs in both rural and non-rural states that assistance programs were probably capable of addressing and dealing with the needs of entrepreneurs. Although previous research has identified the

importance of human capital, little is known regarding the impact of human capital relative to financial and social capital in start-up participation.

## Data

The data used in this analysis were collected through print survey during small business development workshops hosted by either the Indiana Small Business Development Centers or Purdue University. One hundred twenty-eight entrepreneurs were contacted, and sixty-five agreed to participate in the two year study, yielding a response rate of approximately 51%. The preliminary survey instrument used in this analysis was targeted at entrepreneurs who were approaching firm birth and requested data regarding: personal demographics, community demographics, human capital, financial capital, and social capital. Table 1, shows some of the interesting variables obtained through the survey instrument. Percentages of participants involved in start-up with regards to specific variables are reported.

Within the study 26% of the entrepreneurs have participated in a business start-up. Approximately 85% of participants in the study were recruited from SBDC workshops; whereas, the remaining 15% attended a Purdue University workshop. Most of the participants have lived in their present county of residence for at least two years; 32% have lived there for two to five years, 23% have lived there for 6-10 years, and 42% have lived there for 10 or more years.

Respondents were asked to indicate their demographic categories. Approximately 6% of the respondents who have participated in a start-up are between the ages of 18-25, 82% are between the ages of 25-44, and 12% fall into the 45-64 year category. Reynolds

et al (2002) found in their study that among the most active in entrepreneurship were young men ages 25-34. The data from our study indicates that the most active entrepreneurs are in the 26-44 year age range, similar to the results of the aforementioned study. Unlike the Reynolds et al (2002) study, however, approximately 58% of the respondents are female and 42% are male. Of those participants involved in a start-up, approximately 70% are female and 30% are male. Reynolds et al (2002) also studied race as a demographic factor. Within their study it was found that blacks were 50% more likely than whites to participate in a start-up. Of the 17 participants initiating start-ups in our study, approximately 76% are white and 24% are black.

Of the total participants only 11% do not have a major retail chain, such as a Wal-Mart, K-Mart, or Target, within their respective community of residence. Approximately 8% of the entrepreneurs surveyed perceive their community economic status as deteriorating, while the remaining 92% view their community economies as either stable (46%) or growing (46%).

Human Capital Variables

Thirty-five percent of entrepreneurs surveyed have at least some college, and 33% hold at least a bachelor's degree. The entrepreneurs who have participated in a start-up generally have some college or higher level of education. From the data it was discovered that approximately 6% of those participating in a start-up have less than a high school education; whereas, 41% have some college, 24% have a bachelor's degree, and 29% have a graduate degree. Very similar to the data gathered for this study, Reynolds et al (2002) indicated that those who finish high school and enter some form of

higher education are more likely to become involved in the entrepreneurial process. Of the entrepreneurs surveyed, more than 58% have attempted a business plan. Approximately 70% of entrepreneurs participating in a start-up have at least attempted a business plan for their venture.

Financial and Social Capital Variables

For this study, net worth was used as a proxy for income. Forty percent of entrepreneurs indicated having a net worth of $100,001 or above. Reynolds et al (2002) indicated that individuals with higher household income were more likely to participate in the entrepreneurial process. Most entrepreneurs in this study were either in the lower or higher categories of net worth. Of those indicating participation in a start-up, approximately 29% indicated that they have a net worth of $50,000 or less, 18% reported a net worth of $50,001 to $75,000, 12% claimed a net worth of $75,001 to $100,000, and 41% indicated a net worth of more than $100,000. Of the sixty-five study participants, 83% indicated that either they or someone within their household own their place of residence. Reynolds et al (2002) indicated that it is unclear whether household ownership induces entrepreneurial activity or vice versa. In this study, 70% of those indicating start-up own their place of residence.

Approximately 42% of the study respondents indicated that either one or both of their parents have been self-employed at some time. With those entrepreneurs indicating participation in a start-up, approximately 41% indicated having parents who are/were self-employed.

## Model and Results

A binomial logistic regression model was formulated using the preliminary results to determine the relative impact of human capital on an entrepreneur's participation in a small business start-up. The binomial logistic regression model applicable to this is shown in Equation 1.

$$\begin{aligned} &start^* = x\beta + \varepsilon \\ &\left\{ \begin{array}{l} start = start^* \text{ if } start^* > 0 \\ start = 0 \text{ otherwise} \end{array} \right\} \end{aligned} \tag{1}$$

Twelve variables were selected for assessment within the model from the 63 total variables available. The following describes those variables selected for the analysis. The conceptual model can be viewed in Equation 2, where $\alpha$ and $\beta$ are the estimated coefficients.

$$\begin{aligned} START^* = {} & \alpha + \beta_1 PU + \beta_2 LR1 + \beta_3 LR2 + \beta_4 LR3 + \beta_5 FEM + \beta_6 CHAINY + \\ & \beta_7 GROW + \beta_8 STABL + \beta_9 COLLEG + \beta_{10} BACH + \beta_{11} GRAD + \\ & \beta_{12} PSTARTY + \beta_{13} BPLANY + \beta_{14} HHOY + \beta_{15} NW2 + \beta_{16} NW3 + \\ & \beta_{17} NW4 + \beta_{18} SEPY \end{aligned} \tag{2}$$

Each entrepreneur surveyed either has participated in a start-up within the past six months (START =1) or has not (START = 0). Eleven variables were selected to explain the dependent variable START. Those variables represent: place of participation (PU = 1, SBDC = 0), length of residence in county (LR1, LR2, LR3, LR4), gender (FEM = 1, MALE = 0), presence of a major retail chain in the community, CHAIN (yes = 1, no = 0), economic state of the community (GROW, STABL, DETER), education level (ELEM, JHIGH, HIGH, COLLEG, BACH, GRAD), previous start-up experience PSTART (yes = 1, no = 0), business plan attempt BPLAN (yes = 1, no = 0), household ownership HHO

(yes = 1, no = 0), networth of household (NW1, NW2, NW3, NW4), and self employed parents SEP (yes = 1, no = 0).

The binary logistic regression results for the start-up model can be found in Table 2. The regression analysis indicated that four variables were statistically significant at the 5% level: GRAD, BPLANY, HHOY, and NW2. Two variables, CHAINY and NW4, were statistically significant at the 10% level.

A great deal of personal demographic information was requested in order to gain a greater insight into the effect of those factors on participation in a business start-up. Three personal demographics variables were selected as part of the model: location of study participation, length of residence in county, and gender. However, none of the demographic variables tested were statistically significant.

Two variables represented the community demographics section: presence of a major retail chain and perceived economic status of the community. It was expected that the presence of a major retail chain in the community, such as Wal-Mart, Target, K-Mart, etc. would indicate sufficient infrastructure in an area to support that respective store and thus, would also have the ability to support small businesses. Having a major retail chain within the community was positive as expected, and was statistically significant at the 10% level. The entrepreneur's perception of the economic status of his/her respective community was not statistically significant.

Educational level was used within the model in an attempt to determine the effect education has on an entrepreneur's participation in a business start-up. Through the results of the model, it was found that COLLEG, BACH, and GRAD all had a positive effect on participation in a start-up. GRAD was statistically significant at the 5% level.

Although COLLEG and BACH both have positive coefficients, they are not statistically significant. The results indicate that those possessing a graduate degree are more likely to participate in a small business start-up, holding all else equal. Bates (1995) found that when differences in industry are controlled in examining the role of education, a positive relationship between increased education and entrepreneurship was found to exist. In the study conducted by Reynolds et al. (2002), it was found that those with at least some post high school education were more likely to have participated in start-up activities.

Questions pertaining to previous business start-up efforts were also asked in the human capital portion of the survey instrument. Taking the learning curve into consideration, it would be expected that an entrepreneur with previous business start-up experience (PSTART) would be more likely to participate in a current business start-up. In the results of the model, however, previous start-up experience was not statistically significant.

A great deal of emphasis is placed on the importance of business plan creation in many workshops designed for entrepreneurs. The business plan attempt variable, BPLAN, was tested to determine the importance of a business plan attempt in actually participating in a small business start-up. It was predicted that having attempted a business plan would positively affect an entrepreneur's involvement in a start-up. The results of the model indicate that having attempted a business plan does indeed have a positive and statistically significant effect at the 5% level. These results indicate that an entrepreneur who has attempted a business plan would be more likely to participate in a business start-up than an entrepreneur who has not attempted a business plan.

Household ownership HHOY indicates access to equity capital, which serves as a major source of funding for entrepreneurial activities. Household ownership was negative and statistically significant at the 5% level. Gartner et al (2002), however, determined that it is was unclear whether home ownership causes entrepreneurial activity or entrepreneurial activity causes home ownership. The results of this study indicate that household ownership negatively affects participation in a start-up.

Networth was used as a proxy for income. In the PSED study, Gartner et al (2002) found that those with higher household income were more likely to become entrepreneurs. It was expected that having a networth of $50,000 or more would have a positive effect on an entrepreneur's participation in a business start-up. NW 2 (50,000 to 75,000) and NW 4 (over 100,001) were statistically significant at the 5% level and 10% level, respectively.

Davidsson and Honig (2003) found a strong correlation between being an entrepreneur and having parents who are or were self-employed. Therefore, it was expected that having parents who are or who had been self employed would positively effect participation in a business start-up. The results, however, indicate that having self-employed parents is not a statistically significant factor is business start-up.

Probabilities

Probabilities were calculated to demonstrate the combined affect of the variables on participation in a start-up and are shown in Table 3. Human capital variables are included and excluded from the calculations to determine if they have any substantial

affect on the probability of participating in a business start-up. The probabilities for the variables within the logit model were calculated using Equation 3.

$$\hat{P} = F(X_i\hat{\beta}) = \frac{\exp(X_i\hat{\beta})}{1+\exp(X_i\hat{\beta})} \quad (3)$$

For example, a female with a retail chain in the community, who has a graduate degree, has attempted to write a business plan, owns a home, and has a net worth of $50,001-$75,000 would have an approximately 99% probability of participating in a business start-up. If the gender variable were changed to represent a male subject with the same characteristics, then the probabilities of participating in a start-up would decrease slightly to approximately 97.75%, indicating that gender does not play a major role in determining participation in a start-up.

In another example, a female participant in a Purdue workshop, who has lived in her current county 6-10 years, with a major retail chain in the community, who perceives her community as stable, has a graduate degree, owns a home, has a net worth of $50,001 to $75,000, and has parents who are/were self-employed would have a probability of approximately 61% for participating in a start-up. All else remaining the same, if the major retail chain factor were removed, the probability would decrease to a mere 1.5%.

To demonstrate the importance of human capital variables within the model, we can compare the results of a male who attended a Purdue workshop, has lived in his current county for two to five years, has a retail chain within his community, perceives the community as stable, has a graduate degree, has been involved with a business start-up, has attempted to write a business plan, owns a home, has a net worth of $50,001 to $75,000, and has parents who are/were self-employed to an entrepreneur who has a high

school degree or less, has not had previous start-up experience, and has not attempted to write a businesses plan. Holding all else constant, the man with the graduate degree, previous start-up experience, and business plan attempt has a probability of approximately 99.9% for participating in a start-up; whereas, the man who has a high school degree or less, no previous start-up experience, and has not attempted to write a business plan has only a 38.2% chance of participating in a start-up. Simply factoring in an attempt to write a business plan for the latter man increases his probability of participating in a start-up to 82.8%. These results indicate that human capital factors within the model have a major effect on whether or not the individual participates in a business start-up.

## Discussion

Although it is believed that in general this analysis is sound and applicable to a more general population, there are some limitations within the study. One such limitation deals with the size of the sample. It has been noted in a nation-wide scale study similar in nature to this analysis that, "Finding such individuals [entrepreneurs in the gestation stage] is no small problem." Since only a very small proportion of the population of working-age adults is likely to be involved at any particular moment in firm creation, identifying a "generalizable" sample of such individuals is extremely difficult (Gartner, et. al, 2004). Within the confines of Indiana, this study appears to have a credible sample size in comparison to previous studies. It is also a limitation to the study that a convenience sample of entrepreneurs was used. Most of the needs and problems arising in entrepreneurship are common among all entrepreneurs, however, not only to those

attending workshops. It is believed, therefore that these results are generalizable to the larger population of entrepreneurs.

Another limitation within this study is that the follow-up results have not yet been received. Without those results, it is not possible to know how many of the start-up participants continued to progress in their business formations. However, through the continuation of this study, this limitation will be corrected.

## Implications and Further Research

The results of this study could help small business development entities address the needs of entrepreneurs by focusing on those aspects found to be most essential in the business formation process. Perhaps the most interesting implications from this study deal with human capital and the future structure of small business development seminars at both the state and university level. The results indicate that human capital has the most pertinent implications for improving information disseminated to entrepreneurs.

Human capital is by far the most addressed source of capital within small business development workshops. The results of this study suggest that the funds spent on such instruction and training benefit entrepreneurs. They indicate that higher education and skill-training should continue to be promoted, since those with higher levels of education are more likely to participate in a start-up. Another way to increase the knowledge of the entrepreneur is through offering additional workshops, increased specialty programs, and/or counseling. One local SBDC office holds monthly entrepreneurial workshops in which local attorneys, accountants, marketing specialists, and bankers present information related to business start-up. Significant human capital

effects also indicate the importance of organizations, such as S.C.O.R.E., in which retired industry executives provide mentoring and counseling to entrepreneurs. The emphasis placed on business plan creation is justified, since attempting to write a business plan had a significant impact on an entrepreneur participating in a start-up. It is suggested that human capital development remain a central part of the services provided by small business development entities.

This study is an important step to continued research on this topic. There are many areas of study that could stem from this analysis, which will hopefully assist entrepreneurs and the entities that serve them in gaining further insight into the factors that significantly affect entrepreneurs in start-up. Over the next two years, this study will continue to monitor the progress of the entrepreneurs currently in the sample every two months, as well as work to recruit additional entrepreneurs to increase sample size. Through increasing the sample size, it is hoped that a comparison can be made between the rural entrepreneurs and their urban counterparts within the state. With such information, insight will be gained into the intricate process of entrepreneurship, and services may be designed to best meet the needs of entrepreneurs at every stage in the entrepreneurial process, no matter their location.

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Table 1: Frequencies and Percentages for Survey Variables of Interest

| Variable | Variable Description | No. of Observations | Frequency | % |
|---|---|---|---|---|
| PU | Participation at Purdue Workshop | 65 | 10 | 15.38% |
| SBDC | Participation at SBDC Workshop | 65 | 55 | 84.62% |
| LR1 | Lived in county <1 year | 65 | 2 | 3.08% |
| LR2 | Lived in county 2-5 years | 65 | 21 | 32.31% |
| LR3 | Lived in county 6-10 years | 65 | 15 | 23.08% |
| LR4 | Lived in county 10 or more years | 65 | 27 | 41.54% |
| AGE1 | Age category 18-25 | 65 | 7 | 10.77% |
| AGE2 | Age category 26-44 | 65 | 45 | 69.23% |
| AGE3 | Age category 45-64 | 65 | 12 | 18.46% |
| AGE4 | Age category 65 or older | 65 | 1 | 1.54% |
| FEM | Gender Female | 65 | 38 | 58.46% |
| MALE | Gender Male | 65 | 27 | 41.54% |
| AMERIND | American Indian or Alaskan native | 65 | 1 | 1.54% |
| ASIAN | Asian | 65 | 0 | 0.00% |
| HAWAII | Hawaiian or other Pacific islander | 65 | 0 | 0.00% |
| BLACK | Black or African American | 65 | 12 | 18.46% |
| WHITE | White | 65 | 51 | 78.46% |
| OTHER | Other race | 65 | 1 | 1.54% |
| SING | Single | 65 | 19 | 29.23% |
| MARR | Married | 65 | 46 | 70.77% |
| STARTY | Has been involved in the start-up of a new business within the past 6 mos. | 65 | 17 | 26.15% |
| STARTN | Has not been involved in the start-up of a new business within the past 6 mos. | 65 | 48 | 73.85% |
| CHAINY | Large retail chain located within community, such as a Wal-Mart, Target, or K-Mart | 65 | 58 | 89.23% |
| CHAINN | Large retail chain not located within community | 65 | 7 | 10.77% |
| GROW | Economy of community described as growing with many thriving new small businesses | 65 | 30 | 46.15% |
| STABL | Economy of community described as stable with many established small businesses | 65 | 30 | 46.15% |
| DETER | Economy of community described as deteriorating with the number of small businesses decreasing | 65 | 5 | 7.69% |
| JHIGH | Last grade of school completed was junior high level | 65 | 2 | 3.08% |
| HIGH | Last grade of school completed was high school level | 65 | 6 | 9.23% |
| COLLEG | Completed high school, some college | 65 | 23 | 35.38% |
| BACH | Completed bachelor's degree | 65 | 22 | 33.85% |
| GRAD | Completed graduate degree | 65 | 12 | 18.46% |
| PSTARTY | Has previous business start-up experience | 65 | 19 | 29.23% |
| PSTARTN | Does not have previous business start-up experience | 65 | 46 | 70.77% |
| BPLANY | Attempted to create business plan | 65 | 38 | 58.46% |
| BPLANN | Did not attempt to create business plan | 65 | 27 | 41.54% |
| NW1 | Approximate net worth <$50,000 | 65 | 22 | 33.85% |
| NW2 | Approximate net worth $50,001 to $75,000 | 65 | 6 | 9.23% |
| NW3 | Approximate net worth $75,001 to $100,000 | 65 | 11 | 16.92% |
| NW4 | Approximate net worth of >$100,001 | 65 | 26 | 40.00% |
| HHOY | Own place of residence | 65 | 54 | 83.08% |
| HHON | Does not own place of residence | 65 | 11 | 16.92% |
| SEPY | Parents or legal guardians are/were self-employed | 65 | 27 | 41.54% |
| SEPN | Parents or legal guardians are not/have not been self-employed | 65 | 38 | 58.46% |

Table 2: Binomial Logistic Regression Results

| Variable Names | Coefficient | P-Value |
|---|---|---|
| Constant | -7.954787** | 0.0387 |
| PU | 2.085471 | 0.1884 |
| LR2 | -0.388740 | 0.7006 |
| LR3 | -1.469368 | 0.2748 |
| FEM | 0.870361 | 0.3272 |
| CHANY | 4.613194* | 0.0848 |
| GROW | 0.122712 | 0.9607 |
| STABL | -1.142081 | 0.6056 |
| COLLEG | 3.729336 | 0.1288 |
| BACH | 1.886570 | 0.4227 |
| GRAD | 6.025602** | 0.0335 |
| PSTARTY | 1.506919 | 0.1290 |
| BPLANY | 2.052925** | 0.0470 |
| HHOY | -4.313461** | 0.0128 |
| NW 2 | 3.340585** | 0.0485 |
| NW 3 | 0.256700 | 0.8685 |
| NW 4 | 2.800462* | 0.0661 |
| SEPY | -1.593046 | 0.1469 |

| | |
|---|---|
| % Correctly Predicted | 89.23% |

*Indicates significance at the 10% level
**Indicates significance at the 5% level

| | |
|---|---|
| Log Likelihood Function | -22.87 |

Table 3: Probabilities for Explanatory Variables in the Model

| | Prob (Y=1)\|(x=1) | Prob (Y=1)\|(x=0) |
|---|---|---|
| PU | 0.439972431 | 0.088932126 |
| LR2 | 0.093718913 | 0.132353329 |
| LR3 | 0.041639011 | 0.158849013 |
| FEM | 0.161871606 | 0.074832062 |
| CHANGY | 0.181072608 | 0.002188633 |
| GROW | 0.125666894 | 0.112791531 |
| STABL | 0.067807371 | 0.185610468 |
| COLLEG | 0.599606306 | 0.034706172 |
| BACH | 0.319110238 | 0.066332909 |
| GRAD | 0.948205101 | 0.042357832 |
| PSTARTY | 0.281008076 | 0.079703183 |
| BPLANY | 0.239914765 | 0.038937679 |
| HHOY | 0.06088949 | 0.828862568 |
| NW2 | 0.736202884 | 0.089948446 |
| NW3 | 0.142748873 | 0.114118688 |
| NW4 | 0.419305163 | 0.042043949 |
| SEPY | 0.050343829 | 0.206824493 |