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The Effect of Culture on Entrepreneurial Networks

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The Effect of Culture on Entrepreneurial Networks

Abstract

Networking is an important aspect of business. For entrepreneurs in particular, the strength of a network could offer important resources and opportunities through both close and distant contacts, which are known in network theory as strong and weak ties. This thesis analyzes the impact of entrepreneurs' network tie strength on firm performance by analyzing networks in different countries through a correlational meta-analysis. The moderating factor of culture was analyzed to understand the impact of how individualistic and collectivist cultures affect network tie strength. Through analyzing 23 different primary studies (N=4041) from various individualistic and collectivist countries, the meta-analysis determined that culture does not have a statistically significant moderating impact on network strength on firm performance. I discuss the implications of these findings for entrepreneurs and business networks.

Keywords

entrepreneurship, social networks, culture

Disciplines

Entrepreneurial and Small Business Operations

THE EFFECT OF CULTURE ON ENTREPRENEURIAL NETWORKS

By

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ABSTRACT

Networking is an important aspect of business. For entrepreneurs in particular, the strength of a network could offer important resources and opportunities through both close and distant contacts, which are known in network theory as strong and weak ties. This thesis analyzes the impact of entrepreneurs' network tie strength on firm performance by analyzing networks in different countries through a correlational meta-analysis. The moderating factor of culture was analyzed to understand the impact of how individualistic and collectivist cultures affect network tie strength. Through analyzing 23 different primary studies (N=4041) from various individualistic and collectivist countries, the meta-analysis determined that culture does not have a statistically significant moderating impact on network strength on firm performance. I discuss the implications of these findings for entrepreneurs and business networks.

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INTRODUCTION

Social capital, or the resources embedded in entrepreneurs' personal networks, is critical for the performance of small firms. With limited resources and opportunities, entrepreneurs must work at great lengths to achieve what larger corporations can easily obtain through business connections (Jenssen 2001; Bhagavatula et al 2010). Besides capital markets and venture capitalists that provide the financial foundations for entrepreneurs to build on, the key factors of collaboration and idea sharing come through support channels of network systems. To understand these social networks, social networks has been increasingly applied within the realm of entrepreneurship, consistently linking human capital attributes to entrepreneurial success (Unger et al 2011).

To try to piece together the effect of social network strength on startup performance of different cultures, this thesis adds to the growing literature on social networks, particularly for different business settings. As the research on entrepreneurial networks grows with the increase in startups, there has not been consensus on how these networks can optimize tie strength, especially in the context of startups. The growing number of entrepreneurs and startups point to the importance of creating an environment to support the success of these entrepreneurs. According to the Startup Genome Project, which analyzed over 3200 high growth technology startups, the alarming 90% failure rate of startups highlights the need for better facilitation in these startup ecosystems. Anything that can positively impact the likelihood of success for these entrepreneurs is needed, evident in the sparse number of success stories. Thus it seems imperative that entrepreneurs invest in any connections to resources such as these networks; however, current literature points to the misfit in motivation for networking for entrepreneurs within different countries since there are overall both positive and negative externalities from

networking. For example, although sharing knowledge between units can be beneficial for the recipient and the larger organization, it is costly for the source, at least in terms of the time and effort the source must allocate to the transfer process (Tortoriello et al 2011). Such externalities present a question of what network structures might create beneficial relationships and this research looks to find these insights to contribute to the current literature for different theories of entrepreneurial networks.

The focus of this research is to examine how the social networks of entrepreneurs can affect the performance of the startups these entrepreneurs have built. There has been increasing research particularly within the social capital field in network theory to understand the structures of networks that might contribute to the success of startups. Network information flow often runs inward within the network and creates perhaps strong but also stagnant currents of information. People tend to share information with people they are in frequent contact with, who are hereafter called "strong ties" within networks (e.g., family and close friends). However, information sharing also happens with "weak ties", who are people of acquaintance or strangers especially because the information is often new circles (Burt 1995). However, weak ties are not necessarily less important for they can be useful to create power by offering opportunities of individuals to offer information in the holes of networks.

The relationship between the strength of networks to firm performance will be moderated by the variable of culture. This research will examine the lens of culture through using the degree of individualism and collectivism to see the effects on firm performance. Collectivism is the degree to which people in a society are integrated into groups while individualism is the integration of only a few individuals (Hofstede 2011). Individualist cultures have ties between individuals that are loose: everyone is expected to look after him/herself and his/her immediate

family. On the collectivist side, cultures in which people from birth onwards are integrated into strong, cohesive in-groups, often extended families (with uncles, aunts and grandparents) that continue protecting them in exchange for unquestioning loyalty, and oppose other ingroups. Individualistic countries are typically Western countries and developed countries, while collectivism prevails in less developed and Eastern countries. By understanding the way individualistic and collectivistic entrepreneurs consider their tie strengths, individualistic and collectivist entrepreneurs might invest in their networks in different network structures to facilitate better information sharing as well as better human capital practices so that they might be more successful in managing their people. This would allow them to retain critical human capital and use more time to focus on the product or service of the business issue at hand. Thus, the research will build on previous literature on social networks by exploring how cultural aspects affect organization human capital strategies.

This paper will first provide an overview of the current literature on social capital networks. Then the hypothesis will be presented, followed by the data and research. The findings are described in the section afterward and the paper ends with the discussion of the findings.

LITERATURE REVIEW

Networks

Networks possess tie properties and structural properties. Ties are defined by the type of content they carry, such as goods, information, or moral support, and by their strength. Tie strength depends on various factors, including time and reciprocity, and tie strength affects how a network operates (Snow et al 2010). Strong ties provide support among actors and enable the transfer of rich information and tacit knowledge. Weak ties, on the other hand, are sources of diverse resources and novel information (Granovetter 1973). To succeed, entrepreneurs rely

heavily on personal networks, especially in the nascent bootstrapped stages of a company's beginnings, and so both strong and weak ties all become important. Since a lack of social capital is an especially relevant area of study for entrepreneurship, it is an aspect of liabilities of newness that characterize entrepreneurial ventures (Morse, Fowler, & Lawrence 2007). There are two leading reasonings about what types of social capital or social networks in terms of structure are beneficial to individuals, groups and organizations.

On the one hand, dense networks allow actors to achieve their goals effectively because of cooperative behavior of members, high trust embedded in relationships and informal social mechanisms that control opportunistic behaviors (Coleman 1988). Other research has found that network centrality was positively and significantly related to business performance, which lends support to the social network theory, indicating that the more central the entrepreneur is in the network, the more it will affect his or her business performance. These networks contain ties called strong ties, which are close friends, family, and other ties with others that would allow for the opportunities that are important for startups to take advantage of.

On the other hand, sparse and non-redundant networks rich in structural holes facilitate actors' access to new information, opportunities and resources promoting success of instrumental actions. Structural holes occur when there is a lack of connection between two nodes that is bridged by an actor called a broker (Burt 1992). If the entrepreneur could act as a broker the entrepreneur benefits from new information. Often brokering happens by connecting weak ties which are more effective for facilitating the diffusion of heterogeneous information (Granovetter 1973). Such motivations incentivize brokers of networks to not share information and not allow information sharing since this gives them a competitive advantage.

Certain industry networks might prove to have powerful effects for such entrepreneurs. Networks of different countries show that a majority of male entrepreneurs start a company in the same or closely related industry as their fathers' industry of employment and these entrepreneurs tend to outperform those who enter industries their fathers did not work in (Hvide 2017). Additionally, having a lack of technological knowledge often affects networking behavior as new venture founders who do not have technological or startup experience tend to form short-term orientation ties, often for operational benefits (Zheng et al 2019). Lack of industry expertise often drives entrepreneurs the need to increase in social capital through the use of networks.

Social Capital from Networks

Social capital theory is the ability of actors to extract benefits from their social structures, networks and memberships (Lin et al 1981). Social networks have shown effects on outcomes of instrumental actions, give resources to people based on their position of the network tie, and is affected by the strength of ties when determining the nature of resources obtained (Lin 2001). Although there are many factors contributing to social capital, social capital has been broadly defined in this paper as a link between definition and operationalization to explain any aspect of the network processes. In this paper, networks are operationally used broadly to examine the effects of networks on firm performance. Social networks provided by extended family, community-based, or organizational relationships create opportunities achieved through different experiences, education, and financial capital (Coleman 1988). These networks can be particularly useful to bridge external networks in order to provide resources (Adler and Kwon 2002). Additionally, there has been increasing research to prove that entrepreneurship is embedded in network relationships that allow knowledge and resources for entrepreneurs who are better connected (Aldrich and Zimmer 1986).

Culture

There is emerging evidence that social capital might operate differently in different institutional environments (Batjargal 2010). A Greece-based study argued that cultural differences substantially change the nature of entrepreneurial networks (Dodd and Patra 2002). Culture is defined as ''the collective programming of the mind, which distinguishes the members of one group or category of people from those of another'' (Hofstede 2011). Generally, cross-cultural comparisons are made on the five dimensions of individualism-collectivism, power distance, uncertainty avoidance, masculinity-femininity, and long-term versus short-term orientation. Among these dimensions, individualism and collectivism are most frequently used to investigate the factors influencing collective action (Hofstede 2011). Individualism measures the degree to which people in a society are concerned for their own and their immediate family members' well being while collectivism measures the degree to which people in a society are concerned for those outside their immediatey family and extended to relatives and even others in the community (Hofstede 2011). Often, people in individualistic countries focus more on themselves instead of those around then. To disentangle the factors that affect firm performance based on country, we will examine whether the individualism of a country affects the success of startups. Thus, to resolve conflicting findings, research is needed to reveal how small firms operating in different environmental contexts might benefit from distinct forms of social capital.

HYPOTHESIS AND REASONING

Hypothesis

The research hypotheses explore how network strength ties are moderated by individualism and collectivism degrees in countries.

Hypothesis 1: Strong ties of entrepreneurs who base their companies in individualistic

countries networks will be more positively related to firm performance.

Hypothesis 2: Strong ties of entrepreneurs who base their companies in individualistic

countries networks will be more negatively related to firm performance.

Hypothesis Reasoning

Organizations have developed in a way to embody the characteristics of the countries

they operate in. For instance, research has found that organizational cultures of American

companies were high in individualism, whereas Mainland Chinese firms were more group-

oriented. For example, local Chinese firms are high in both group and developmental cultures,

and these two cultures are significantly related to organizational commitment (Lau 1999). Such

strong organizational cultures might dictate how network ties operate and differ depending on

context. Strong relationships between employees' satisfaction and organizational commitment

were confirmed in the aforementioned studies, further highlighting that when networks are

utilized in company settings, assimilating into organizational and country cultural characteristics

is important for employees. Thus entrepreneurs might use their networks in a way that might

focus on cultural congruence. Network congruence with cultural congruence could prove to be

an important factor for firm performance, as evidenced in how organizational cultures dictate

employee relations. Thus individualistic countries' entrepreneurs might focus on their strong ties,

in relation with their high self-reliant characteristics, while collectivist countries might focus

more on the weak ties, in aligning with group culture, further supporting Hypothesis 1. Past

research and literature indicates the high likelihood of the postulation of Hypothesis 1.

Although Hypothesis 1 might have stronger precedent cases, another hypothesis might

provide another reasoning. There is also evidence of individualism that those who have dense

networks and are brokers between different networks are better compensated, evaluated better, and receive more promotions than non-brokers in a large American electronics company (Burt, 2002). In this instance, brokerage, which requires creating weak ties among individuals was proven to be connected with performance even within an individualistic setting, leading to Hypothesis 2 as strong ties actually are more negative to firm performance whereas the real benefits come from weak ties.

Another possible alternative for Hypothesis 2 is that some companies operate in opposite ways to the country they operate in order to be unique. To be competitive, some entrepreneurs might operate by focusing on their strong ties to gain the most rich and tacit information (Granovetter 1973), instead of relying on weak ties. This might prove to be true, considering that entrepreneurs' firms are quite different than a developed firm's resources, so entrepreneurs might be more willing to counter the country's characteristics of group ties and focus more on a smaller dense network and use these opportunities.

DATA AND RESEARCH METHODOLOGY

Data

The studies were analyzed through a meta-analysis, which quantitatively combines the evidence from different studies in a mathematically appropriate way. Meta-analysis may provide a precise and robust summary estimate after a systematic and rigorous integration of the available evidence (Tatsioni and Ioannidis 2017). The meta-analysis included 23 studies of various countries, displayed in Table 1. These studies were selected by building upon the work on social capital of entrepreneurs (Stam et al 2013). The articles were drawn from 59 studies that reported a correlation between social capital and firm performance as well as using studies that used independent samples. To ensure entrepreneurship and new firms, entrepreneurs' firms

needed to have existed on average for less than 6 years. Of the 59 studies, the 23 studies shown

in Table 1 were chosen based on the following criteria. First, the studies needed to define

network tie strength as the independent variable. Second, the studies were focused on firm

performance that was profit and sales growth rather than nonfinancial performance. Financial

and nonfinancial performance measures are should be distinguished to disentangle impact of

each measure, as the former focuses on economic goals while the latter emphasizes more of

operational effectiveness (Venkatraman and Ramanujam 1986). Financial business performance

indicates the achievement of the economic goals of the firm, whereas nonfinancial business

performance focuses on the firm's broader operational effectiveness. Across the 23 studies, the

total sample size was 4041 entrepreneurial networks. After reading through each study, the data

was coded to find the weighted correlation.

Table 1
Overview of the Studies

Study Name	Sample Size	Correlation
Zou et al	252	0.154
Yang et al	130	0.606
Li and Atuahene-Gima	300	0.19
Lee and Tsang	168	0.28
Butler et al	100	0.097
Bradley et al	201	-0.09
Lau and Bruton	134	0.445
Bratkovic et al	103	0.27
Batjargal	75	0.78
Prajapati and Biswas	133	0.286
Bhagavatula et al	107	-0.14
Hormiga et al.	130	0.179
Cantner and Stuetzer	182	0.09
Jensen and Greve	100	0.27
Davidsson and Honig	380	0.058
Grandi and Grimaldi	40	0.5
Scholten	160	0.1
Hanlon	50	0.35
West and Noel	83	0.393
Sawyerr et al.	153	0.12
Patel and Terjesen	452	0.22
Ndofor and Priem	146	0.064
Liao and Welsch	462	0.013

Methodology

Coding

  The independent variable was the tie strength of the network structure, while the dependent variable, firm performance, was primarily categorized for financial performance, particularly for sales and revenue measures. The independent variable was coded by tie strength, which is defined as the "combination of the amount of time, the emotional intensity, the intimacy (mutual confiding) and reciprocal services which characterize the tie" (Granovetter 1973). The determinant for financial performance was measured by sales growth and revenue. The correlation between the two variables was measured through analyzing the 23 studies to understand how the tie strength impacted financial performance.

  The moderating factor was the degree of individualism and collectivism the country has. The countries' individualistic and collectivist values were determined by Hofstede Insights, a tool that measures countries' characteristics (Hofstede 2011). The countries' Hofstede scale measures individualistic countries with those of scores higher than 50 while collectivistic countries have scores lower than 50. Countries range from China (20) as one of the more collectivist cultures while the United States is one of the highest individualist cultures (91) in the world.

  After coding the data of individual and collectivist countries, the data was analyzed to understand the effect on firm financial performance. The correlation coefficient and sample size for each independent sample is shown in Table 1. It is interesting to note that the correlation chosen for the studies were not all positive, reinforcing the importance of using a meta-analysis to determine whether the overall impact is positive or negative.

Meta-Analysis

This research utilized the meta-analysis methodology to evaluate the data. A meta-analysis enables researchers to synthesize cumulative research findings, correct these findings for sampling and measurement error, and assess whether hypothesized relationships have been successfully replicated (Combs et al 2011). The meta-analysis used the correlation by using the sample size, correlation and moderator to create a weighted correlation. The correlational meta-analysis was used by taking the correlation of each of the 23 independent samples and the online tool Meta-Mar was used to analyze the overall effect size.

Statistical models There are two popular statistical models for meta-analysis, the fixed-effect model and the random-effects model (Borenstein et al 2010). Under the fixed-effect model, one effect size is assumed for the analysis and that all the differences in observed effects are due to sampling error (Cooper et al 2019). This would be used if working with one population. However, working with a universe of population of startup companies, which differ from each other in a myriad of ways, the random-effects model may be more appropriate. The random-effects model allows the idea that the true effect size might differ from study to study. For instance, the effect size might differ in studies due to different industries. Thus, the random-effects model will be focused on for this analysis.

RESULTS

A summary of the results are in Table 2, which displays the results for the relationship between entrepreneurs' network ties and the entrepreneur's firm performance. The overall relationship between the network ties and entrepreneur's firm performance was $R^2 = 0.027$. This effect was statistically significant. It shows that 2.7% of entrepreneur's firm performance can be explained by network tie strength.

Table 2
Results of OLS on network tie strength of different cultures

Variable	Result
R-squared	0.027
Adj. R-squared	-0.02
F-statistic	0.5746
Prob (F-statistic)	0.457
Log-Likelihood	3.3644
AIC	-2.729
BIC	-0.4579

Table 3
Results for Constant and Moderator

	Coefficient	Std Error	t	P>|t|	[0.025	0.975]
Constant	0.2948	0.1	2.957	0.008	0.087	0.502
Moderator	-0.0012	0.002	-0.758	0.457	-0.005	0.002

As shown in Table 3, the effect of the moderator (culture) was not significant (ρ= 0.0012, *S.E.* = .002, *t* =-0.758, *p* = 0.457). This indicates that relationship of entrepreneur's network to firm performance is not dependent upon culture. Thus, neither Hypothesis 1 nor 2 were supported. This suggests robust effects across cultures.

Table 4
Fixed Effect and Random Effect Model Results

	Fisher Z	r	SE	95% CI	Z Score	p value	Heterogeneity (I^2)
Fixed Effect Model	0.18	0.18	0.02	[0.15,0.21]	23.015	0	98.60%
Random Effect Model	0.25	0.24	0.14	[-0.03,0.51]	3.655	0.000257	98.6%, T^2 = 0.426

Table 4 shows the random effect model which is used for this population with a strong heterogeneity (I^2) of 98.6% which suggests that the studies in this meta-analysis cannot be considered to be studies of the same population (Borenstein 2009). Both T^2 and *Tau* are measures of the dispersion of true effect sizes between studies in terms of the scale of the effect size, or in other words T^2 (T^2 = 0.426) is an estimate of the variance of the true effect sizes. *Tau* is an estimate of the standard deviation of the distribution of true effect sizes, under the assumption that these true effect sizes are normally distributed. *Tau* is used for computing the prediction

interval, and is used to assign weights to the studies in the meta-analysis under the random-effects model. The prediction interval is shown on the forest plot (Figure 4). Despite its name as "prediction" interval, the prediction interval should be interpreted as a description of the range of observed effect sizes rather than as a prediction of the range of effect sizes that would be observed in future studies (Borenstein 2009).

DISCUSSION AND CONCLUSION

The results reveal that there is a positive and significant relationship between network tie strength and financial performance. This research aimed to use the meta-analysis to synthesize research findings and identified new moderators. The study hypothesized that cultural congruence would emerge, given that the individualistic countries would reward entrepreneurs with strong ties and act in accordance with more tighter connections while collectivist countries might reward weak ties. However, the results show that culture does not have a significant impact on firm performance. This finding is important because it reveals the impact that networking could have for entrepreneurs. The tie strength of networks proves to have value ($R^2 = 0.027$) and could be particularly useful for any entrepreneur within any culture. Entrepreneurs can enlarge their networks to get crucial information and other resources from others who are well connected. However, interestingly, the level of individualism and collectivism, did not have statistical significance and does not affect the relationship between network ties and performance for entrepreneurs. The analysis has several managerial implications.

First, the positive relationship between network strength and firm performance support the network analysis literature that strong ties are an important aspect to consider in business networks. Practically this study has implications for entrepreneurs and the employees of these entrepreneurial organizations. Although this analysis focused on the networks of the

entrepreneurs themselves, given the small nature of startups, there are opportunities for both entrepreneurs and the small number of employees to invest in strong ties to enhance financial performance. This adds to the growing literature on entrepreneurship networks and how resources can be accessed more easily when entrepreneurs' personal networks lack structural holes and are densely connected (Hite and Hesterly 2001). With more resources and strong networks, the probability of success can increase.

Second, the null effect of individualism and collectivism presents an interesting perspective on culture in the midst of current business situations tackling more diverse workplaces. In more individualistic countries, one might expect that strong ties would prove to be more useful than weak ties. However the null effect of the moderator shows that strong ties are not necessarily linked to one type of tie strength. The business implications of this discovery might suggest that investing in both strong and weak ties is still an important part of network structures in general. Recent research indeed suggests that optimal network configurations often combine bonding and bridging networks through brokerage (Gulati et al 2011). Thus both bonding through strong and bridging through weak ties might be important for entrepreneurs to do well.

Limitations and Future Research

The first limitation might involve accuracy. The meta-analysis may not be the complete story of firm performance given survivor bias among startups. Namely, the sampled studies of entrepreneurs come from a selection of studies in which these entrepreneurs have succeeded. The history of entrepreneurship shows that the significant number of entrepreneurs who fail in their endeavors is high. Thus, the pool of studies utilized in this analysis might not provide the whole picture of how network strength might affect firm performance.

Additionally, more moderators need to be identified to allow for greater accuracy. One moderator would be accounting for entrepreneurial experience. For instance, research has shown that the optimal configuration of social capital changes over time (Stam et al 2014). Those who grow in experience with startups and technological experience also tend to form relationships that are guided by long-term orientation ties that focus on symbolic benefits rather than just operational, which thus show the changes in entrepreneurs in their ties (Zheng et al 2010). It would be interesting to continue to explore how experience could really change as entrepreneurs become more like bigger corporations in which networks can become quite expansive but also stronger as well. Similarly, future research in the other dimensions of Hofstede's measure of culture as other moderators to account for and explore. Particularly, the PDI (Power Dimension Index) might be another proxy to measure how power might further influence how tie structures are formed within companies (Hofstede 2011).

In terms of future research of methodology, the actual conducting of meta-analysis might improve so that future research methods are more efficient in acquiring past research. In the course of searching for datum points, the idea of using simulated data points was explored. This novel approach involves using a meta-analysis through the simulation of data points. By including more factors, particularly accurate data points through simulation, the analysis rendered could create more accurate results. With the growth of data science, using the simulation of data can improve the accuracy of the aggregation of data, including approaches such as the Markov chain Monte Carlo (Yamaguchi et al 2014). Another research method is examining the research in causality more on a multivariable level of analysis stretching across different fields, which has been largely through the work of Judea Pearl. Some of his analysis has already pointed to the potential of large analysis of causality by integrating research on cause and

effect inferences from cognitive science, econometrics, epidemiology, philosophy, and statistics (Pearl, 2000). To build on the work of Judea Pearl and other progressions in data science, the future motivation to understand how different larger fields can affect other variables could be the importance of future research and the way meta-analysis are conducted.

Future research can also look to use other measures for performance. This analysis used financial performance for revenue and sales growth, but there are other conceptualizations and measures of performance, especially in different industries. Nonfinancial performance such as operational effectiveness or competitive capabilities could be other factors to analyze to understand the impact of networks on entrepreneurial performance. Since entrepreneurs know that the first few years of operating are often at a loss, looking at other nonfinancial performance metrics might provide a different perspective. Although the level of individualism and collectivism might not have affected financial performance, these levels might enhance non-financial performance metrics, such as higher number of novel ideas or organizational effectiveness, as people who differ in culture learn to adapt and learn from their coworkers. Measuring whether new ideas flowed from more culturally diverse companies should be a future topic to pursue for future researchers.

Although network structure has been studied more with the work of social network theory and the strength in ties, there is still much more exploration of network tie strength needed in the field of entrepreneurship. The empirical results of this research proffer to close this gap in knowledge via an estimate of the relationship between networks and entrepreneurial success. This research showed that 2.7% shows that the effect of tie strength, particularly strong ties on firm performance. Through the analysis of the studies, the relationship between networks and positive firm performance is confirmed, yet the null effects of Hypothesis 1 and Hypothesis

2 show the interesting result that culture does not moderate the relationship of entrepreneurial networks on performance. All in all, this research serves to support the accumulating literature on entrepreneurs who seek to grow their social networks. As the business networks of entrepreneurs grow and the networks begin to expand across cultures and business sectors, we need more research to create efficient social structures conducive to entrepreneurship.

APPENDIX

Figure 1
Extension of Table 1 of Meta-Mar

	study name	N	r	moderator	SE	r_lower	r_upper	Fisher z	Weight(%)_fixed	Weight(%)_random
1	Zou et al	252	0.154	20	0.063372	0.029790	0.278210	0.155235	6.268882	4.393143
2	Yang et al	130	0.606	20	0.088736	0.432078	0.779922	0.702575	3.197382	4.354080
3	Li and Atuahene-Gima	300	0.190	20	0.058026	0.076269	0.303731	0.192337	7.477341	4.399784
4	Lee and Tsang	168	0.280	20	0.077850	0.127414	0.432586	0.287682	4.154079	4.372355
5	Butler et al	100	0.097	20	0.101535	-0.102008	0.296008	0.097306	2.442095	4.329779
6	Bradley et al	201	-0.090	25	0.071067	-0.229291	0.049291	-0.090244	4.984894	4.382600
7	Lau and Bruton	134	0.445	20	0.087370	0.273754	0.616246	0.478448	3.298087	4.356495
8	Bratkovic et al	103	0.270	27	0.100000	0.074000	0.466000	0.276864	2.517623	4.332850
9	Batjargal	75	0.780	39	0.117851	0.549012	1.010988	1.045371	1.812689	4.294546
10	Prajapati and Biswas	133	0.286	48	0.087706	0.114097	0.457903	0.294204	3.272910	4.355905
11	Bhagavatula et al	107	-0.140	48	0.098058	-0.332194	0.052194	-0.140926	2.618328	4.336676
12	Hormiga et al.	130	0.179	51	0.088736	0.005078	0.352922	0.180949	3.197382	4.354080
13	Cantner and Stuetzer	182	0.090	67	0.074744	-0.056497	0.236497	0.090244	4.506546	4.377157
14	Jensen and Greve	100	0.270	69	0.101535	0.070992	0.469008	0.276864	2.442095	4.329779
15	Davidsson and Honig	380	0.058	71	0.051503	-0.042945	0.158945	0.058065	9.491440	4.407117
16	Grandi and Grimaldi	40	0.500	76	0.164399	0.177778	0.822222	0.549306	0.931521	4.170004
17	Scholten	160	0.100	80	0.079809	-0.056425	0.256425	0.100335	3.952669	4.369232
18	Hanlon	50	0.350	80	0.145865	0.064105	0.635895	0.365444	1.183283	4.223614
19	West and Noel	83	0.393	91	0.111803	0.173865	0.612135	0.415343	2.014099	4.308148
20	Sawyerr et al.	153	0.120	91	0.081650	-0.040033	0.280033	0.120581	3.776435	4.366230
21	Patel and Terjesen	452	0.220	91	0.047193	0.127502	0.312498	0.223656	11.304129	4.411494
22	Ndofor and Priem	146	0.064	91	0.083624	-0.099903	0.227903	0.064088	3.600201	4.362939
23	Liao and Welsch	462	0.013	91	0.046676	-0.078485	0.104485	0.013001	11.555891	4.411994

Figure 2

Results from Meta-Marr Correlation Analysis (Table 2-3)

Dep. Variable:	r	R-squared:	0.027
Model:	OLS	Adj. R-squared:	-0.020
Method:	Least Squares	F-statistic:	0.5746
Date:	Mon, 20 Apr 2020	Prob (F-statistic):	0.457
Time:	16:24:18	Log-Likelihood:	3.3644
No. Observations:	23	AIC:	-2.729
Df Residuals:	21	BIC:	-0.4579
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	0.2948	0.100	2.957	0.008	0.087	0.502
Moderator	-0.0012	0.002	-0.758	0.457	-0.005	0.002

Omnibus:	2.409	Durbin-Watson:	2.158
Prob(Omnibus):	0.300	Jarque-Bera (JB):	1.258
Skew:	0.557	Prob(JB):	0.533
Kurtosis:	3.269	Cond. No.	134.

Figure 3

Fixed Effect and Random Effect Model Original Results

	Fisher Z	r	SE	95%CI	z score	p value	Heterogeneity (I^2)
Fixed Effect Model	0.18	0.18	0.02	[0.15,0.21]	23.015	0.0	98.6%
Random Effect Model	0.25	0.24	0.14	[-0.03,0.51]	3.655	0.000257	98.6%, T^2=0.426

Figure 4
Forest Plot - fixed and random effect models
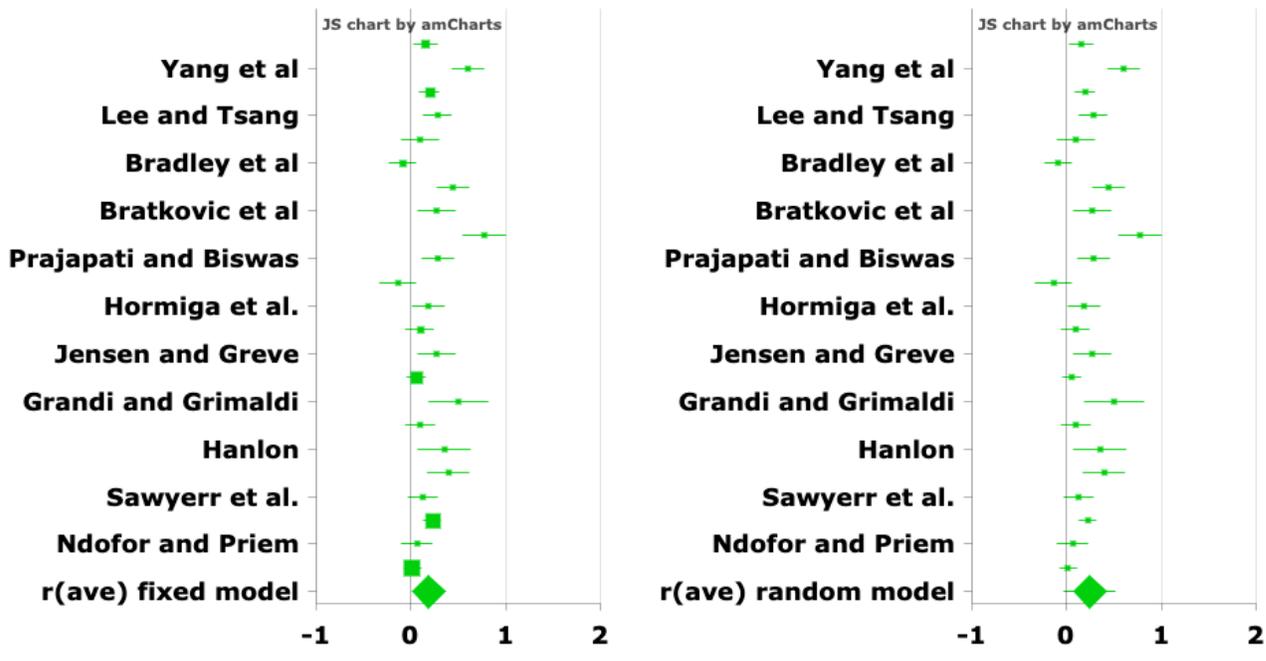
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