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# Hum an Capital and Its Effect on Entrepreneurship:

## A Key Componentor Much Ado about Nothing?

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Copyright 2005 by M aria I.M arshall and W hitney O.Peake. All rights reserved. Readers m ay m ake verbatim copies of this docum entformon-com m ercial purposes by any m eans, provided that this copyright notice appears on all such copies. Introduction

W ith the recent econom ic situation, a great deal of emphasis has been placed on the in portance of entrepreneurs in stimulating econom ic grow th, as well as on the essential elements of successful new venture creation. Sm all business development centers and universities throughout the United States routinely hold entrepreneurial w orkshops in an attempt to further educate entrepreneurs on those factors considered to be key components of successful new business ventures. W ithin the entrepreneurship literature, three main factors of capital have been recognized as essential elements of the entrepreneurial process: hum an, financial and social. In an entrepreneurial context, hum an capital consists of the skills, experience and education an entrepreneurbrings 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 hum an 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. M any studies have been conducted to determ ine the impact of hum an capital factors, although they have not directly tied results to implications they may hold for future small business assistance strategies.

This study is aim ed at identifying the relative in pact of hum an 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 hum an capital variables in participation in a business start-up relative to dem ographic, com munity dem ographic, financial capital, and social capital variables. R esults from this analysism ay provide information to entrepreneurs regarding key hum an capital com ponents of start-up success such as education, previous start-up experience, com pleting a business plan, etc., and m ay also assistsm all business development ententities in deciding the best allocation of their time and funds for entrepreneurial sem inars and w orkshops.

## Background

Entrepreneurs transition through several stages during the entrepreneurial process. R eynolds 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. D uring the progression of this stage, the first transition point, business conception, occurs. Conception serves as a signal forwhen the individual decides to start a business. G estation 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 Sm all B usiness D evelopm ent C enter. The transition point of gestation is known as firm birth, which leads to the final stage of the processinfancy. Infancy is known to be the riskiest stage of the entrepreneurial process and is estim ated to last for approxim ately two years. A t this stage it is in perative that the firm use the resources gained in the gestation period to its utmost advantage. U pon entering the infancy stage, there are three possible outcom es: firm grow th, survival, or term ination (R eynolds et al, 2002). The prelim inary portion of the study targets entrepreneurs approaching the firm birth transition point. W ithin 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, how every ere not captured.

#### Human Capital

M any studies have been conducted to determ ine the in pact of hum an capital factors on entrepreneurship. In particular, a m ajor focus has been placed on industry experience and general hum an capital in determ ining the success of entrepreneurs in firm foundation. The in portance of education as a form of general hum an capital has been dem onstrated in several studies. It has been found that higher education levels indicate an increased likelihood to participate in firm foundation and dem onstrate a significant in pactor the perform ance of the new venture (C coper et al; R obinson and Sexton; B ates; R eynolds 1997b; R eynolds et al, 2002,). A librough education as an indicator of hum an capital was show n to be relevant in start-up participation, previous work experience, was not show n to be a statistically significant factor in predicting participation in a start-up or in predicting start-up success (D avidsson and H onig, 2000).

Som e argum enthas also been m ade regarding the effectiveness of sm all business assistance program s in improving hum an capital. D avidsson and H onig (2003) indicated that social capital seem ed to play a m ore integral role in the success of the entrepreneur than did hum an capital. Chrism an, G atew ood, and D onlevy found in their study of efficiency and effectiveness of outsider assistance program s to entrepreneurs in both rural and non-rural states that assistance program s w ere probably capable of addressing and dealing w ith the needs of entrepreneurs. A linough previous research has identified the in portance of hum an capital, little is known regarding the impact of hum an 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 developm entworkshops hosted by either the Indiana Small Business D evelopm ent C enters or Purdue U niversity. O ne 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 firming birth and requested data regarding: personal dem ographics, community dem ographics, hum an capital, financial capital, and social capital. Table 1, show s some of the interesting variables obtained through the survey instrument. Percentages of participants involved in start-up with regards to specific variables are reported.

W ithin the study 26% of the entrepreneurs have participated in a business startup. A pproximately 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 orm ore years.

R espondents were asked to indicate their dem ographic categories. A pproximately 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 etal (2002) found in their study that an ong 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, sim ilar to the results of the aforem entioned study. Unlike the Reynolds et al (2002) study, how ever, 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 W al-M art, K -M art, or Target, within their respective community of residence. A pproximately 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 som e college, and 33% hold at least a bachelor's degree. The entrepreneurs who have participated in a start-up generally have som e 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 som e college, 24% have a bachelor's degree, and 29% have a graduate degree. Very similar to the data gathered for this study, R eynolds et al (2002) indicated that those who finish high school and entersom e 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. A pproximately 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, networth was used as a proxy for income. Forty percent of entrepreneuus indicated having a networth 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 low er or higher categories of networth. Of those indicating participation in a start-up, approximately 29% indicated that they have a networth of \$50,000 or less, 18% reported a networth of \$50,001 to \$75,000, 12% claimed a networth of \$75,001 to \$100,000, and 41% indicated a networth of more than \$100,000. Of the sixty-five study participants, 83% indicated that either they or some one within their household own their place of residence. Reynolds et al (2002) indicated that it is unclear whether household ow nership induces entrepreneurial activity or vice versa. In this study, 70% of those indicating startup own their place of residence.

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

M odeland Results

A binom ial logistic regression model was form ulated using the preliminary results to determ ine the relative impact of hum an capital on an entrepreneur's participation in a small business start-up. The binom ial logistic regression model applicable to this is shown in Equation 1.

start \* = 
$$x\beta + \varepsilon$$
  
 $\begin{cases} start = start * if start * > 0 \\ start = 0 otherwise \end{cases}$ 
(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.

START \* = 
$$\alpha + \beta_1 PU + \beta_2 LR1 + \beta_3 LR2 + \beta_4 LR3 + \beta_5 FEM + \beta_6 CHAINY + \beta_7 GROW + \beta_8 STABL + \beta_9 COLLEG + \beta_{10} BACH + \beta_{11} GRAD + \beta_{12} PSTARTY + \beta_{13} BPLANY + \beta_{14} HHOY + \beta_{15} NW 2 + \beta_{16} NW 3 + \beta_{17} NW 4 + \beta_{18} SEPY$$

$$(2)$$

Each entrepreneur surveyed either has participated in a start-up within the past six m onths (START =1) or has not (START = 0). E leven 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, M ALE = 0), presence of a m ajor retail chain in the com m unity, CHAIN (yes = 1, no = 0), econom ic state of the com m unity (GROW, STABL, DETER), education level (ELEM, JH IGH, HIGH, COLLEG, BACH, GRAD), previous start-up experience PSTART (yes = 1, no = 0), business plan attem ptBPLAN (yes = 1, no = 0), household ow nership HHO (yes = 1, no = 0), networth of household (NW 1, NW 2, NW 3, NW 4), and selfern ployed parents SEP (yes = 1, no = 0).

The binary logistic regression results for the start-up m odel can be found in Table 2. The regression analysis indicated that four variables were statistically significant at the 5% level: GRAD, BPLANY, HHOY, and NW 2. Two variables, CHAINY and NW 4, were statistically significant at the 10% level.

A great deal of personal dem ographic inform ation was requested in order to gain a greater insight into the effect of those factors on participation in a business start-up. Three personal dem ographics variables were selected as part of the model: location of study participation, length of residence in county, and gender. How ever, none of the dem ographic 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 determ ine 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. A lthough 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 exam ining the role of education, a positive relationship between increased education and entrepreneurship was found to exist. In the study conducted by R eynolds 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 hum an capital portion of the survey instrum ent. 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, how ever, previous start-up experience was not statistically significant.

A great deal of emphasis is placed on the importance of business plan creation in m any workshops designed for entrepreneurs. The business plan attem pt variable, BPLAN, w as tested to determ ine the importance of a business plan attempt in actually participating in a sm all 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 ow nership HHOY indicates access to equity capital, which serves as a major source of funding for entrepreneurial activities. Household ow nership was negative and statistically significant at the 5% level. Gartner et al (2002), how ever, determined that it is was unclear whether home ow nership causes entrepreneurial activity or entrepreneurial activity causes home ow nership. The results of this study indicate that household ow nership negatively affects participation in a start-up.

N etw orth w as used as a proxy for income. In the PSED study, G artneretal (2002) found that those with higher household income were more likely to become entrepreneurs. It was expected that having a networth of \$50,000 orm ore 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.

D avidsson and H onig (2003) found a strong correlation between being an entrepreneur and having parents w ho are or were self-en ployed. Therefore, it was expected that having parents w ho are or w ho had been self en ployed would positively effect participation in a business start-up. The results, how ever, indicate that having selfen ployed parents is not a statistically significant factor is business start-up.

#### Probabilities

Probabilities were calculated to dem onstrate the combined affect of the variables on participation in a start-up and are shown in Table 3.Hum an capital variables are included and excluded from the calculations to determ ine if they have any substantial affecton the probability of participating in a business start-up. The probabilities for the variables within the logitm odel were calculated using Equation 3.

$$\hat{\mathbf{P}} = \mathbf{F} \left( \mathbf{X}_{i} \hat{\boldsymbol{\beta}} \right) = \frac{\exp\left( \mathbf{X}_{i} \boldsymbol{\beta} \right)}{1 + \exp\left( \mathbf{X}_{i} \hat{\boldsymbol{\beta}} \right)} \tag{3}$$

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 networth 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 fem ale 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 networth 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. Allelse remaining the same, if the major retail chain factor were removed, the probability would decrease to a mere 15%.

To dem onstrate the importance of hum an 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 startup, has attempted to write a business plan, owns a home, has a networth 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 attempthas 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. Sim ply factoring in an attempt to write a business plan for the latterm an increases his probability of participating in a start-up to 82.8%. These results indicate that hum an capital factors within the model have a major effection whether or not the individual participates in a business start-up.

#### D iscussion

A libough 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 particularm on ent 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 problem sarising in entrepreneurship are common am ong all entrepreneurs, how ever, not only to those

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

A nother 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. How ever, through the continuation of this study, this limitation will be corrected.

### Im plications and Further Research

The results of this study could help an all business developm ententities address the needs of entrepreneurs by focusing on those aspects found to be most essential in the business form ation process. Perhaps the most interesting in plications from this study dealwith hum an capital and the future structure of an all business developm enterminans at both the state and university level. The results indicate that hum an capital has the most pertinent in plications for in proving inform ation dissem inated to entrepreneurs.

Hum an capital is by far the most addressed source of capital within small business developm entworkshops. 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. A notherway to increase the know ledge of the entrepreneur is through offering additional workshops, increased specialty program s, and/or counseling. One local SBD C office holds monthly entrepreneurial workshops in which local attorneys, accountants, marketing specialists, and bankers present inform ation related to business start-up. Significant hum an capital effects also indicate the in portance 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 in pacton an entrepreneur participating in a start-up. It is suggested that hum an capital development remain a central part of the services provided by small business development entities.

This study is an in portant step to continued research on this topic. There are m any 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. O ver the next two years, this study will continue to monitor the progress of the entrepreneurs currently in the sam ple every two months, as well as work to recruit additional entrepreneurs to increase sam ple size. Through increasing the sam ple 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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Variable	Variable Description	No.of0 bservations	Frequency	8
PU	Participation at Purdue W orkshop	65	10	15.38%
SBDC	Participation at SBDC Workshop	65	55	84.62%
LR1	Lived n county <1 year	65	2	3.08%
LR 2	Lived in county 2-5 years	65	21	32.31%
LR 3	Lived in county 6-10 years	65	15	23.08%
LR 4	Lived in county 10 orm one 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 orolder	65	1	1.54%
FEM	GenderFem ale	65	38	58.46%
MALE	GenderM ale	65	27	41.54%
AMERIND	Am erican Indian or Alaskan native	65	1	1.54%
ASIAN	Asian	65	0	800.0
НАМ АП	Hawaian ororotherPacific islander	65	0	800.0
BLACK	Black or African American	65	12	18.46%
WHITE	W hite	65	51	78.46%
OTHER	O therrace	65	1	1.54%
SING	Single	65	19	29.23%
MARR	Mamed	65	46	70.77%
STARTY	Has been involved in the start-up of a new business within the past $6 \text{ m}$ os.	65	17	26.15%
STARTN	Has notbeen involved in the start-up of a new business within the past6 m os.	65	48	73.85%
CHANY	Large retailchain bcated within community, such as a W alM art, Target, or K-M art	65	58	89.23%
CHAINN	Large retailchain not boated within community	65	7	10.77%
GROW	Econom y of com m unity described as growing with m any thriving new sm allousinesses	65	30	46.15%
STABL	Economy of community described as stable with many established smallbusinesses	65	30	46.15%
DETER	E conom y of com m unity described as deteriorating with the num ber of sm all businesses decreasing	65	5	7.69%
JH IG H	Lastgrade of school com pleted was junior high level	65	2	3.08%
Н IG Н	Lastgrade of schoolcom pleted was high schoollevel	65	6	9.23%
COLLEG	Com pleted high school, som e college	65	23	35.38%
BACH	Completed bachebrs degree	65	22	33.85%
GRAD	C om pleted graduate degree	65	12	18.46%
PSTARTY	Has previous business start-up experience	65	19	29.23%
PSTARTN	Does nothave previous business start-up experience	65	46	70.77%
BPLANY	Attem pted to create business plan	65	38	58.46%
BPLANN	D il notattem pt to create business plan	65	27	41.54%
NW 1	Approxim ate networth <\$50,000	65	22	33.85%
NW 2	Approxim ate networth \$50,001 to \$75,000	65	6	9.23%
NW 3	Approxin ate networth \$75,001 to \$100,000	65	11	16.92%
NW 4	Approxim ate networth of>\$100,001	65	26	40.00%
нно ч	Own place of residence	65	54	83.08%
HHON	Does notown place of residence	65	11	16.92%
SEPY	Parents or legal guardians are /w ere selfem pbyed	65	27	41.54%
SEPN	Parents or legal guardians are not/have not been selfem pbyed	65	38	58.46%

# Table 1: Frequencies and Percentages for Survey V ariables of Interest

Varable Nam es	Coefficient	P-Value
Constant	-7.954787**	0.0387
PU	2.085471	0.1884
LR 2	-0.388740	0.7006
LR 3	-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
ННОҮ	-4.313461**	0.0128
NW 2	3.340585**	0.0485
NW 3	0256700	0.8685
NW 4	2.800462*	0.0661
SEPY	-1.593046	0.1469

Table 2: B inom ial Logistic Regression Results

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*Indicates significance at the 10%	level
**Indicates significance at the 5%	level
Log Likelihood Function	-22.87

% Connectly Predicted 8923%

	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
СНАЛҮ	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	0281008076	0.079703183
BPLANY	0 239914765	0.038937679
ННОҮ	0.06088949	0.828862568
NW 2	0.736202884	0.089948446
NW 3	0.142748873	0.114118688
NW 4	0.419305163	0.042043949
SEPY	0.050343829	0 206824493

Table 3: Probabilities for Explanatory V ariables in the M odel