# Entrepreneurial Intention and Entrepreneurial Behaviour: A Social Psychological Perspective

MOHAMMED SHAMSUL KARIM

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## SUMMARY

Increasing the supply of entrepreneurs reduces unemployment and accelerates economic growth (Acs, 2006; Audretsch, 2007; Santarelli et el. 2009; Campbell, 1996; Carree & Thurik, 1996). The supply of entrepreneurs depends on the entrepreneurial intention and activity of the people (Kruger & Brazeal, 1994). Existing behavioural theories explain that entrepreneurial activity is an attitude driven process which is mediated by intention and regulated by behavioural control. These theories are: Theory of Planned Behaviour (Ajzen, 1991; 2002, 2012); Entrepreneurial Event Model (Shapiro & Shokol, 1982), and Social Cognitive Theory (Bandura, 1977; 1986; 2012). Meta-analysis of existing behavioural theories in different fields found that the theories are more effective to analyse behavioural intention and habitual behaviour, but less effective to analyse long-term and risky behaviour (McEachan et al., 2011). The objective of this dissertation is to improve entrepreneurship behaviour theory to advance our understanding of the determinants of the entrepreneurial intention and activity. To achieve this objective we asked three compelling questions in our research. These are: Firstly, why do differences exist in entrepreneurship among age groups. Secondly, how can we improve the theory to analyse entrepreneurial intention and behaviour? And, thirdly, is there any relationship between counterfactual or regretful thinking and entrepreneurial intention? We address these three questions in Chapters 2, 3 and 4 of the dissertation.

Earlier studies have identified that there is an inverse U shaped relationship between age and entrepreneurship (Parker, 2004; Hart et al., 2004). In our study, we explain the reasons for this inverse U shape (Chapter 2). To analyse the reasons we use Cognitive Life Cycle theory and Disuse theory. We assume that the stage in the life cycle of an individual moderates the influence of opportunity identification and skill to start a business. In our study, we analyse the moderation effect in early stage entrepreneurship and in serial entrepreneurship. In Chapter 3, the limitations of existing psychological theories are discussed, and a competency value theory of entrepreneurship (CVTE) is proposed to overcome the limitations and extend existing theories. We use a 'weighted competency' variable instead of a 'perceived behavioural control' variable for the theory of planned behaviour (TPB) and self-efficacy variable for social cognitive theory. Weighted competency is the perceived competency ranking assigned by an individual for his total competencies to be an entrepreneur. The proposed theory was tested in a pilot survey in the UK and in a national adult population survey in a South Asian Country. The results show a significant relationship between competencies and entrepreneurial intention, and weighted competencies and entrepreneurial behaviour as per CVTE. To improve the theory further, in Chapter 4, we test the relationship between counterfactual thinking and entrepreneurial intention. Studies in cognitive psychology identify that 'upward counterfactual thinking' influences intention and behaviour (Epstude & Rose, 2008; Smallman & Roese, 2009). Upward counterfactual thinking is regretful thinking for missed opportunities of a problem. This study addresses the question of how an individual's regretful thinking affects his or her future entrepreneurial career intention. To do so, we conducted a study among students in a business school in the UK, and we found that counterfactual thinking modifies the influence of attitude and opportunity identification in entrepreneurial career intention.

**Key Words**: Entrepreneurial Intention, Behaviour, TPB, Age, Counterfactual Thinking.

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(Mohammed Shamsul Karim)

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# GLOSSARY

ATTITUDE

**An attitude** is a mental state of readiness, learned and organised through experience, exerting a specific influence on a person's response to people, objects, and situations with which it is related. Generally, attitudes develop through a cognitive process from different perceptions which is an organised systematic process of receiving. Here, perception is the cognitive process by which an individual gives meaning to the environment. Perception involves receiving stimuli, organising the stimuli, and translating or interpreting the organised stimuli so as to influence behaviour and form attitudes.

VOLITIONAL CONTROL

**Volition** is the cognitive process by which an individual decides on and commits to a particular course of action. It is a situation where the decision process becomes automatised habits of action over time.

SUBJECTIVE NORMS

**Subjective norm** is the perceived social pressure to engage or not to engage in a behaviour.

PERCEIVED BEHAVIOURAL CONTROL

**Perceived behavioural control (PBC)** refers to people's perceptions of their ability to perform a given behaviour. PBC regulates the difference behavioural intention and behaviour.

COUNTERFACTUAL THINKING

**Counterfactual thinking** is a term of psychology that describes the tendency people have to imagine alternatives to reality. Counterfactual thinking can be two types - upward and downward. In an imaginative alternative when people consider how their predicament could have been better and regret for this, the condition is called upward counterfactual thinking. Downward counterfactual thinking improves people's mode for a moment by imagining how their predicament could have been even graver.

# LIST OF ACRONYMS

| | |
|---|---|
| TPB | Theory of Planned Behaviour |
| PBC | Perceived Behavioural Control |
| EE | Entrepreneurial Event Model |
| GEM | Global Entrepreneurship Monitor |
| CVTE | Competency Value Theory of Entrepreneurship |
| PSED | Panel Study of Entrepreneurial Dynamic |
| PSID | Panel Study of Income Dynamics |
| COMPENDIA | COMParative ENtrepreneurship Data for International Analysis |
| BHPS | British Household Panel Survey |
| SEM | Structural Equation Modelling |
| AIC | Akaike Information Criterion |
| BIC | Bayesian Information Criterion |

# Chapter One

## Introduction

Following the great works by Schumpeter (1934; 1942), entrepreneurship has been an attractive field of study for researchers interested in national economic development. Increasing the supply of entrepreneurs in the economy is a central preoccupation of governments, policy makers and scholars for two reasons. First, entrepreneurship accelerates economic growth (Baumol, 1990, 2004; Acs, 2006; Audretsch, 2007), and second, entrepreneurship reduces unemployment (Evans & Leighton, 1990; Reynolds et el. 1994; Santarelli et al. 2009; Campbell, 1996; Carree & Thurik, 1996; Lee et al., 2004; Tambunan, 1992; 1994). To increase the supply of entrepreneurs, it is important to understand the factors influencing the intentions and behaviour of potential entrepreneurs. Studies in this area have been investigating this issue for more than three decades.

Early studies identified the wide gap between entrepreneurial intention and behaviour (Blanchflower & Oswald, 1998; Henley 2007). Understanding the determinants that spur individuals' intended behaviour is important for understanding how to encourage more people to become entrepreneurs. Existing theories have identified the factors responsible for the development of individual intentions, but are less effective in explaining the variation between intention and behaviour (Armitage & Croner, 2001). Intention based psychological theories argue that the behavioural control variable can explain the differences between intention and behaviour. Kruger et al. (2000) suggest that behavioural theories can predict almost 30%-40% of the variations in the entrepreneurial intentions of students faced with imminent career decisions. However, improving the predictability of

entrepreneurship behaviour using behaviour theory is an area that has been rather overlooked. This study addresses the issue of how to improve the behavioural control variables employed in entrepreneurship theory. The objective is to improve the behaviour theories in entrepreneurship. To achieve this, we investigate three research questions. The first examines the causes of the inverted U-shaped relationship between age and entrepreneurship. Existing behaviour theories applied to entrepreneurship do not consider the direct influence of age on entrepreneurship behaviour. The second question examines the possibility of improving the predictability of the theory of planned behaviour (TPB) through the application of a weighted competency variable in place of a perceived behavioural control variable (PBC). The third question tests the influence of counterfactual thinking in the entrepreneurial intentions of university students. A relationship between counterfactual thinking and entrepreneurial intention would help to improve the predictability of the entrepreneurial behavioural models by introducing counterfactual thinking in these models. This chapter introduces the research questions and provides a brief discussion of existing behaviour theories applied to entrepreneurship. The first section reviews the concept of entrepreneurship, which is followed by a discussion of the behaviour theories applied to entrepreneurship.

## 1.1 CONCEPT OF ENTREPRENEURSHIP:

In order to analyse entrepreneurial activity or behaviour, we need to define the concept of entrepreneurship. There is no single definition of entrepreneurship and there are inconsistencies among existing definitions (Brockhaus & Horwitz, 1986, Sexton & Smilor, Wortman, 1987; Gartner, 1988; Waldringer et al., 1990). Definitions of entrepreneurship emphasise a broad range of activities including the creation of organisations (Gartner, 1988), the carrying out of new combinations (Schumpeter, 1934), the exploration of

opportunities (Kirzner, 1973), the bearing of uncertainty (Knight 1921), and the bringing together of factors of production (Say, 1803). The difference in these definitions lies in the approaches to entrepreneurship. The scholars working on entrepreneurship are mainly from economics and organisation. Different disciplines contribute to both these perspectives. Story and Green (2010) argue that economists emphasise choices and information processing, and organisational theorists focus more on cognitive processes. However, there is a disagreement between organisational theorists regarding the range of activities that should be considered entrepreneurial activity.

Stevenson and Jarillo (1990) define entrepreneurship as "a process by which individuals – either on their own or inside organisations – pursue opportunities without regard to the resources they currently control". Bygrave and Hoper (1991) define entrepreneurship as the function, activities and actions associated with the perception of opportunities and creation of organisations. Similarly, Shane and Venkataraman (2000) define entrepreneurship as an opportunity driven process. However, more recently entrepreneurship has come to be defined as a process of firm (organisation) formation (Klyver et al., 2008; Reynolds, 2009; Spencer et al., 2008, Kuenten et al., 2013). The Global Entrepreneurship Monitor (GEM) project defines entrepreneurship as a process of starting up a business or firm (Reynolds et al., 2005). This definition implies that entrepreneurship is not necessarily opportunity driven, but might also be necessity driven. However, whether the process is necessity or opportunity driven, the activities involved are almost the same. So, we prefer to emphasise the activities involved in the process. In this study, entrepreneurship is defined as a process of involving a set of activities required to start a firm. To analyse these activities or behaviour, we draw on three behaviour theories used in entrepreneurship. In the following section, we briefly review these theories.

## 1.2 ENTREPRENEURIAL INTENTION AND BEHAVIOUR THEORIES:

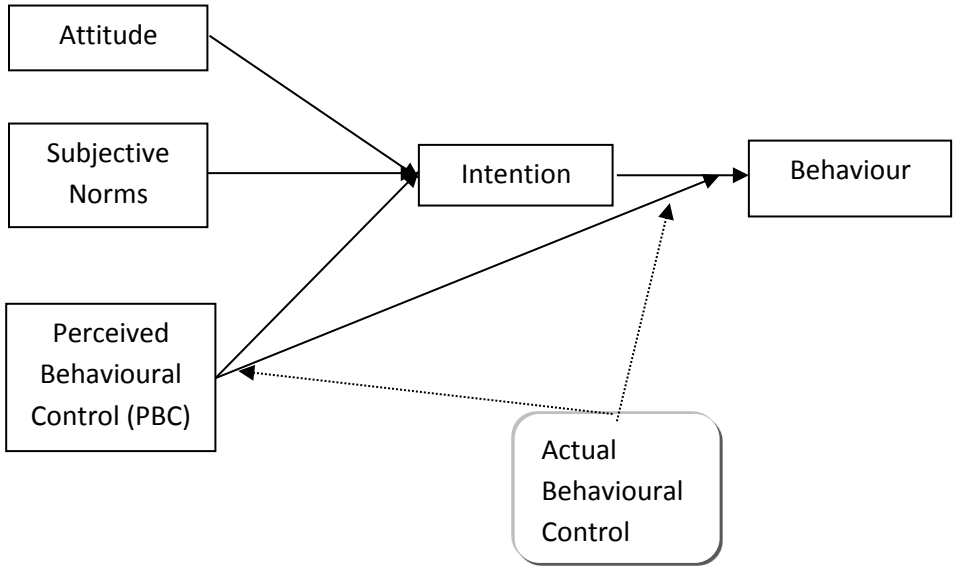
Three main entrepreneurship theories are used to analyse entrepreneurial intention and behaviour. These are: TPB (Ajzen, 1991), entrepreneurial event model (Shapeor & Shokol, 1982), and social cognitive theory (Bandura, 1986; 2006; 2008; 2012). The theory of planned behaviour is the most popular and is widely used to analyse human activity in various fields. Google Scholar shows that the theory received 22,206 citations by 22 August, 2013 compared to social cognitive theory which had received 3,350 citation on the same date. However, Bandura's self-efficacy theory, which is a component of social cognitive theory, received 30,449 citations. Ajzen (2002) claims he owes his self-efficacy theory to the PBC component of TPB theory. PBC builds on the concept of self-efficacy. The entrepreneurial event model has received much less attention than these other two models, with a total of 1,395 citations. However, the entrepreneurial event model is only applied to analysis of the entrepreneurial action.

### 1.2.1 Theory of Planned Behaviour

TPB is a social cognitive theory applied to analyse human intention and action. It proposes that human behaviour is guided by three beliefs: behavioural beliefs - beliefs about the likely consequence of a behaviour; normative beliefs – beliefs about normative expectations of other people' and control beliefs – beliefs about the presence of factors that may advance or reduce performance of the behaviour. Behavioural beliefs refer to attitudes to a behaviour; normative beliefs refer to perceived social expectations or social norms; and control beliefs refer to PBC. Attitudes toward the behaviour, subjective norms and PBC in combination produce the behavioural intention which is the immediate antecedent to a behaviour. Here, intention mediates between attitude, subjective norms and actual behaviour. According to Ajzen (2002), at this stage having sufficient control

over behaviour, the individual is expected to carry out his/her intention when an opportunity arises. The theory is shown in the Figure 1.1.

Figure 1.1: Theory of Planned Behaviour




Source: Ajzen (1991; 2002; 2011)

TPB is based on the theory of reasoned action (Fishbein & Ajzen, 1975). According to the theory of reasoned action, behavioural intentions are formed by the individual's attitude to that behaviour and his or her subjective norms – (i.e. influence of significant others – e.g. peers, role models, relatives, etc). TPB differs from earlier theories by including the additional control of PBC, which moderates the individual behavioural intention (Friedkin, 2010). The beauty of TPB lies in its simplicity. However, several scholars have criticised this simplicity (e.g. Uhlmann & Swanson, 2004; Wegner, 2002; Wegner & Wheatley, 1999; Aarts & Dijksterhuis, 2000). Ajzen (2011) addresses some of the issues raised in his

editorial to ‘The theory of planned behaviour: Reactions and reflections’. However, entrepreneurship studies that use TPB diminish the legitimacy of his claims (Kovereid & Isaksen, 2006). To simplify the theory, Ajzen ignores the impact of individual background factors. According to Ajzen (2011, p.1123),

*‘The theory points to a host of possible background factors that may influence the beliefs people hold – factors of a personal nature such as personality and broad life values; demographic variables such as education, age gender and income; and exposure to media and other sources of information. Factors of this kind are expected to influence intentions and behaviour indirectly by their effects on the theory’s more proximal determinants.’*

Along these lines claim, attitude, social norms and perceived behaviour control should absorb the influences of background factors in intention and behaviour analysis. Based on this assumption, to simplify the theory, Ajzen does not include background factors in his theory. However, entrepreneurship studies (Kovereid & Isaksen, 2006) that employ TPB find that age and gender have a significant direct influence on entrepreneurial intention and/or behaviour. Age is a highly significant factor in entrepreneurial activity. Previous work on entrepreneurship shows that the relationship between entrepreneurial activity and the age of an individual takes an inverted U shape (Parker, 2009; Hart et al. 2004). This explains the direct influence of age on entrepreneurship. However, this work does not provide an explanation for the existence of this inverse U shaped relationship. In cognitive psychology, age is considered a complex cognitive variable (Stuart-Hamilton, 2012). Human memory, intelligence and use of skills all depend on the physical age of the individual. Life span psychology explains the performance of cognitive aspects related to

individual physical age. If life span psychology is able to explain this inverse U shaped relationship, this would allow age and demographic factors more broadly, to be included in the model to analyse the direct effect of age on entrepreneurial intention and activity. Our aim is to study the influence of cognitive conditions related to age on entrepreneurial activity. Research questions related to age and entrepreneurship are formulated in Chapter 2.

Recent meta-analysis of prospective predictions of health-related behaviours based on the theory of planned behaviour (McEachan et al., 2011) contained in 206 articles shows that the theory is better at predicting physical activity and eating behaviours (about 23.9% and 21.2%) than at predicting risky behaviours (13.9%). McEachan et al. also found it is easier to predict short term behaviour. In a meta-analysis of 185 independent studies on the efficacy of the TPB, Armitage and Conner (2001) found that TPB explains 31% of behavioural variation if the behaviour is self-reported, and 21% of variation if the behaviour is observed. McEachan et al. (2011) found the same difference (more than 10%) between self-reported and observed in studies of behavioural variation. These explain the potential bias in self-reported responses. In addition, Schulze and Wittmann (2003) in another meta-analysis comparing the theory of reasoned action and the TPB found that PBC has no significant influence on the prediction process. This raises the question of how to improve the predictability of the behavioural control variable by minimising the response bias. Since the behavioural control variable regulates the behavioural intention for desired behaviour, improving the variable will explain more accurately whether an individual is ready to start a business to implement his intention. This will also help us to understand which control factor is responsible for not carrying out the intended behaviour.

### 1.2.2 Entrepreneurial Event Model:

The entrepreneurial event (EE) model suggests that entrepreneurial intentions are evident in ‘entrepreneurial event formation’. Shapero and Sokol (1982) considered the life path changes and their impact on the perception of desirability and the perception of feasibility related to new venture formation. The model assumes that the displacement or critical life changes impel a change in entrepreneurial intention and in subsequent behaviour. The displacement can be in a positive or negative. Negative displacement pushes and positive displacement pulls people to potential business start-ups. Displacement is the catalyst for a change in behaviour that helps people to act based on their perception of desirability and the perception of feasibility to start a business. Thus, the entrepreneurial event requires the potential to start a business exists prior to starting the business. The model is depicted in Figure 1.2.

Figure 1.2: Entrepreneurial Event Model (EE)


Source: Shapero & Shokol (1982)

This theory suggests that human behaviour remains in a state of inertia until there is a displacement. Displacement precipitates a change in behaviour where the decision maker seeks the best alternative among the available alternatives. The perceived desirability is the personal attractiveness of starting a business. The perceived feasibility is the degree to which the individual feels personally capable of starting a business. Individual desirability

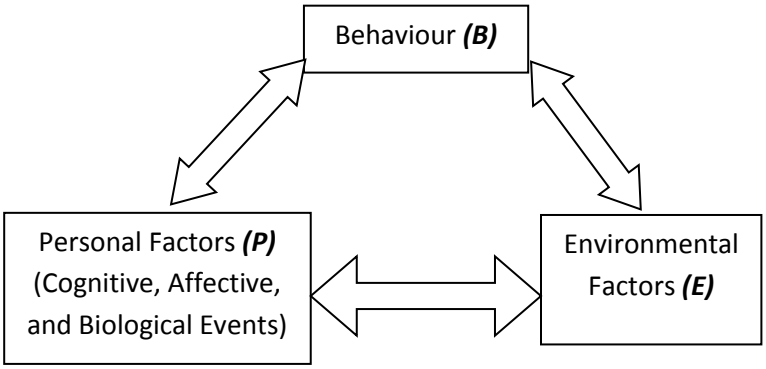
is formed through 'intuitive thinking' in the intention process, and feasibility is based on 'rational thinking' (Bird, 1988). The intention to become an entrepreneur (or to engage in an entrepreneurial event) depends on the perceived desirability and feasibility of that event. Entrepreneurial events require that the potential to start a business exists before the displacement.

Krueger et al. (2000) find that the TPB and the EE models give similar results for predicting entrepreneurial intention. However, the adjusted R square of the EE model is slightly higher compared to the TPB model. The adjusted R square for the EE model is 0.408 and the adjusted R square for TPB model is 0.350. Though the EE model is an implied intention based model (Kruger et al., 2000), it has received less attention from scholars of entrepreneurship. In comparing the TPB and EE models, Kruger et al. (2000) consider self-efficacy (Bandura, 1986) as the antecedent to perceived feasibility. Since 2004, several studies of entrepreneurship have used self-efficacy (a list of recent studies is provided in Chapter 3, Table-3.1), but only a few use the EE model.

### 1.2.3 Social Cognitive Theory

According to social cognitive theory (SCT) the behaviour of the individual is the result of the interaction between personal attributes and the individual's external environment. Bandura (1986) argues that personal attributes, external environmental factors and overt behaviour all operate as interlocking mechanisms that affect one another bi-directionally. The theory is depicted in Figure 1.3.

Figure 1.3: Social Cognitive Theory




Source: Bandura (1986; 2006; 2008; 2012).

SCT assumes that behaviour results from the interaction between person and environment***, B= ƒ (P ⇄ E).*** That is, behaviour is considered as the by-product of the P – E transaction, rather than as a co-determinant of this transaction. The interaction between the person and the environment involves the individuals' beliefs and cognitive competencies which are developed according to the physical and social environment. Here, social environment refers to the individual's family members, friends and role models; and physical environment refers to his/her surroundings and access to resources (Pajares, 1997). For any specific behaviour, self-efficacy appraisal is the most important aspect of the theory. Bandura (1977) explains self-efficacy appraisal in his self-efficacy theory. Self-efficacy refers to "people's judgements of their capabilities to organise and execute courses of action required to attain designated types of performance". Self-efficacy is a dynamic set of self-beliefs that are specific to particular performance domains and that interact in complex ways with other persons, behaviours and contextual factors. Self-efficacy beliefs affect 'the quality of human functioning through cognitive, motivational,

affective, and decisional processes' (Bandura, 2012, p. 13). In particular, perceived self-efficacy helps to determine one's choice of activities and environment.

SCT has been widely used to study entrepreneurial intention and behaviour, particularly the self-efficacy component of the theory. This work suggests that self-efficacy has a significant influence on entrepreneurial intention (Moriano et al, 2012; Prieto et al, 2010; Gelderen et al, 2008; Prodan and Drnovsek, 2010; Lee et al., 2011; Kickul et al., 2008).

### 1.3 INTENTION, BEHAVIOURAL CONTROL, AND BEHAVIOUR:

Cognitive based behavioural theories argue that actual behaviour depends on the behavioural intention and behavioural control. Behavioural control is the self-regulated rationale to be involved in the behaviour. This behavioural control is referred to respectively as PBC, perceived self-efficacy, and as perceived feasibility in the TPB, SCT and EE models. Bandura (2012) argues that self-efficacy influences goal (intention) and behaviour. On the other hand, self-efficacy is the antecedent to perceived feasibility (Kruger et al., 2000). So, there are two main behavioural controls in the above theories: PBC and perceived self-efficacy. Ajzen (2002) analyses the differences between PBC and perceived self-efficacy and argues that perceived self-efficacy is a component of PBC. The difference is shown in Figure 4.1.

Figure1.4: Model of Perceived behavioural Control


Source: Ajzen (2002)

According to Ajzen (2002), PBC is the result of control belief strength (c) and control belief power (p). In accordance with expectancy value formation, Ajzen (2002) argues that multiplying belief strength and power will give the PBC, PBC $\propto \sum c_i p_i$. Expectancy value theory (Fishbein, & Ajzen, 1972) suggests that "people orient themselves to the world according to their expectations (beliefs) and evaluations". This theory assumes that people can properly evaluate their environment and it will remain consistent until they perform the behaviour. Failure to evaluate the environment may result in poor behavioural control. In another study, Ajzen et al. (2011) argue that TPB gives better prediction when there is full information on the situation. Previous meta analyses show that behavioural prediction works better in habitual or prior experience conditions. In entrepreneurship studies, the predictability of the PBC variable of TPB (Audet, 2004) is debated. In recent analysis,

Kautonen et al. (2013, 2013a) find that TPB can predict behaviour successfully. However, there are some fundamental flaws in their work, particularly selection and measurement problems. In addition, there is insufficient background information on their respondents which does not allow us to check whether these significant results are due to sufficient previous knowledge about entrepreneurship as Ajzen et al. (2011) argue.

In reality, most entrepreneurs have neither a business nor any other kind of university or college degree. People can access primary business knowledge through education and training, prior business experience or experience of growing up in a family business environment. Many will have limited access to knowledge about complex business environments which will render them optimistic about their self-efficacy. This affects the accuracy of responses between those who have comprehensive knowledge and those who do not have comprehensive knowledge about their complex business environment. In this case, the product of belief strength multiplied by power may explain the intention better than the actual behaviour. Here we use weighted strength (competency) and the ratio method to minimise any bias. Weighted competency can provide better behavioural control. Thus, it is important to test the influence of competency and weighted competency for entrepreneurial intention and entrepreneurial behaviour. In the present research we are interested in improving the behavioural control variable. For this reason, we need to know how weighted competency influences entrepreneurial intention and entrepreneurial activity. This question is discussed in Chapter 3. We are also interested in the significance of the demographic variables in the behavioural model to explain entrepreneurial behaviour. This follows up on the results in Chapter-2.

## 1.4 COUNTERFACTUAL THINKING AND INTENTION:

Counterfactual or regretful thinking is a mental state related to missing an opportunity. In psychology, a regretful condition is defined as counterfactual thinking since the individual engages in an imaginary alternative evaluation of a missed opportunity, of 'what might have been' if the opportunity had not been missed. Studies in psychology find that counterfactual or regretful thinking influences future intentions and behaviours (Smallman & Roese, 2009). This shows that there is a possible relationship between counterfactual thinking and entrepreneurial intention. Thus, are interested in testing for relationships between counterfactual thinking and entrepreneurial intention. Any relationship between the two would increase the effectiveness of the behavioural model. For this reason, any relationship between counterfactual thinking and entrepreneurship would allow us to include counterfactual thinking in our entrepreneurship behaviour model to improve its effectiveness.

Early studies in entrepreneurship found a significant difference between entrepreneurs and non-entrepreneurs based on counterfactual thinking (Baron, 2000). However, it has yet to be established whether counterfactual thinking has an influence on entrepreneurial intention or behaviour. We investigate this in Chapter 4.

## 1.5 RESEARCH QUESTIONS:

Based on the above discussion the research questions addressed in this dissertation are:

1) What causes an inverse U shaped relationship between age and entrepreneurship?

2) How does the weighted competency variable improve the behavioural control in entrepreneurial intention and behaviour analysis?
3) What is the relationship between counterfactual thinking and entrepreneurial intention?

Investigating these three questions should show whether we can improve on entrepreneurship behaviour theory. The first question refers to the importance of age in entrepreneurial behaviour analysis from a psychological perspective. The second question tests weighted competency to improve the predictability of behavioural control to analyse entrepreneurial intention and behaviour. The third question investigates the relationship between counterfactual thinking and entrepreneurial intention. Taken together, the solutions to these questions should improve our understanding of entrepreneurial behaviour. The findings from this dissertation should provide a better understanding of the determinants of entrepreneurial intention and behaviour from a social psychological perspective.

Chapter-2 addresses question one. There are compelling reasons to assume that the cognitive development of individuals along their life cycle is responsible for the relationship between age and entrepreneurship. For this reason, to analyse the influence of age on entrepreneurship, in Chapter 2, we apply life span cognitive theory. In life span cognitive analysis, human life spans have three stages. We analyse the influence of individual cognitive development on opportunity identification and skills, the key determinants of entrepreneurship. Opportunity identification and skills are commonly used as behavioural control variables in intention based theories. As per cognitive life span theory, an individual will react to the same stimuli in different ways in different stages of the life span, but how a young adult responds to a stimulus will be different from the reaction of someone middle

aged. The reaction of an individual in old age will be different from the reactions in the previous two stages. This is due to the different life orientation in the different stages of the life cycle. In this chapter, we analyse how these life cycle orientations affect the influence of opportunity identification and skills in entrepreneurial behaviour in the early stage and in serial start-ups.

Age is a complex psychological variable (Stuart-Hamilton, 2012) with different psychological characteristics in different stages of life cycle. Age related psychological characteristics can explain individual differences over the life cycle. To answer our research question we use three age groups – young adult, middle aged, and late adult. In our analysis, we use the GEM UK dataset for 2002-2010. We analyse the interaction effect of age groups with opportunity identification and business start-up skills in the early stage and in the serial start-up stage. To analyse the interaction effects we consider age related characteristics such as information processing speed and use of skills.

The theme in Chapter 3 is improving the effectiveness of existing intention based entrepreneurship behaviour theories, especially the TPB. Chapter 3 investigates the predictive validity of the behavioural control variable in competing models to improve the effectiveness of predicting entrepreneurship behaviour. In the TPB, behavioural control is the product of the strength of the ability belief times the power of the ability belief. We are interested in the process of measuring behavioural control. Since the strength and the power of the ability belief are measured based on subjective self-evaluation, a biased response might reduce the predictability of the theory. We assume that weighting the strength of the ability belief by the power of the ability belief will reduce response bias and, in turn, improve the predictability of the theory. In our analysis, we used different required

competencies to measure the ability belief for behavioural control. Based on our analysis, we propose the competency value theory of entrepreneurship (CVTE) to advance existing theories by overcoming some of their limitations. The CVTE includes demographic variables and uses weighted competency variables to analyse behavioural control. We compare the predictability of the weighted competency variable with the PBC variable in the TPB and the self-efficacy variable in SCT. To compare the models, we conducted a pilot survey to collect data in the UK, and draw on a national survey in a South Asian country. We analyse the predictability and the fitness of the models.

Chapter 4 analyses the impact of counterfactual thinking on entrepreneurial career intention. Recent studies in psychology (Smallman & Rose, 2009) find that counterfactual thinking develops intention, which in turn changes the behaviour. This relationship has been unexplored in entrepreneurship. Based on the findings in psychology, we analyse both the direct and indirect impacts of counterfactual thinking on entrepreneurial intention. Engaging in counterfactual thinking modifies the individual's beliefs, which in turn modifies his/her attitude and changes both intention and behaviour. In our study, we analyse the effect of counterfactual thinking on both attitude and opportunity identification in entrepreneurial intention. Since counterfactual thinking is the result of regret over a missed opportunity, we assume that counterfactual thinking modifies opportunity identification and attitude. This modification affects the intention of an individual. We test the influence of counterfactual thinking among students in a UK business school. Our analysis of the impacts of counterfactual thinking on entrepreneurial intention concludes the dissertation.

To achieve our objectives, Chapter 2 justifies the importance of age in behaviour analysis, Chapter 3 analyses the effectiveness of the weighted competency variable to improve the

predictability of entrepreneurship behaviour, and Chapter 4 analyses the influence of counterfactual thinking in entrepreneurial intention. The three chapters taken together should improve understanding of entrepreneurship behaviour.

## 1.6 RESEARCH APPROACH

The objective of this study is to improve entrepreneurship behaviour theory to enhance our understanding of the entrepreneurial intention and behaviour. For this reason, we adopt the deductive method in our research. In line with deductive theory, we develop our research hypotheses in relation to the research questions, based on the theory and the related entrepreneurship literature. Deductive research is driven by the theory in the field. We use early theories in this research. Traditionally, quantitative research is the technique associated with deductive theory. In social science research, quantitative methods are used in line with the objectivist paradigm (Bryman & Bell, 2007). Qualitative research provides insights towards building up and extending our understanding and ideas. It helps to uncover the underlying thoughts and opinions, and to investigate deeper into a problem. On the other hand, quantitative research is used to quantify differently-defined variables and to generalise the results. Quantitative research method is widely accepted for the reasons of generalisability, reliability, replicability and validity of the research process and outcomes. The reasons are explained below:

First, the results of quantitative research can be more generalised since measures are taken to make the research design unbiased. Random sampling is used for sample selection. As a result, each member of the population has an equal chance of being part of the sample. This makes the outcomes of quantitative research more generalisable than the outcomes of qualitative research. Second, the results of quantitative research are more

reliable than those from qualitative research. Reliability refers the consistency of the results over time, and the true representation of the population. Third, replicability measures the ability of the procedure to be reproduced and repeated. To claim something in general, it must be replicable without significant error. Finally, validity refers to the accuracy of the indicator of interest. Thus, quantitative research is regarded as superior to qualitative research to capture general and overall relationships. However, qualitative research is better for gaining an initial understanding of the underlying reasons and motivations. Qualitative research helps to develop hypotheses for potential future quantitative research. In our research, we are interested in finding a general behavioural relationship based on social psychological theories; thus, we prefer quantitative research and an objectivist approach.

## 1.7 RESEARCH FRAMEWORK:

This study addresses the three research questions in Section 1.5. The objective is to improve entrepreneurship behaviour theory. The three research questions address three gaps in the existing research. First, we attempt to identify the causes of the inverse U shape relationship between age and entrepreneurial activity. Second, we test the relationship between behavioural control and entrepreneurial behaviour. Previous studies have found an insignificant relationship between behavioural control and actual behaviour. We try to capture the influence of behavioural control in the entrepreneurial activity by using the weighted competencies of an individual. Third, we test the relationship between counterfactual thinking and entrepreneurial intention. Any significant relationship in the above three questions mentioned in section 1.5 will improve the existing behaviour theory.

The first research question tests the importance of age in behaviour analysis using cognitive theories. The results identify the importance of age in the entrepreneurship behaviour analysis from a social psychological perspective. The second question tests the influence of weighted competency as the behavioural control. The results introduce weighted competency instead of PBC in entrepreneurship behaviour analysis. The third research question tests the relationship between counterfactual thinking and entrepreneurial intention. The results identify the importance of including counterfactual thinking in entrepreneurship behaviour analysis. The investigation of these three research questions improves entrepreneurship behaviour analysis using SCT.

Existing behaviour theories assume that the influence of age in the decision making process is captured by attitude, and do not consider age in the entrepreneurship behaviour analysis. We want to test the relationship between age and the other key determinants of entrepreneurship behaviour. In entrepreneurship research, age is considered a complex psychological variable. It captures the influence of different cognitive variables. Since age is a complex cognitive variable, we are interested in testing the relationship between age and entrepreneurship. Earlier studies found an inverse U shaped relationship between age and entrepreneurship. However, these studies do not explain the reasons of this relationship. We assumed that the influence of key determinants in entrepreneurship is modified by age from a cognitive reference point. In our study, we analyse the influence of age on opportunity identification and business start-up skills in entrepreneurship activity. To analyse the relationship between opportunity identification, business start-up skills and age, we use two SCTs. These are life span cognitive theory and disuse theory. We analyse the influence of growing age on opportunity identification and business skill to start a business. Since this influence will be different for serial entrepreneurs because of the

schema effect, we test the influences separately for serial entrepreneurs. To analyse the relationship we interact age and opportunity identification, and age and skill, in early stage business start-up activity, and in serial start-up activity. To test the relationship we control for attitude. This reduces the influence of attitude on the relationship with entrepreneurship behaviour and allows more accurate identification of the direct and indirect influences of age. To analyse the relationships, we used logit regression and double difference techniques. Details of the analysis technique are given in the methodology section in Chapter 2. Based on the tested relationship between age and entrepreneurship in Chapter 2, in Chapter 3, we further test the relationship between the demographic variables and entrepreneurship behaviour. Chapter 3 tests two relationships : demographic variable and entrepreneurial intention, and behavioural control and entrepreneurial activity.

Earlier studies found a weak relationship between behavioural control and behaviour. Behavioural control has a significant relationship with behaviour in the case of habitual behaviour. This shows a poor generalisability, reliability, replicability, and validity of the behavioural control construct and, in turn, entrepreneurship behaviour theory. On this basis, we assume that a weighted competency variable might improve the behavioural control of entrepreneurship behaviour – the topic of research question no. 2. In the TPB (Ajzen, 1991; 2006), behavioural control is measured by multiplying control belief strength and control belief power. We assume that this belief strength and power provide an accurate decision condition when the situation is known. If the situation is less familiar or complex, multiplying control belief power and control belief strength will not provide behavioural control in the actual behaviour. Thus, we choose weighted competency instead of PBC to measure behavioural control. To measure weighted competency, first, we identify individual perception about the value or importance of the competencies

required to start and run a business. Second, we identify individuals' self-strength in each competency. In the third stage, we calculate the relative weight of each competency based on the total assigned value for all competencies to start and run a business. To calculate the weighted competency, we multiply the strength of a competency by its respective weight. Finally, we analyse the relationship between weighted competency, entrepreneurial intention and entrepreneurial behaviour. To analyse this relationship we employ logit regression. The details of the research design and the analysis technique related to the research question no. 2 are given in the methodology section in Chapter 3.

In recent years, it has been observed in social psychology research that counterfactual thinking influences individual intention and behaviour. Existing research in entrepreneurship based on counterfactual thinking is limited to the differences between entrepreneurs and non-entrepreneurs. Understanding the influence of counterfactual thinking on entrepreneurship is important to improve entrepreneurship behaviour theory. Any significant relationship between counterfactual thinking and entrepreneurial behaviour will contribute to entrepreneurship behaviour theory. However, previous studies of entrepreneurship do not test the relationship between counterfactual thinking and entrepreneurial intention. The third research question enquires about the relationship between counterfactual thinking and entrepreneurial intention. Counterfactual thinking is the result of forgone opportunities and is contextual. Contextual counterfactual thinking has a direct influence on intention. On the other hand, counterfactual thinking in a different context indirectly influences the behavioural intention in other areas (Smallman & Roese, 2009). Based on this research finding about counterfactual thinking and intention, we test both the direct and indirect relationships between counterfactual thinking and entrepreneurial intention. To measure the indirect relationship, we interact counterfactual

thinking with attitude and opportunity identification to start a business. To analyse the relationship we used logit regression. The detailed research design and analysis techniques related to research question no. 3 are given in Chapter 4.

### 1.8 SAMPLING AND DATA:

Several datasets have been used to study entrepreneurship including data from Panel Study of Entrepreneurial Dynamics (PSED) and the Panel Study of Income Dynamics (PSID) in the USA, the British Household Panel Survey (BHPS), EURO Barometer statistics or Comparative Entrepreneurship Data for International Analysis (COMPENDIA), and Global Entrepreneurship Monitor (GEM) datasets. Among these, GEM covers a wide range of variables across some 80 countries. However, none of these datasets is sufficient for all of the variables in our study. GEM UK data provide information for the variables required to address the first research question. For the second and third research questions, we collected necessary data through field survey.

GEM UK data is cross sectional pooled data. The characteristics of the data are provided in the methodology section in Chapter-3. The GEM UK 2002-2010 dataset includes 86,670 eligible observations for early stage entrepreneurship, and 1,373 observations for serial entrepreneurship. However, the data are not sufficient for the second and third research questions. We checked all available datasets for the competency strength, value of the competency and counterfactual thinking variable, but did not find any suitable. We, therefore, decided to conduct two separate surveys to cover the variables for the second and third research questions. To study the second research question, we developed a questionnaire and conducted a pilot survey in a business school in UK. After testing the

questionnaire in a pilot survey, we conducted a national survey in Bangladesh. The data were collected by the Bangladesh GEM team. The questionnaire asks for information on entrepreneurial intention, entrepreneurial activity, demographic variables, attitude, social status, individual self-reported competencies and perceived value of the competencies required to be an entrepreneur. We used Likert scales for all the variables except the demographic variables and perceived value of the competencies. The study was administered to 2,000 randomly selected respondents in Bangladesh. Details of the pilot and national survey design are provided in the methodology section in Chapter 3. The national level study in Bangladesh does not include information related to the variables for the third research question due to financial constraints and the nature of the question. We ran a separate survey to test the hypotheses related to research question no. 3.

For the third research question, we developed a questionnaire and conducted a survey in a business school in UK. Since we are interested in testing the direct and indirect relationship of counterfactual thinking, we surveyed business students to achieve similarity of context for business start-up. We simulated a potential business context for the students and asked if they were to miss the opportunity, whether they would regret it. We also collected their future business start-up intentions, attitudes, opportunity identification, skills, social network, financing, parents' self-employment and other related data. We used the Likert scale for all variables except parents' self-employment and gender. To collect the data we visited the classrooms of second and third year undergraduate students. We invited the students to participate in the study and assured them that participation was voluntary. A total of 106 students participated in the study. We chose undergraduate students because of their imminent entry to the job market. A detailed description of the

research design and the data collection process related to research question no. 3 is provided in Chapter 4.

### 1.9 LIMITATIONS:

The study has some limitations. Firstly, there is no single dataset to test the hypotheses. We used GEM data and conducted two separate surveys to test our hypotheses. The data have some limitations. GEM data report respondents' self-perceptions about start-up skills and opportunity identification. Both the variables are dichotomous. Some researchers may be sceptical about self-perception and the dichotomous characteristics of the data. Specifically, the GEM survey collects dichotomous responses for the attitude and perception variables. Studies in entrepreneurship from psychological perspective use the Likert scale or other measurement scales for attitude or perception. They argue that 'yes' and 'no' options do not express all possible responses. Though this limitation remains, GEM data are widely used in entrepreneurship research.

Secondly, our study uses cross sectional data. Our survey data and the GEM UK dataset are cross sectional. These provide a snapshot of the relationship between entrepreneurial activity and the independent variables. On the other hand, longitudinal data help to investigate the changes in the relationship over the time. In behaviour studies, both cross sectional and longitudinal data are used (Salthouse, 2009; Schaie, 2009). However, for the behaviour analysis a longitudinal study would be more appropriate. BHPS data are the available alternative, but the dataset does not have sufficient variables to test the relationships. Since human intention and behaviour change over time, longitudinal data

are more relevant for a behaviour study. In our study, time and financial constraints did not allow us to test the relationship between entrepreneurial intention and activity.

Thirdly, we used single item constructs in our questionnaire survey. In behavioural research, some researchers are sceptical about single item constructs. However, previous studies have found no significant differences in the results from single item constructs and multiple item constructs. It is accepted that if the construct is well known and easy to understand, a single construct can capture the necessary responses. Since our constructs are familiar and easy to understand, we use a single item construct. However, critics of the single item construct might argue about its appropriateness.

Fourthly, we study counterfactual thinking among 106 undergraduate business students. Researchers might be sceptical about the size of the sample and the career choices of 2nd and 3rd year undergraduate students. Though the sample size is small, it compares with other similar studies. For example, Dimov (2007) studied 107 MBA students to analyse opportunity intention and Smallmann and Roese (2009) conducted three studies to analyse counterfactual thinking and behavioural intention on sample sizes of 30, 46 and 50. Baron (1999) conducted his study of 102 respondents from different backgrounds to analyse counterfactual thinking and venture formation. In this context, our sample size is sufficient to study counterfactual thinking and entrepreneurial intention. We chose 2nd and 3rd year undergraduate students since they are likely to be thinking about career choices at this stage. However, some researcher might argue that a sample of only 3rd year students might be more relevant.

Fifthly, we use GEM UK data to analyse the relationship between age and serial entrepreneurship. The process of selecting serial entrepreneurs in the study has created potential sampling bias. The potential of sample selection problem has been created in two stages – first, in the process of selecting nascent entrepreneurs; and, second, in the process of selecting serial entrepreneurs from the nascent entrepreneurs. Existing selection models deal with a single stage selection problem in the data. Since we have selection problem in two stages, analysing selection problem was complex for us. So, we continue our study with this data limitation.

Finally, GEM data and counterfactual thinking data apply to the UK and the weighted competency data are from the Bangladesh context. We use this different contextual data for separate questions. Although we use these for separate research questions, some may argue that we use them for the same objective. Since we do not compare the country contexts in our study, we do not anticipate any problems related to internal or external validity.

# Chapter Two

## Age and Entrepreneurship

### 2.1 INTRODUCTION:

Following the limited success in the 1980s of 'personality trait' theory to identify the entrepreneurial traits because of the variety of traits, 'cognitive' and 'planned behaviour' theories (Ajzen, 1991; Kruger et el, 2000) have become popular since 2004. However, these theories assume that the factors influencing entrepreneurship have similar effects on cognitive conditions and behaviour, irrespective of the psychological development of different age groups. For example, attitude or the behavioural control variable of TPB cannot encompass all the characteristics of differences in people's age related cognitive conditions. Since the psychological development of an individual is a contextual and life-long process (Bandura, 2001, 2002), individual perception, intention, self-efficacy, and cognition will be different at different stages in the human life cycle. The level of cognitive development of young adults and other age groups will differ because of the different nature of the interaction with real world situations and cognitive development stages. Hence, the responses of different age groups to stimuli will not be identical within the same entrepreneurial environment.

Life span psychology explains changes in cognitive conditions and their effects in different life stages. In lifespan psychology, physical lives fall into the three groups of young, middle age, and old age (Craik & Bialystok, 2006). Existing works identify the determinants and status of entrepreneurship in the old age group and consider the ageing problem in the west (Bönte et al., 2009; Curran & Blackburn, 2001; Hart et al. 2004; Kautonen et al., 2008; Weber & Schaper, 2003). Some works examine prime age entrepreneurship which

covered the age span from 20 to 49 years or the middle age group. Work on young adult (youth) entrepreneurship focuses mainly on school choice, enterprise education and entrepreneurial intention (Hoxby, 2004; Rouse, 1998; Metcalf et al., 2001; Sobel & King, 2008, Athayde, 2009). These age based works address some of the characteristics of entrepreneurship related to age; however, so far, there is no work that analyses the influence of age related cognitive development in relation to entrepreneurship. Work on in cognitive development related to entrepreneurship look at the general mental framework of entrepreneurs (Gaglio & Katz, 2001). However, it is important also to explore the influence of the cognitive development of age groups on the determinants of entrepreneurship. This will allow entrepreneurship programmes to be tailored to the cognitive levels of different age groups.

In entrepreneurship, opportunity identification abilities and start-up skills are the key determinants of entrepreneurial activity. Opportunity identification stimulates business start-up activity, and starting a business requires particular skills. Opportunity identification competences (Gaglio & Katz, 2001) and individual skills (Bjork & Bjork, 1992) depend on the individual's cognitive development. Age is a rough index of a person's psychological or cognitive development (Hoyer & Roodin, 2009). Since opportunity identification and skills depend on cognitive development, the age of an individual can modify the influence of opportunity identification and firm start-up skills. Previous entrepreneurship studies (Parker, 2009; Hart et al., 2004) find an inverse U-shaped relationship between age and entrepreneurial activity. However, existing work on entrepreneurship does not explain why individuals differ in their entrepreneurial activity by age. One of the reasons might be that age modifies the influence of both opportunity identification and start-up skills, which results in variation in entrepreneurial activity by age.

Numerous studies (Parkar, 2012; Ucbasaran et al., 2009; Shepherd & DeTienne, 2005) find that habitual or serial entrepreneurs are better at identifying opportunities. Gaglio and Katz (2001) argue that those with earlier start-up experience develop a complex mental framework that allows them to identify opportunities more quickly. This might explain why serial entrepreneurs have a better mental framework for opportunity identification and skills. However, this does not explain the cognitive differences among serial entrepreneurs in different age groups. When entrepreneurs repeat start-up activity and become habitual or serial entrepreneurs, we need to know how age related cognitive development modifies the influence of opportunity identification and skills in serial entrepreneurship. Theories in psychology argue that age related cognitive decline becomes insignificant in the case of repeated activities (Bjork & Bjork, 1992). In this context, the present study addresses the question of how age modifies opportunity identification and skills in the early start up stage, in serial entrepreneurship. We draw on cognitive psychology theories including life span cognitive development theory.

## 2.2 THEORETICAL BACKGROUND:

Age is a multidimensional concept that can be interpreted in chronological, biological or psychological terms. Chronological age refers to the number of years since the date of birth of the individual. Biological age is based on an estimation of the individual's potential life span and involves measuring the vitality or neurobiological health of an individual. Psychological or cognitive age refers to the individual's ability to adapt to changing environmental demands (Stuart-Hamilton, 2012). Individuals respond to their environment according to their learning, memory, intelligence, emotional control, motivational strengths and so on. Among the three concepts of age, chronological age is only a rough index of

psychological (cognitive) or biological development (Hoyer & Roodin, 2009). Cognitive psychology deals with mental processes such as memory, language, processing speed, reasoning, decision making, etc. Scientific evidence indicates that, on the one hand, mental processes become less efficient as people age, but on the other, that experience based on older age can help to solve the complex moral and social problems (Baltes & Staudinger, 1993). These differences in cognitive conditions of age are discussed in lifespan cognitive psychology.

According to life span psychology, there are three orientations of individuals during their life cycle. These are growth orientation at a young age, maintenance orientation in middle age, and prevention orientation in old age (Craik & Bialystok, 2006). Young age is characterised by biological agility in acquisition and development for future growth. At this stage, young people are interested in acquiring knowledge, skills and opportunities with agility. Adaption to change is another characteristic of this stage, and the response to environmental stimuli (e.g. a business opportunity) will be the quickest in young age. Middle age refers to the process that ensures stability of functional levels. It means that people will be less responsive in middle age to environmental or professional drivers compared to young age. In old age, people remain 'loss prevention oriented', or avoid negative and undesired life changes (Baltes, 1987; Heckhausen et al.1989; Freund & Baltes, 2000, Ebner et al., 2006). Because of differences in cognitive goal orientation in the three lifespan cognitive stages, the decisions of individuals in the same environmental context, to be involved in entrepreneurial activity or entrepreneurial behaviour, will differ. The influences of these three orientations of cognitive condition are discussed to explain their influence on opportunity identification and entrepreneurial skills.

### 2.2.1 Information processing speed and age

Human intelligence can be categorised as fluid intelligence or crystallised intelligence. Fluid intelligence is the ability to solve novel problems; crystallised intelligence refers to the individual's pre-existing knowledge. Fluid intelligence involves inductive reasoning, spatial reasoning, perceptual speed and numeric ability. Crystallised intelligence includes verbal ability and verbal memory (Schaie, 2005), which includes such concepts as vocabularies, definitions, statements, etc. It is widely accepted that fluid intelligence declines in later life and crystallised intelligence either increases or remains stable throughout life (Horn & Cattel, 1967; Rabbitt, 2004; Schaie, 2008; Salthouse, 2009; Verhaeghen, 2011). Changes in the individual's fluid intelligence affect his/her reaction time. Reaction time is the time taken to respond to a stimulus. It is the time the individual takes to respond to the stimulus after the stimulus is first apparent to him or her. It is well known that reaction time slows as people age (Stuart-Hamilton, 2012). There are two reasons for this. First, older people's nervous systems are slower and less efficient at conducting signals. With growing age, people store more information in their memory. This additional information needs extra time to be processed. Second, old people are in a disadvantageous condition in relation to processing extra choices in their life courses. These extra choices slow the response of old people. In a meta-analysis of 172 studies, Sheppard and Vernon (2008) found that processing speed and cognitive ability are reliably and significantly correlated. Since processing speed declines with growing age, the cognitive ability of individuals declines with growing age. Opportunity identification requires the processing of information to understand the market anomalies. So, at old age, slower information processing speed and declining cognitive ability will reduce effective opportunity identification.

In a review of the literature on venture creation, Baron (2007) identifies three key tasks in the venture creation process: 1) generating ideas for new venture creation; 2) recognising opportunities related to these ideas; and 3) obtaining the resources needed to develop these ideas by launching a new venture. In a search for the factors responsible for generating ideas and opportunities, Baron (2007) argues that concepts play a key role in generating ideas, and that pattern recognition plays a primary role in opportunity recognition. However, for several reasons, concepts and pattern recognition are not sufficient to generate ideas and to recognise opportunities (Bygrsbr & Zacharakis, 2008; Mariotti & Glackin, 2012; Stoke et al., 2010). Firstly, a business idea can be treated as an opportunity if it meets certain criteria: it needs to be executable, profitable and sustainable. If these criteria are met, we consider the business idea an opportunity. Secondly, pattern recognition is the core of a business idea, not a step towards opportunity identification. For example, a demographic change in the population (a change in the birth rate) will provide some business ideas to potential or existing entrepreneurs. Comparative analysis of the potential business ideas based on the above three criteria will help recognition of an opportunity. Thirdly, concepts on their own are not sufficient to generate a business idea. Concepts are part of the individual's verbal ability and verbal memory (Hoyer & Roodin, 2009) which are components of crystallised intelligence. On the other hand, inductive reasoning, spatial reasoning and perceptual speed are also required to generate ideas and these are components of fluid intelligence which declines with age. A potential entrepreneur needs both types of intelligence to recognise an opportunity.

Entrepreneurs primarily evaluate and compare the ideas heuristically to identify potential business opportunities (Baron, 2004). To do so they depend on their cognitive ability and information processing speed. As per the discussion above, age is a critical factor in

intelligence and information processing speed. Old people take longer to process information and use simpler, less cognitively demanding strategies (Mata et al., 2007). Their age related cognitive decline (decline in fluid intelligence) leads them to choose a simpler strategy. Since fluid intelligence declines and information processing speed becomes slower in old age, the impact of opportunity identification in early stage entrepreneurial activity will also decline in old age. Thus, we hypothesize that:

***Hypothesis 1: The influence of opportunity identification on early stage entrepreneurial activity will be moderated by the age group of the individual, such that opportunity identification will have a more positive influence on early stage entrepreneurial activity if the opportunity is identified by a young adult rather than a middle aged or old aged (late adult) individual.***

2.2.1.1 Entrepreneurial experience, opportunity identification and age:

Previous entrepreneurship studies suggest that the influence of entrepreneurial experience on opportunity identification is significant (Gruber et al., 2010; Ucbasaran et al., 2009; 2010; Dimov, 2007; Rerup, 2005; Shepherd & DeTienne, 2005). Ucbasaran et al., (2003) argue that prior business ownership experience affects the habitual entrepreneur's mindset and knowledge base to identify and explore business opportunity. They find that habitual or serial entrepreneurs identify almost twice as many opportunities as early stage (novice) entrepreneurs in the same time. A habitual entrepreneur is an entrepreneur with experience of more than one entrepreneurial start-up. An entrepreneur that starts businesses one after the other is described as a serial entrepreneur. An entrepreneur who starts/inherits/purchases and retains ownership of several business simultaneously is

described as a portfolio entrepreneur (Parker, 2013; Plehn-Dujowich, 2010; Ucbasaran et al., 2008; Westhead et al., 2005; Westhead & Wright, 1998; MacMillan, 1986). To explain how experience influences opportunity identification, Gaglio and Katz (2001) argue that a complex schema characterised by cross links to other schemata helps experienced entrepreneurs, compared to others, to see pattern development and to detect market anomalies. Schemata are dynamic, evolving, mental models that guide individuals in their information processing and reasoning. Chronic complex schema are habitually activated automatically to guide the individual in a particular situation (Fiske & Taylor, 1991). This automatic activation helps to reduce information processing time even in a complex situation. In entrepreneurship, prior continual start-up experience helps serial entrepreneurs to activate their opportunity searching schema to find market anomalies in ambiguous situations regardless of information load (Gaglio & Katz, 2001; Bargh, 1989). They can identify a pattern in seemingly unrelated areas in more meaningful ways than inexperienced entrepreneurs (Baron & Ensley, 2006). This pattern recognition ability helps them to identify opportunities before others. McGrath and MacMillan (2000) show that habitual entrepreneurs have a unique entrepreneurial mind-set that prompts them to search for opportunities, and to purse only the best opportunity. So, entrepreneurial experience with growing age allows serial or portfolio entrepreneurs to develop a mental framework (schema) to identify more executable opportunities.

In a psychological analysis, Salthouse (1985) finds no differences in typing speed between younger adults and older typists. Typing is a psychomotor performance and the analysis shows that, although younger typists are more agile, older typist plan longer sequences of finger movements than younger typists. In another study of novice and experienced typists, Charness et al. (2001) find that young adult novice typists learn faster and retain

information better than other age groups of novice typist. However, among the experienced participants, older people learn faster than other age groups. Experience in the same field, compensates for physical decline. Experience and training in later life can compensate for age related cognitive decline (Linderberger et al., 2008). Serial start-up experience helps to accumulate domain specific knowledge in entrepreneurship. Accumulated domain-specific knowledge enhances performance and makes the performance less demanding on processing resources even when individuals are suffering from cognitive or other impairments (Hoyer & Roodin, 2009) due to age related decline. This habitual functioning in the old age group helps the identification of opportunities and ensures more influence of opportunities in serial start-up activity, than in other age groups. We hypothesize that:

***Hypothesis 2: The influence of opportunity identification on serial entrepreneurial activity will be moderated by the age group of the individual, such that opportunity identification will have a more positive influence on serial entrepreneurial activity if the opportunity is identified by an older aged (late adult) entrepreneur rather than a young adult or middle aged entrepreneur.***

### 2.2.2 Use of Skills and Age

It is widely accepted that human capital or skill is an important construct in entrepreneurship. There are two kinds of skills in psychological analysis (Rogers, 1996): task specific skills and stimulus specific skills. Task specific skills are the general skills related to the process of a task. For example, general knowledge on starting and running a business are task specific skills. Stimulus specific skills include skills related to completing

a particular piece of work or stimuli. When starting a business, stimulus specific skills are the skills related to starting a specific type of business. Here, the new business opportunity might be a stimulus. So, the skill related to starting a business to purse a specific opportunity is a stimulus specific skill. Studies show that there are no age related significant differences in task specific skills (Fisk et al., 1994; Fisk & Hodge, 1992). However, in stimuli specific skills, there is a significant difference between young adult and old people. Young adults show greater retention of stimulus-specific information (Rogers, 1996) in Rogers et al.). This suggests that young adults have a higher level of the skills necessary to start a business. After recognising an opportunity, the potential entrepreneur needs to manage resources and complete the legal process involved in setting up a business. It can be expected that the business start-up skills of young adults will be modified by their age and experience of starting a business. This situation is explained by disuse theory.

In psychology, disuse theory claims that if individual skills are unused they will decline. This decline is related to age (Stuart-Hamilton, 2012). Disuse theory emerged from Thorndike's (1914) law of disuse. Thorndike stated that: 'When a modifiable connection is not made between a situation and a response during a length of time that connection's strength is decreased'. This law implies that disuse results in forgetting over time. In explaining his theory, Thorndike (1913) stated that: 'To the situation, 'a modifiable connection not being made by him between a situation S and a response R, during a length of time T,' man responds originally, other things being equal, by a decrease in the strength of that connection'. Based on this explanation this theory can be considered a main explanatory condition of forgetting. However, McGeoch (1932) argued that disuse is a contributing factor to forgetting. He suggests that although disuse and forgetting are

correlated, there is no evidence that disuse causes forgetting. Subsequent studies discredit the disuse theory for its failure to accommodate the intervening factors of forgetting.

Based on the above and subsequent work, Bjork and Bjork (1992) proposed the 'new theory of disuse' which takes account of intervening factors. Based on the original theory of disuse, the new theory suggests that the information (here, skills) in the memory may at some point in time become non-recallable with disuse, regardless of how accessible and over learned. In contrast to the original theory, the new theory argues that human memory has unlimited storage capacity, and information can remain in the memory for an indefinitely long period. However, the system of information retrieval is highly erratic and cue dependent. In the human memory, information that is retrieved from the memory becomes more retrievable in the future, and other information becomes less retrievable. A huge body of empirical research (see Bjork & Bjork, 1992 pp. 37 for a list) endorses the above positive and negative assertions. This cue dependent retrieval aspect of disuse suggests that an item in the memory will become inaccessible if not retrieved periodically, even if it has been well learned. The gradual loss of retrieval access is not a consequence just of the passage of time, but rather is a consequence of the learning and practice of the other items. When we update our memory representation by learning a new skill the new representation will be the most accessible at the end of the learning process. With disuse of both representations there will be loss of access to the most recent representation and a recovery of access to earlier representations in the human memory.

The human memory retains the individual's skill information. Following the retrieval principle of disuse theory, we can discuss skill retrieval from two perspectives: whether the

entrepreneur is in the early start-up stage or is a serial entrepreneur. Skill and serial entrepreneurship are discussed in the next section. As per disuse theory, the influence of skill for these two groups of people will not be the same. In young age business start-up skills will be more retrievable than in old age entrepreneurial early start-up stages. People in the old age will have more intervening skills than business start-up skills. Throughout their professional lives, people will gain different business and non-business related skills from working in different business and non-business organisations. These non-business start-up skills are the skills intervening in business start-up skills. As a result, in old age, business start-up skills will be less retrievable than the other professional skills. There will be a gradual loss of retrieval access to business start-up skills with growing age for non-entrepreneurs who are trying to start a first business. Thus, we hypothesize that:

***Hypothesis 3: The influence of skill on early stage entrepreneurial activity will be moderated by the individual's age group, such that skill will have a more positive influence on early stage entrepreneurial activity among young adults compared to middle aged or old aged (late adult) individuals.***

2.2.2.1 Entrepreneurial Experience, Skill and Age:

Several works suggest that serial entrepreneurs have high levels of general and entrepreneurial-specific skills (Amaral et al., 2011; Ucbasaran, 2008; Westhead et al., 2005). In serial entrepreneurship, business start-up skills will be more retrievable in late old age than in young adult or middle age because of periodic retrieval and immediate representation (Rabbitt, 1980). As a result, old age will have more influence on skill than the other two age groups in serial entrepreneurship. Young serial entrepreneurs have

fewer repeated skills than older serial entrepreneurs. Consequently, given the inherently dynamic nature of serial entrepreneurship (Amaral et al., 2011), the influence of skills in old age for serial entrepreneurs will be comparatively higher than the influence of skills for serial entrepreneurs at a young age. The principal assumption here, as already stated, is that old serial entrepreneurs have more habitual use of their entrepreneurial skills than young serial entrepreneurs. Thus, we hypothesize that:

***Hypothesis 4: The influence of skill on serial entrepreneurial activity will be moderated by the age group of the individual, such that skill will have more positive influence on serial entrepreneurial activity if the skill is possessed by an old age (late adult) entrepreneur rather than a young adult or middle aged entrepreneur.***

## 2.3 DATA AND METHOD

### 2.3.1 Method:

To test the hypotheses, we used logit regression analysis. We employ two series of logit regressions to analyse the interaction effect of age with opportunity and skill in early stage entrepreneurial activity and in serial start-up activity. We consider early stage entrepreneurial activity to analyse entrepreneurial behaviour for two reasons. First, early stage entrepreneurial activity includes the Global Entrepreneurship Monitor (GEM), categories of nascent entrepreneurship and new business owners without double counting. The stage covers businesses from 3 to 42 months. This period is important for business sustainability. Second, national nascent entrepreneurship rates are very low, which may generate biased significant results. Thus, we consider total early stage entrepreneurial activity rather than nascent entrepreneurship. Total early stage

entrepreneurial activity and serial start-up entrepreneurial activity are described in the dependent variable section 2.3.1 .1. We considered three age groups - 'young-adult' aged 18 to 35, and two older age groups aged 36 to 55 and 56-70. We check the sensitivity of the results by changing the definition of age groups, that is young-adult aged 18 to 30, and the two older age groups aged 31 to 50 and 51-70. A detail discussion of age groups is provided in Section 2.3.1.2, which presents the independent variables.

Each series of logit regression includes nine equations. In equation 1, we consider all the control and independent variables. Here. we consider the continuous variable age1870. In equation 2, we test the interaction of age1870 with opportunity. This is an interaction between a continuous and a dichotomous variable. In equations 3, 4 and 5, we interact opportunity with age1835, age5670, and age1835a respectively. These interactions are between two dichotomous variables. To test the interaction between age and skill we repeat equation 2 to 5 for the interactions between skill and age groups. So, equation 6 deals with the interaction between age1870 and skill. Equations 7, 8 and 9 deal with the interaction between skill and three dummies for age groups. The strategy for interpreting the interaction effects is later in this section.

2.3.1 .1 Dependent Variables:

Our dependent variables are 'Early-stage Entrepreneurial Activity' and 'Serial Start-up Entrepreneurial Activity'. For early stage entrepreneurial activity we use total entrepreneurial activity (TEA) from GEM, which is a variable that captures those individuals involved in entrepreneurial activity (start-up phase or managing), alone or with others, and owners of a business and paying salaries for less than 42 months. TEA is

calculated from the responses to three questions in a filtering process*:* 1) “are you, alone or with others, currently trying to start a new business independently of your work?”, 2) “are you, alone or with others, currently trying to start a new business as part of your work?”, and 3) “are you, alone or with others, currently the owner or manager of a business?” Those responding yes to all three questions were asked to filter the questions to ensure that they were actively engaged in the business start-up process as owners and managers, and establish how long they had been paying wages to employees. A distinction is made between nascent entrepreneurs (those whose businesses have been paying wages for 3 months or less) and new business owner-managers (who have been paying salaries for more than 3 but not more than 42 months). TEA is the proportion of nascent entrepreneurs and new business owner/managers (minus any double counting, i.e. those who respond positively to both are counted once) in the working age population.

The serial start-up entrepreneurial activity variable was constructed based on the GEM UK dataset, through a filtering process. The variable captures those who, alone or with others, have started a business that they owned and managed, before the one they are currently trying to start. The variable was based on responses to three questions in the GEM UK survey through a filtering process*:* 1) “are you, alone or with others, currently trying to start a new business independently of your work?”, 2) “are you, alone or with others, currently trying to start a new business as part of your work?”. Those who responded yes to these two questions were asked the following question to find serial start-up entrepreneurial activity: 3) “Have you, alone or with others, started a business that you owned and managed before this one?”, which captures serial start-up entrepreneurial activity. Serial start-up activity was estimated for years 2007, 2008 and 2010 of the GEM UK survey. In our study, we are interested primarily in testing how age modifies the influence of

opportunity recognition and skill in early stage entrepreneurial activity. We are interested also in testing how these influences change in the serial entrepreneurial start-up process. Here, both early stage entrepreneurial activity and serial start-up entrepreneurial activity are dichotomous variables.

2.3.1.2 Independent variables:

Age is one of the main variables of interest. We discuss how the age groups are defined before explaining the independent variables. In life span analysis, some studies use a 4-104 year age bracket (Baltes, 1987). However, we want to limit the analysis to the active working age population aged 18 to 70 which is in line with other age related studies in entrepreneurship (Kautonen et al., 2010; Bönte et al., 2009; Hart et al., 2004; Weber & Schaper, 2003). Hart et al. (2004) consider the 18-64 age group in their analysis. In this study, we extend this to 18-70 based on the growing tendency of people in the old age group to be involved in the start-up activity after the formal retirement age (Ilmarinen, 2001). In the UK, retirement age is 65. So, we can expect that some people might try to start a new business up to the age of 70 following Ilmarinen's argument that people may try to start a business after retirement age. However, there is age related sharp physical decline after the age of 70 (Stuart-Hamilton, 2012). Therefore, we limit our analysis to the 18-70 age group (age1870).

There is no agreed definition of the age limits for different age groups. Young adults have been defined variously: Blanchflower and Oswald (2007) define young adult age as 16 to 25; Ahn (2010) defines it as 22 to 39; Llisterri et al. (2006) define it as 16 to 24; and Sobel

and King (2008) define young adult age as 16 to 30. We draw a middle line on both Ahn (2010) and Sobel and King (2008). The study by Ahn (2010) is a psychological study and Sobel and King (2008) study entrepreneurship. We define young adults as aged 18-35. Regarding middle age and old age, the definitions are similarly various and based on the total age span in the analyses. For example, Heckhausen et al. (1989) define middle age as 40-55 and older adult as 60-85 years. Blates and Lindenberger (1997) differentiate between older adults of 70-101 and younger adults aged 25-69. However, entrepreneurship scholars define third age or older age as between 50 and 64 (Hart et al., 2004; Kautonen et al., 2010). Since our interest is limited to individuals aged 18-70, we defined 56-70 as old aged, adding six years to the upper and lower limits in Hart et al.'s (2004) definition. Similarly, we define 36-55 as middle age and 18-35 as young adult. We expect these age groupings to give a better understanding since the age limit for young adult is more than 30 years which is in line with psychological characteristics. However, we conduct a sensitivity analysis using the age band 18-30 for young adult, 31-50 for middle age, and 51-70 for old age in line with earlier studies.

We are interested in the relationships among the variables for opportunity identification, skill and age1870. Opportunity identification and skill are dichotomous variables; age1870 is a continuous variable. This refers to the exact age of the respondent at the time of the survey. To analyse the pattern of influence of age on the dependent variables we generate age1870 square, a variable that explains the quadratic relationship. To explain the specific effect of each age group, we generate three dummy variables for the three age groups – young adult, middle age, and old age group. The first variable age1835 represents young adults. We considered age1835=1 for age 18 to 35 and age1835=0 for ages 36 to 70. This variable explains the likelihood of young adults compared to the other two age groups. The

second variable age5670 compares old people with the two younger groups: age5670=1 if the respondent's age is between 56 and 70 and age5670=0 if the respondent's age is between 18 and 55. To test the influence of young adult over middle age we created the dummy variable age1835a. We consider age1835a=1 if the age range is between 18 and 35 and age1835a=0 if the age range is between 36 and 55.

To analyse the sensitivity of age groups, we redefined three age related dummy variables and generated three additional dummy variables. The variables are: age1830=1 if respondents are young adult (aged 18-30) and age1830=0 for the remaining respondents, age5170=1 if respondents are old (aged 51-70) and age5170=0 for the remaining respondents. For young adult over middle age the dummy variable is age1830a=1 if the age range is 18 to 30, and age1830a=0 if the age range is 31 to 50.

2.3.1.3 Control Variables:

We control for demographic, cognitive and other non-cognitive variables. The demographic variables are: male (gender), white (ethnicity), and immigrant. Cognitive and other non-cognitive variables are: fear of failure, graduate (education), employment, discontinue a business, England (region). The responses to all the variables are dichotomous. Among the demographic variables, the response for male is 1 and for female is zero; white is 1 and all non-white is zero; the response for immigrant is 1 and non-immigrant is zero. The cognitive variable fear of failure is literally opposite to the self-efficacy (Bandura, 2002) or perceived behavioural control (Ajzen, 1991) variable. In self efficacy or perceived behavioural control we measure the impact of perception of success on behaviour. However, fear of failure measures the impact of perceived fear to prevent start-up. Among

the other non-cognitive variables, if the respondent completed degree level or higher education the response is 1 otherwise the response is zero; If the respondent worked either fulltime or part-time the response for employment is 1 and if not, the response is zero; if the respondent discontinued or shutdown a business in the previous 12 months the response is 1, otherwise the response is zero; if the respondent is living in England the response is 1 and if the respondent is living in any of the three other UK regions the response is zero; .

2.3.1.4 Interaction Effects:

Interaction effects evaluate the effect that a change in one independent variable has on the effect of a change in another independent variable, on the dependent variable. In our study, the independent variables 'age1870' 'age1835', 'age5670' and 'age1835a' are interacted with skill and opportunity to determine whether there is any age difference in the magnitude of the effects of opportunity and skill on either early stage entrepreneurial activity or serial entrepreneurial activity. Ai and Norton (2003) found that most applied research published in leading journals incorrectly interpret the coefficient of the interaction terms in nonlinear models. Interaction terms are widely used in the social sciences. Researchers wrongly interpret the marginal effects of the interaction terms instead of the interaction effects of interaction. Ai and Norton (2003, p. 129) argued that 'Interaction *effects cannot be evaluated simply by looking at the sign, magnitude, or statistical significance of the coefficient on the interaction term when the model is nonlinear. ... It can have different signs for different observation, making simple summary measures of the interaction effect difficult'.* Interaction terms require calculation of the cross derivative or cross difference. Norton et al. (2004) explained the interaction effect of different combinations of the continuous and discrete variables. When both the interacted variables

x1 and x2 in a nonlinear function (here in a logit model) are continuous, the interaction effect is the cross derivative with respect to x1 and x2. The interaction effects of two dummy variables are the discrete double difference. The interaction effect of one continuous variable and one dummy variable is the discrete difference (with respect to x2) of the single derivative (with respect to x1). Norton et al. (2004), in their analysis, proposed three formulae for a single interaction for same independent variable.

Though Norton et al. (2004) identified the discrepancy in the interaction effects analysis they do not accommodate that the interaction effects direction of interaction affect based on the value label of the independent variable gives a mean interaction effect result. So, we can only get an average understanding using their formulae, since they do not say anything about which values of the independent variable cause the specific interaction result. Consequently, our understanding of interaction effects needs more analysis. There are two other ways to analyse interaction effects. These are margin analysis and marginal effect analysis using cross derivatives. The latter is also called interaction effect analysis (Buis, 2010). In our interaction, we first interacted the continuous variable age1870 with the two other dichotomous independent variables. Second, we interacted the independent variables with the respective dummy variables for age groups age1835, age5670, and age1835a.

2.3.2 Data:

We use GEM UK adult population survey data. Among the existing data sets, GEM data provide the most variables for demographic and cognitive analysis of entrepreneurial activity. The available GEM UK survey data are collected every year since 2002. We use the GEM UK 2002-2010 pooled dataset (the latest available data set at the time of the

analysis). Other available data sources are the Panel Study of Entrepreneurial Dynamics (PSED) and Panel Study of Income dynamics (PSID) in the USA, the British Household Panel survey (BHPS), EURO Barometer statistics or Comparative Entrepreneurship Data for International Analysis (COMPENDIA). However, these datasets do not provide sufficient cognitive variables for necessary analysis.

The PSED dataset provides data on the business formation process. There are two phases in PSED - PSED I and PSED II. PSED I includes three follow-up interviews and PSED II includes six follow-up interviews. The variables covered in the PSED datasets are entrepreneurial activity, demographic variables and income variables. There is no attitudinal variable in the PSED datasets. So, PSED data do not allow us to test our hypotheses. The COMPENDIA dataset covers business ownership and labour force characteristics variables, but does not provide information on business start-up, skill and opportunity identification. Like the COMPENDIA dataset, the PSID dataset also does not provide information on skills and opportunity identification. The PSID dataset covers occupation, demographic, family composition and child development related data. Similarly, BHPS covers household data related to income, wealth, expenditure, etc. Unfortunately, none of these datasets provides data on business start-up, start-up skill, opportunity identification, and age. So, in this study we used GEM UK data.

GEM data covers demographic, attitudinal, business environmental, and business practice variables. Since GEM UK survey is conducted through random telephone (fixed line and mobile) interviews, it does not suffer from selection bias. The GEM UK dataset includes six attitudinal variables with necessary demographic, biological and social data. We restrict our analysis to individuals aged 18-70 years and the total number of useable observations

in our samples is 86,670. GEM UK identifies serial entrepreneurs in the year 2007, 2008 and 2010. The total number of useable observations for serial entrepreneurship for the age range 18-70 is 1,373.

In life span cognitive analysis both cross-sectional and longitudinal data were used. The results show that there are significant differences between two types of data. Salthouse (2009) found that there is a discrepant age trend in cognitive performance from 18 to 60 years of age between cross sectional data and longitudinal data. The main point of argument among the studies based on the two types of data is when the age related cognitive decline starts. Some find cognitive decline starting late in life. Ronnlund et al (2005) suggested that it begins at age 55; Albert and Heaton (1988) found that there is little cognitive decline until age 50. Schaie (1989) stated that *"…..most abilities tend to peak in early midlife, plateau until the late fifties or sixties, and then show decline, initially at a slow pace, but accelerating as the late seventies are reached".* In contrast, Salthouse (2009) argued that there are many abilities which begin to decline from the age of 20. Salthouse uses longitudinal data in his study. In response, Schaie (2009) argued that there is cohort effect of age which must be controlled for when using longitudinal data. He argues that age changes within individuals over time, can be inferred from cross-sectional age differences between groups of individuals. The process has been conducted successfully in last 40 years. Based on the above, we used GEM UK pooled data which are cross sectional.

The data allowed us to analyse the cognitive response of different age groups at a point of time. It is not an analysis of the responses of an individual over the life span. Since we are only interested in a general understanding from life span analysis of entrepreneurial

intention and the behaviour of different age groups at a point of time, we use GEM data. However, this does not allow us to analyse cognitive change and its impact on the responses to entrepreneurial behaviour. Overall, it provides some understanding of the cognitive responses of age groups, based on lifespan theory, at a point of time.

2.3.2.1 Descriptive Statistics:

The correlation matrix for early stage entrepreneurial activity in presented in Table-2.1 and shows that there is no multi-collinearity problem among the variables. Though the magnitude of correlations between entrepreneurial activity and all the other variables is small, the level of significance of the correlations between entrepreneurial activity and all other variables is high. Descriptive statistics show that 5.1% of respondents are entrepreneurially active in the start-up process. The demographic characteristics of the respondents are: a) average age 45 years with 13 years standard deviation, b) 42% respondents are male, c) 95% are white, and d) 7% are immigrant.

Other cognitive and non-cognitive characteristics are: 31% of the respondents could identify opportunity and 47% perceived that they had sufficient skill to start a business. Twenty-eight per cent of respondents had completed first degree or higher level of education and 24% of respondents knew an entrepreneur who had started a business in the previous two years; 70% of respondents are in full time or part-time employment; 35% said that fear of failure would prevent them from starting a business, and 63% declared that they lived in England.

Table-2.1: Descriptive Statistics and Correlation Matrix for Early Stage Entrepreneurial Activity

| SL No | Variable | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Entrepreneurial Activity | 0.051 | 0.220 | | | | | | | | | | | | |
| 2 | Age1870 | 45.25 | 13.39 | -0.06* | | | | | | | | | | | |
| 3 | Male | 0.423 | 0.494 | 0.08* | 0.02* | | | | | | | | | | |
| 4 | Opportunity | 0.308 | 0.462 | 0.15* | -0.09* | 0.09* | | | | | | | | | |
| 5 | Skill | 0.473 | 0.499 | 0.19* | -0.01 | 0.20* | 0.20* | | | | | | | | |
| 6 | White | 0.953 | 0.211 | -0.03* | 0.15* | -0.01* | -0.03* | -0.02* | | | | | | | |
| 7 | England | 0.629 | 0.483 | 0.01* | 0.03* | 0.01* | 0.02* | 0.02* | -0.10* | | | | | | |
| 8 | Immigrant | 0.067 | 0.249 | 0.02* | -0.09* | 0.01* | 0.04* | 0.03* | -0.46* | 0.07* | | | | | |
| 9 | Graduate | 0.281 | 0.450 | 0.06* | -0.11* | 0.04* | 0.13* | 0.14* | -0.08* | -0.002 | 0.12* | | | | |
| 10 | Employment | 0.699 | 0.459 | 0.12* | -0.30* | 0.08* | 0.11* | 0.17* | -0.01* | 0.001 | 0.02* | 0.17* | | | |
| 11 | Discontinue | 0.020 | 0.138 | 0.09* | 0.01* | 0.05* | 0.04* | 0.11* | -0.01* | 0.01* | 0.02* | 0.03* | 0.001 | | |
| 12 | Fear of Failure | 0.349 | 0.477 | -0.07* | -0.10* | -0.05* | -0.02* | -0.13* | -0.001 | -0.03* | -0.001 | 0.03* | 0.08** | -0.03* | |
| 13 | Network | 0.237 | 0.425 | 0.15* | -0.15* | 0.09* | 0.24* | 0.21* | -0.04* | -0.01* | .04* | 0.14* | 0.14* | 0.08* | -0.01 |

* p<0.01

For serial entrepreneurship (Table-2.2) there is no problem of multicollinearity among the variables. Discontinuity, age, and skill have moderate correlation with serial entrepreneurship. The correlation between serial entrepreneurship and the remaining variables is weak. The descriptive statistics show that 31% of respondents are serial entrepreneurs. The demographic characteristics of respondents are: a) average age 43 years, b) 60% are male, c) 93% are white, d) 64% live in England, and e) 10% are immigrants.

Cognitive and other non-cognitive characteristics of the respondents show that: a) 61% had identified opportunity in the previous six months; b) 84% perceived that they had sufficient skill to start a business; c) 23% stated that fear of failure would prevent them from starting a business; d) 7% had discontinued a business in the previous 12 months; e) 53% knew a businessman who had started a business in the previous two years; f) 42% had completed degree level or higher education; and g) 85% of respondents were employed either full time or part time.

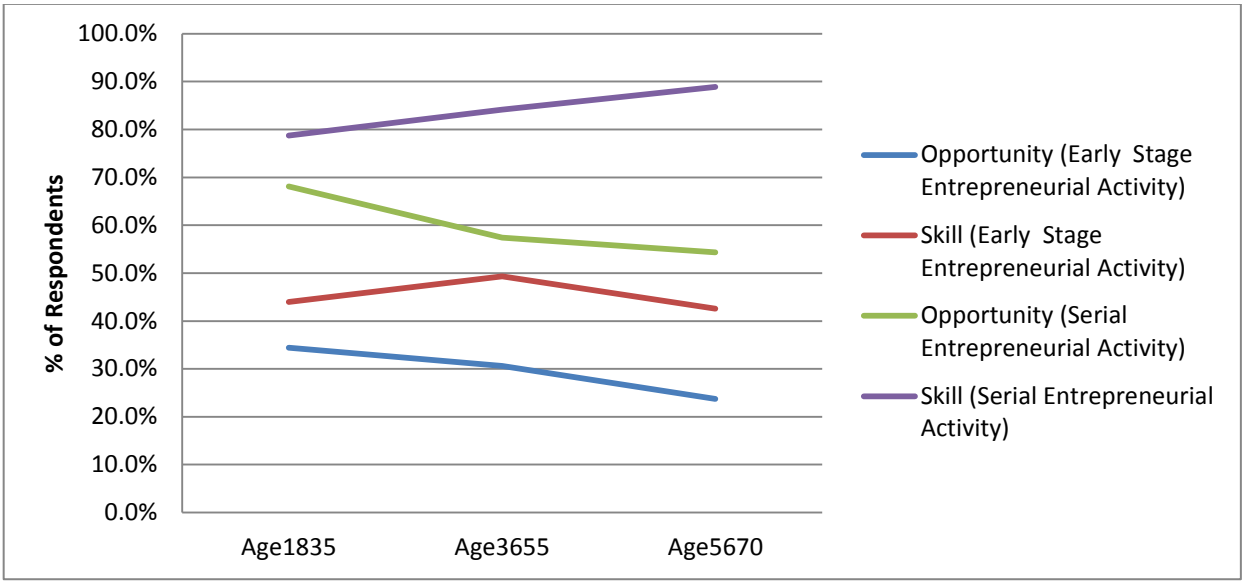
Table-2.2: Descriptive Statistics and Correlation Matrix for Serial Entrepreneurship

| SL NO | Variable | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Serial Entrepreneurship | 0.31 | 0.46 | - | | | | | | | | | | | |
| 2 | Age1870 | 42.50 | 11.40 | 0.20** | | | | | | | | | | | |
| 3 | Male | 0.60 | 0.49 | 0.09** | 0.02** | | | | | | | | | | |
| 4 | Opportunity | 0.61 | 0.49 | -0.01 | -0.09** | 0.09** | | | | | | | | | |
| 5 | Skill | 0.84 | 0.37 | 0.19** | -0.01 | 0.20** | 0.20** | | | | | | | | |
| 6 | White | 0.93 | 0.25 | 0.01 | 0.15** | -0.01** | -0.03** | -0.02** | | | | | | | |
| 7 | England | 0.64 | 0.48 | 0.03 | 0.03** | 0.01** | 0.02** | 0.02** | -0.10** | | | | | | |
| 8 | Immigrant | 0.10 | 0.30 | 0.04* | -0.09** | 0.01** | 0.04** | 0.03** | -0.46** | 0.07** | | | | | |
| 9 | Graduate | 0.42 | 0.49 | 0.03 | -0.11** | 0.04** | 0.13** | 0.14** | -0.08** | -0.002 | 0.12** | | | | |
| 10 | Employment | 0.85 | 0.36 | 0.04* | -0.30** | 0.08** | 0.11** | 0.17** | -0.001* | 0.001 | 0.02** | 0.17** | | | |
| 11 | Discontinue | 0.07 | 0.26 | 0.24** | 0.01** | 0.05** | 0.04** | 0.11** | -0.01** | 0.01** | 0.02** | 0.03** | 0.001 | | |
| 12 | Fear of Failure | 0.23 | 0.42 | -0.06** | -0.10** | -0.05** | -0.02** | -0.13** | -0.001 | -0.03** | -0.001 | 0.03** | 0.08** | -0.03** | |
| 13 | Network | 0.53 | 0.50 | 0.07* | -0.15* | 0.09* | 0.24* | 0.21* | -0.04* | -0.01* | 0.04* | 0.13* | 0.14* | 0.08* | -0.001 |

** p<0.01, * p<0.05

To understand the characteristics of independent variables more precisely the distribution of independent variables for the models is depicted in Figure 2.1.

Figure-2.1: Opportunity Identification and Skill of Different Age Groups in Early Stage and in Serial Entrepreneurial Activity:




The vertical axis in Figure 2.1 shows the percentage of total respondents and the horizontal axis shows the age groups. Almost 80% of young adults in serial entrepreneurship study perceived that they had sufficient skill to start a business. This rate increases with age. In early stage entrepreneurial activity, 44% of young adults perceived that they had sufficient skill. This rate grows with increasing age up to middle age after which the rate declines. In serial entrepreneurship, almost 70% respondents identified opportunities. This rate declines with growing age. We see a similar trend for opportunity identification in early stage entrepreneurial activity. Almost 35% of the young adults who identified opportunity were involved in early stage entrepreneurial activity. This rate falls to 24% in old age. These descriptive statistics of skill and opportunity by age groups are congruent with the cognitive characteristics of the age groups discussed in the theoretical part of this study. However, the continuous declining trend in opportunity identification with

growing age in serial entrepreneurship is somewhat of an exception to their cognitive condition.

2.3.2.2 Selection bias and serial entrepreneurship:

Sample selection bias refers to the problem of a dependent variable observed for a restricted number of non-random samples. This is a specification error. Heckman (1979) argues that there are two reasons for selection bias problems. First, there may be self-selection by the individuals or data units being analysed. Second, sample selection decisions by analysts or data processors operate in much the same fashion as self-selection. By definition, serial entrepreneurs have previous start-up experience. Identifying serial entrepreneurs requires identification of entrepreneurs with previous start-up experience. This analysis process may create possible selection bias problems (Winship & Mere, 1992).

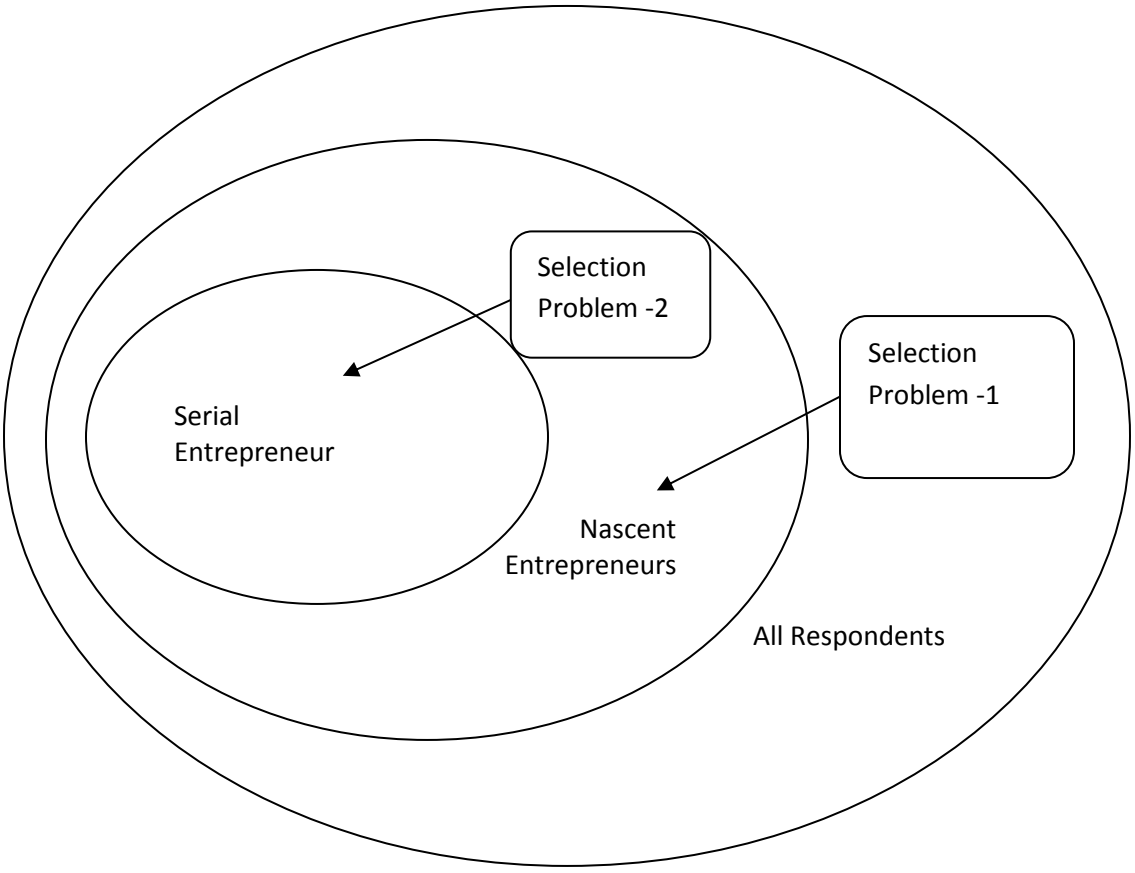
The process of identifying samples of serial entrepreneurs creates potential sample selection bias. In this study, serial entrepreneurs were identified through a screening process. First, GEM UK conducted a survey among the randomly selected working age individuals to select nascent entrepreneurs. After identifying the nascent entrepreneurs they selected serial entrepreneurs by asking a question if the respondent has, alone or with others, started a business that he owned and managed before this one.

The above process of generating serial entrepreneurs has created selection bias problem in two stages. Capturing nascent entrepreneurs from all working age population creates a selection bias problem, which we refer to as selection problem 1 in Figure 2.1.1. Capturing

serial entrepreneurs among nascent entrepreneurs through screening question created further selection bias problems. In Figure 2.1.1 this is referred to selection problem 2.

The data selection problems are depicted in Figure 2.1.1.

Figure 2.1.1: Sample Selection problem in Serial Entrepreneurship




The technique commonly used to test and correct for selection bias is the Heckman (1979) two step technique. The key feature of the model is that the error terms in the two equations are distributed bivariate normal (Bushway et al., 2007). If there is any significant correlation between the error terms in the selection equation and the outcome equation,

we can confirm a selection bias problem. As per the Heckman technique, two equations – selection and outcome equation - have to be developed based on the assumption of selection bias. Accordingly, the selection equation should contain at least one variable that is not in the outcome as per the assumption.

Heckman's selection model deals with a selection problem in the data. However, in our data, we have two selection problems simultaneously which makes it more complex. This complexity limits us to using a selection model with the existing data. With the caveat of this data limitation, we continue our analyses. The results of the study are provided in the next section.

**2.4 RESULTS:**

In the first model (Table-2.3) we test the relationship between age and entrepreneurship. The results shows that the demographic variables, age, gender, ethnicity (white) influence early stage entrepreneurial activity highly significantly. The influence of immigrant status is insignificant in the start-up process. The coefficient (magnitude of influence) of skill is the highest among the all independent variables in model-1 in early stage entrepreneurial activity followed by discontinuity. Opportunity identification and employment have almost the same degree of influence on early stage entrepreneurial activity. The findings reveal that background factors (i.e. age, gender, ethnicity, education, etc.) have significant direct influence on entrepreneurial activity. This result rejects Ajzen's (2002) assumption that an individual's background factors have an indirect influence on his or her behaviour.

Skill and opportunity are items of perceived behaviour control or self-efficacy (Moriano et al., 2012; Kolvereid & Isaksen, 2006). After running the interactions between actual age and skill and opportunity in model 2 (Table-2.3), we find that age remains highly significant. This confirms that age has both direct and indirect effects on entrepreneurship. The interactions of age1870 with opportunity and skills increase the direct effect of the other background variables in model-2 from model-1 (employment, discontinuity, white, graduate). The influence of male declines slightly after interaction. However, there is no change in the level of significance in models 1 and 2 in Table -2.3.

The equations for serial entrepreneurship are given in the Table-2.4. Interestingly, all the background variables are insignificant for serial entrepreneurship. Only the skill and discontinuity variables are highly significant in the model. However, we need to consider the potential selection bias problem in the serial entrepreneurship data mentioned in the section 2.3.2.3. The results in Table-2.4 show that after interacting age1870 with skill and opportunity, age1870 becomes highly significant. This shows a very strong indirect effect of age on serial entrepreneurship. This result supports the theory of planned behaviour that background factors have an indirect effect. However, it applies to serial entrepreneurship also described as habitual entrepreneurship. So, we can say that age has a direct impact on early stage entrepreneurship and an indirect effect on habitual entrepreneurship. As said earlier, to test our hypotheses, we need to calculate the interaction effects using the difference in difference method and margin analysis. These estimates are given in the remaining tables and figures in this section 2.4.

Table-2.3: Logit Regression of Early Stage Entrepreneurial Activity

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| age1870 | 0.0841*** | -0.00878*** | | | | -0.0122*** | | | |
| | (0.00972) | (0.00205) | | | | (0.00355) | | | |
| age1870sq | -0.00114*** | | | | | | | | |
| | (0.000113) | | | | | | | | |
| Male | 0.274*** | 0.250*** | 0.238*** | 0.259*** | 0.266*** | 0.250*** | 0.237*** | 0.258*** | 0.266*** |
| | (0.0335) | (0.0334) | (0.0334) | (0.0335) | (0.0360) | (0.0334) | (0.0334) | (0.0335) | (0.0360) |
| Graduate | 0.0926*** | 0.107*** | 0.106*** | 0.104*** | 0.0391 | 0.104*** | 0.103*** | 0.102*** | 0.0368 |
| | (0.0340) | (0.0340) | (0.0340) | (0.0340) | (0.0368) | (0.0340) | (0.0340) | (0.0340) | (0.0368) |
| Fear of Failure | -0.667*** | -0.647*** | -0.631*** | -0.653*** | -0.686*** | -0.647*** | -0.631*** | -0.653*** | -0.686*** |
| | (0.0408) | (0.0407) | (0.0407) | (0.0407) | (0.0433) | (0.0407) | (0.0407) | (0.0407) | (0.0433) |
| Employment | 0.812*** | 0.961*** | 1.031*** | 0.896*** | 0.605*** | 0.957*** | 1.030*** | 0.890*** | 0.606*** |
| | (0.0538) | (0.0523) | (0.0516) | (0.0532) | (0.0584) | (0.0523) | (0.0516) | (0.0532) | (0.0584) |
| Network | 0.634*** | 0.639*** | 0.664*** | 0.643*** | 0.632*** | 0.638*** | 0.662*** | 0.643*** | 0.631*** |
| | (0.0338) | (0.0338) | (0.0337) | (0.0337) | (0.0363) | (0.0338) | (0.0337) | (0.0337) | (0.0362) |
| Immigrant | 0.0465 | 0.0558 | 0.0560 | 0.0543 | 0.0734 | 0.0564 | 0.0576 | 0.0545 | 0.0749 |
| | (0.0643) | (0.0641) | (0.0644) | (0.0643) | (0.0674) | (0.0641) | (0.0643) | (0.0643) | (0.0674) |
| White | -0.264*** | -0.244*** | -0.303*** | -0.273*** | -0.250*** | -0.244*** | -0.300*** | -0.273*** | -0.248*** |
| | (0.0735) | (0.0734) | (0.0735) | (0.0731) | (0.0752) | (0.0733) | (0.0734) | (0.0730) | (0.0751) |
| England | 0.00539 | 0.00625 | -0.00109 | 0.00248 | 0.0151 | 0.00568 | -0.00179 | 0.00285 | 0.0142 |
| | (0.0343) | (0.0342) | (0.0342) | (0.0342) | (0.0370) | (0.0342) | (0.0342) | (0.0342) | (0.0370) |
| Discontinue | 0.992*** | 0.995*** | 0.981*** | 0.986*** | 0.951*** | 0.996*** | 0.980*** | 0.984*** | 0.950*** |
| | (0.0689) | (0.0687) | (0.0686) | (0.0688) | (0.0769) | (0.0687) | (0.0686) | (0.0687) | (0.0769) |
| Opportunity | 0.808*** | | | | | 0.813*** | 0.823*** | 0.816*** | 0.844*** |
| | (0.0338) | | | | | (0.0338) | (0.0337) | (0.0337) | (0.0366) |
| Skill | 1.745*** | 1.769*** | 1.755*** | 1.754*** | 1.736*** | | | | |
| | (0.0506) | (0.0506) | (0.0506) | (0.0506) | (0.0538) | | | | |
| 1.Opportunity | | 1.086*** | 0.765*** | 0.836*** | 0.775*** | | | | |
| | | (0.119) | (0.0399) | (0.0365) | (0.0449) | | | | |
| 1.Opportunity#c.Age1870 | | -0.00645** | | | | | | | |
| | | (0.00269) | | | | | | | |
| 1.Age1835 | | | 0.0259 | | | | 0.123 | | |
| | | | (0.0577) | | | | (0.0970) | | |
| 1.Opportunity#1.Age1835 | | | 0.198*** | | | | | | |
| | | | (0.0728) | | | | | | |
| 1.Age5670 | | | | -0.425*** | | | | -0.714*** | |
| | | | | (0.0685) | | | | (0.146) | |
| 1.Opportunity#1.Age5670 | | | | -0.129 | | | | | |
| | | | | (0.0924) | | | | | |
| 1.Age1835a | | | | | -0.0831 | | | | -0.0361 |
| | | | | | (0.0596) | | | | (0.100) |
| 1.Opportunity#1.Age1835a | | | | | 0.198*** | | | | |
| | | | | | (0.0754) | | | | |
| 1.Skill | | | | | | 1.780*** | 1.745*** | 1.723*** | 1.702*** |
| | | | | | | (0.164) | (0.0621) | (0.0536) | (0.0685) |
| 1.Skill#c.Age1870 | | | | | | -0.000273 | | | |
| | | | | | | (0.00381) | | | |
| 1.Skill#1.Age1835 | | | | | | | 0.0271 | | |
| | | | | | | | (0.104) | | |
| 1.Skill#1.Age5670 | | | | | | | | 0.246 | |
| | | | | | | | | (0.153) | |
| 1.Skill#1.Age1835a | | | | | | | | | 0.0857 |
| | | | | | | | | | (0.108) |
| Constant | -6.533*** | -4.974*** | -5.363*** | -5.184*** | -4.877*** | -4.821*** | -5.386*** | -5.139*** | -4.887*** |
| | (0.210) | (0.134) | (0.103) | (0.102) | (0.109) | (0.177) | (0.106) | (0.103) | (0.114) |
| Pseudo R2 | 0.1852 | 0.1824 | 0.1806 | 0.1832 | 0.1674 | 0.1822 | 0.1804 | 0.1832 | 0.1672 |
| Observations | 86,670 | 86,670 | 86,670 | 86,670 | 63,495 | 86,670 | 86,670 | 86,670 | 63,495 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

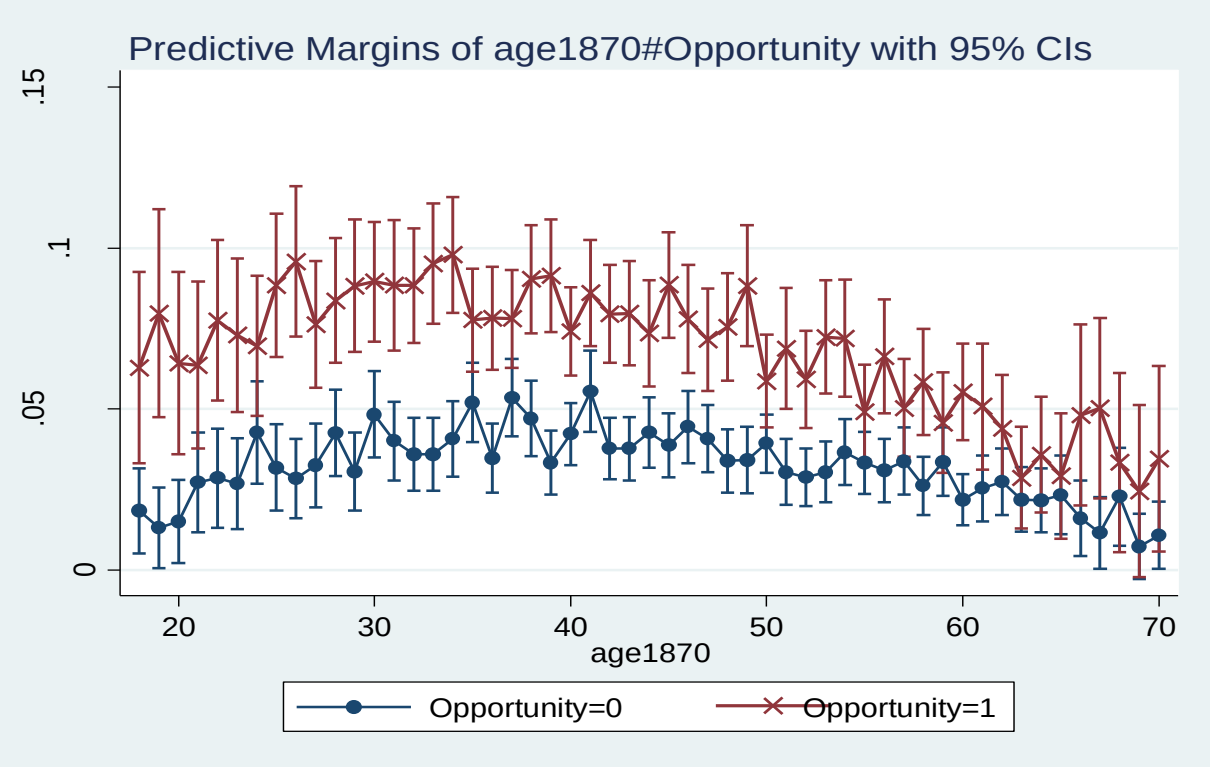
Table-2.4: Logit Regression of Serial Entrepreneurial Activity

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Age1870 | 0.0672 | 0.0431*** | | | | 0.0383** | | | |
| | (0.0411) | (0.00961) | | | | (0.0186) | | | |
| Age1870sq | -0.000296 | | | | | | | | |
| | (0.000467) | | | | | | | | |
| Male | 0.0969 | 0.0881 | 0.151 | 0.0880 | 0.0767 | 0.0882 | 0.150 | 0.0864 | 0.0757 |
| | (0.131) | (0.130) | (0.129) | (0.129) | (0.141) | (0.130) | (0.129) | (0.129) | (0.141) |
| Graduate | -0.00764 | -0.00452 | 0.0260 | 0.0214 | 0.144 | -0.00676 | 0.0268 | 0.0281 | 0.145 |
| | (0.130) | (0.130) | (0.128) | (0.128) | (0.141) | (0.130) | (0.128) | (0.128) | (0.141) |
| Fear of Failure | -0.196 | -0.192 | -0.196 | -0.176 | -0.191 | -0.193 | -0.196 | -0.175 | -0.190 |
| | (0.157) | (0.157) | (0.155) | (0.155) | (0.172) | (0.157) | (0.155) | (0.155) | (0.172) |
| Employment | 0.310 | 0.328* | 0.231 | 0.294 | 0.530** | 0.328* | 0.229 | 0.302 | 0.529** |
| | (0.191) | (0.189) | (0.185) | (0.186) | (0.229) | (0.189) | (0.185) | (0.186) | (0.229) |
| Network | 0.190 | 0.188 | 0.167 | 0.131 | 0.188 | 0.187 | 0.161 | 0.130 | 0.180 |
| | (0.129) | (0.129) | (0.128) | (0.127) | (0.141) | (0.129) | (0.128) | (0.127) | (0.141) |
| Immigrant | 0.330 | 0.326 | 0.329 | 0.279 | 0.334 | 0.328 | 0.329 | 0.276 | 0.333 |
| | (0.224) | (0.224) | (0.222) | (0.221) | (0.234) | (0.224) | (0.222) | (0.221) | (0.234) |
| White | -0.0369 | -0.0281 | 0.00116 | 0.114 | -0.179 | -0.0281 | 0.00620 | 0.116 | -0.172 |
| | (0.279) | (0.278) | (0.276) | (0.274) | (0.282) | (0.278) | (0.277) | (0.275) | (0.282) |
| England | 0.167 | 0.171 | 0.139 | 0.159 | 0.0884 | 0.171 | 0.138 | 0.160 | 0.0862 |
| | (0.132) | (0.132) | (0.130) | (0.130) | (0.144) | (0.132) | (0.130) | (0.130) | (0.144) |
| Discontinue | 1.688*** | 1.676*** | 1.711*** | 1.610*** | 1.518*** | 1.675*** | 1.709*** | 1.606*** | 1.509*** |
| | (0.240) | (0.239) | (0.237) | (0.234) | (0.263) | (0.239) | (0.237) | (0.234) | (0.263) |
| Opportunity | -0.00208 | | | | | -0.00343 | -0.0268 | -0.0757 | -0.0307 |
| | (0.130) | | | | | (0.130) | (0.128) | (0.128) | (0.142) |
| Skill | 1.219*** | 1.222*** | 1.229*** | 1.259*** | 1.293*** | | | | |
| | (0.229) | (0.229) | (0.228) | (0.228) | (0.255) | | | | |
| 1.Opportunity | | 0.120 | -0.0646 | -0.0949 | -0.0823 | | | | |
| | | (0.549) | (0.144) | (0.140) | (0.165) | | | | |
| 1.Opportunity#c.Age1870 | | -0.00276 | | | | | | | |
| | | (0.0119) | | | | | | | |
| 1.Age1835 | | | -0.922*** | | | | -0.862* | | |
| | | | (0.270) | | | | (0.501) | | |
| 1.Opportunity#1.Age1835 | | | 0.186 | | | | | | |
| | | | (0.322) | | | | | | |
| 1.Age5670 | | | | 0.662*** | | | | 1.184** | |
| | | | | (0.257) | | | | (0.548) | |
| 1.Opportunity#1.Age5670 | | | | 0.127 | | | | | |
| | | | | (0.336) | | | | | |
| 1.age18351 | | | | | -0.828*** | | | | -0.645 |
| | | | | | (0.278) | | | | (0.523) |
| 1.Opportunity#1.Age1835 | | | | | 0.207 | | | | |
| 1 | | | | | | | | | |
| | | | | | (0.331) | | | | |
| 1.Skill | | | | | | 1.075 | 1.211*** | 1.341*** | 1.306*** |
| | | | | | | (0.886) | (0.260) | (0.254) | (0.303) |
| 1.Skill#c.Age1870 | | | | | | 0.00336 | | | |
| | | | | | | (0.0195) | | | |
| 1.Skill#1.age1835 | | | | | | | 0.0741 | | |
| | | | | | | | (0.524) | | |
| 1.Skill#1.Age5670 | | | | | | | | -0.490 | |
| | | | | | | | | (0.573) | |
| 1.Skill#1.Age18351 | | | | | | | | | -0.0444 |
| | | | | | | | | | (0.546) |
| Constant | -4.819*** | -4.395*** | -2.248*** | -2.680*** | -2.479*** | -4.180*** | -2.252*** | -2.778*** | -2.522*** |
| | (0.936) | (0.598) | (0.408) | (0.406) | (0.450) | (0.915) | (0.422) | (0.419) | (0.473) |
| Pseudo R2 | 0.1013 | 0.1011 | 0.0874 | 0.0811 | 0.0799 | 0.1010 | 0.0873 | 0.0814 | 0.0797 |
| Observations | 1,373 | 1,373 | 1,373 | 1,373 | 1,174 | 1,373 | 1,373 | 1,373 | 1,174 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results support all four hypotheses. Marginal analysis of the interaction of opportunity and age1870 (exact age of respondents from 18 to 70 years) shows that the influence of opportunity identification to start a business grows during young adult age, remains stable in middle age and declines in old age.

Figure-2.2: Margin Analysis of Interaction of Opportunity identification and Age in Early Stage Entrepreneurial Activity




The predictive margin shows that identifying an opportunity can ensure almost 7% of the probability of involvement in early stage entrepreneurial activity until middle age. This probability declines to less than 5% in old age when the influence entrepreneurial activity of identifying opportunity or failure to identify an opportunity is similar.

Table-2.3a: Interaction Effects of Opportunity & Age Groups in the Early Stage Entrepreneurial Activity

| Hypothesis 1 | Interaction of Opportunity and Age groups in Early Stage Entrepreneurial Activity | Net effect of age group when individual failed to identify the Opportunity[a] | Net effect of age group when individual identified the Opportunity[b] |
|---|---|---|---|
| Early Stage Entrepreneurship | Opportunity#Age1835 | .0035* (.0019) | .0297*** (.0062) |
| | Opportunity#Age5670 | -.0198*** (.0015) | -.0809*** (.0050) |
| | Opportunity#Age1835a | -.0048** (.0021) | .0037 (.0067) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Opportunity(0)#AgeGroup(1) - Opportunity(0)#AgeGroup(0) .

**b**. Opportunity(1)#AgeGroup(1) - Opportunity (1)#AgeGroup(0)

Table-2.3b: Interaction Effects of Opportunity & Age Groups in Serial Entrepreneurial Activity

| Hypothesis 2 | Interaction of Opportunity and Age groups in Serial Entrepreneurial Activity | Net effect of age group when individual failed to identify the Opportunity[a] | Net effect of age group when individual identified the Opportunity[b] |
|---|---|---|---|
| Serial Entrepreneurship | Opportunity#Age1835 | -.3682*** (.1094) | -.3637*** (.0845) |
| | Opportunity#Age5670 | .9121*** (.3439) | .6189*** (.2265) |
| | Opportunity#Age1835a | -.2139** (.0994) | -.2643*** (.0795) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Opportunity(0)#AgeGroup(1) - Opportunity (0)#AgeGroup(0) .

**b**. Opportunity(1)#AgeGroup(1) - Opportunity (1)#AgeGroup(0)

Table 2.3 shows the marginal effect as the difference in difference between the expected odds of opportunity for different age groups. The probability of being involved in early stage entrepreneurial activity is 3% higher for young adult than for the other two age groups if they recognise opportunity. The influence is highly significant. This rate is only

0.3% higher for young adult than other two age groups if they fail to recognise an opportunity. The reason for the difference between the two rates is that the multiplicative effects are relative to the baseline odds in their particular category. On the other hand, the probability of being involved in early stage entrepreneurial activity is 8% less for old people than the other two age groups if they can identify the opportunity. This highly significant result shows that opportunity identification matters for young adults and middle aged people compared to old people. The probability of being involved in early stage entrepreneurial activity is only 0.4% higher for young adults than for middle aged people, but the result is insignificant. These results reveal that there is no significant difference between young adult and middle aged people for involvement in early stage entrepreneurial activity based on opportunity identification.

However, in the case of serial start-up the above situation, use of opportunity by different age groups in entrepreneurship, is reversed. The probability of starting up another business is 36% lower for young adults than the other two age groups if they can identify the opportunity. The result is similar if they do not identify the opportunity. The probability of starting another business for late adults is 62% higher than for middle age or young adults if they identify an opportunity. This highly significant result shows that late adults can exploit opportunities optimally if they have experience of a career in entrepreneurship. However, in the case of not recognising the opportunity, old aged people have a 91% higher probability of starting another business than the two lower age groups. This may be because of their business network with other entrepreneurs or potential entrepreneurs. A young adult has a 26% lower probability than middle aged people if they can identify the opportunity. In comparison to middle aged people, young adults have a 21% lower probability of starting another business if they fail to recognise the opportunity. The above

results show that the influence of opportunity is sharply increasing with growing age in serial start-up entrepreneurship.

Figure -2.3: Marginal Effect of Interaction between Opportunity and Age in the Early Stage Entrepreneurial Activity.

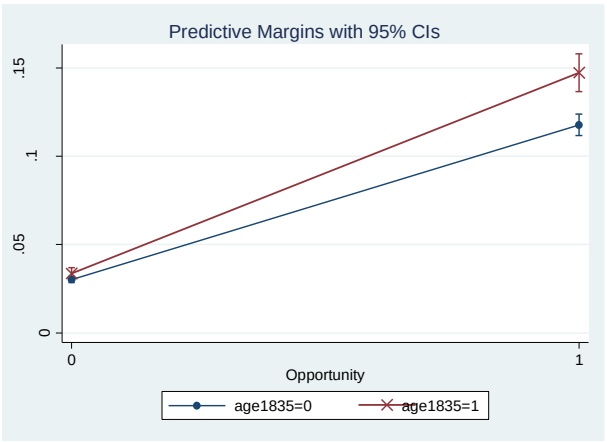



Figure-2.3(a): Marginal Effect of Interaction between Opportunity and Age1835 in early stage Entrepreneurship

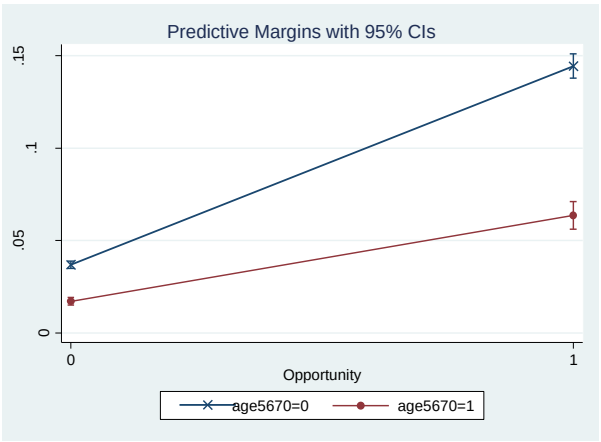



Figure-2.3(b): Marginal Effect of Interaction between Opportunity and Age5670 in early stage Entrepreneurship

The binary plots in Figure 2.3a and b depict the odds of being involved in early stage entrepreneurship for every combination of opportunity and age group. The graph shows that the differences between the age groups in Figure 2.3(a) are narrower for young adult than the differences between the age groups in Figure 2.3(b) for of older people. Figure 2.3(a) shows that the likelihood of the influence of opportunity for young adults is higher than the other two age groups. On the other hand, the likelihood of the influence of opportunity is lower for old people than for the other two age groups. These results reveal that the influence of opportunity identification is the highest for young adults followed by middle aged people and finally old people for early stage entrepreneurial activity.

Figure-2.4 depicts the result of the interaction between opportunity and age in serial entrepreneurship. Figure 2.4(a) shows that the differences between young adults and the other age groups are about same in both the conditions when opportunity is identified and when opportunity is not identified. In both these situations, young adults have a lower likelihood than the other two age groups of engaging in serial entrepreneurship. Figure 2.4(b) shows that old people have a higher likelihood of engaging in serial entrepreneurship than the other two age groups. The difference in the likelihood for old people and the other two age groups of being involved in serial entrepreneurship is higher if the respondent fails to identify an opportunity. Figures 2.4(a) and (b) show that the influence of age is continuously growing with older age and this influence is highest in old age.

Figure -2.4: Marginal Effect of Interaction between Opportunity and Age in Serial Entrepreneurship.

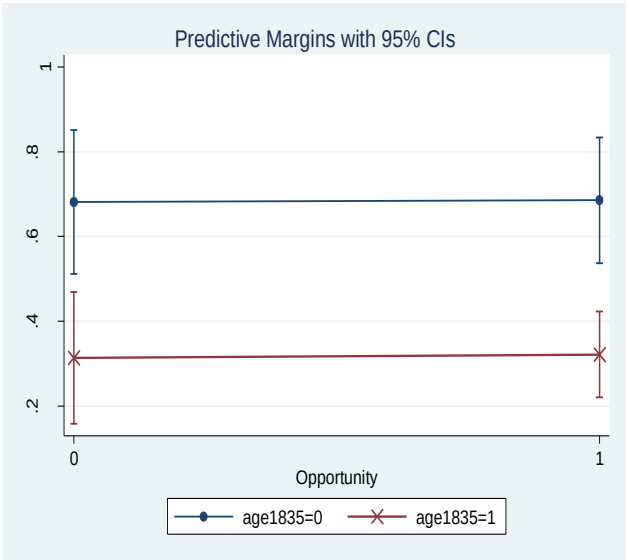



Figure-2.4(a): Marginal Effect of Interaction between Opportunity and Age1835 in Serial Entrepreneurship

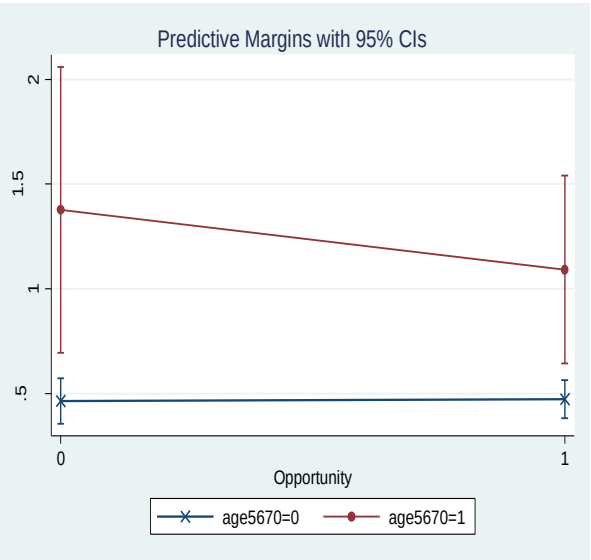
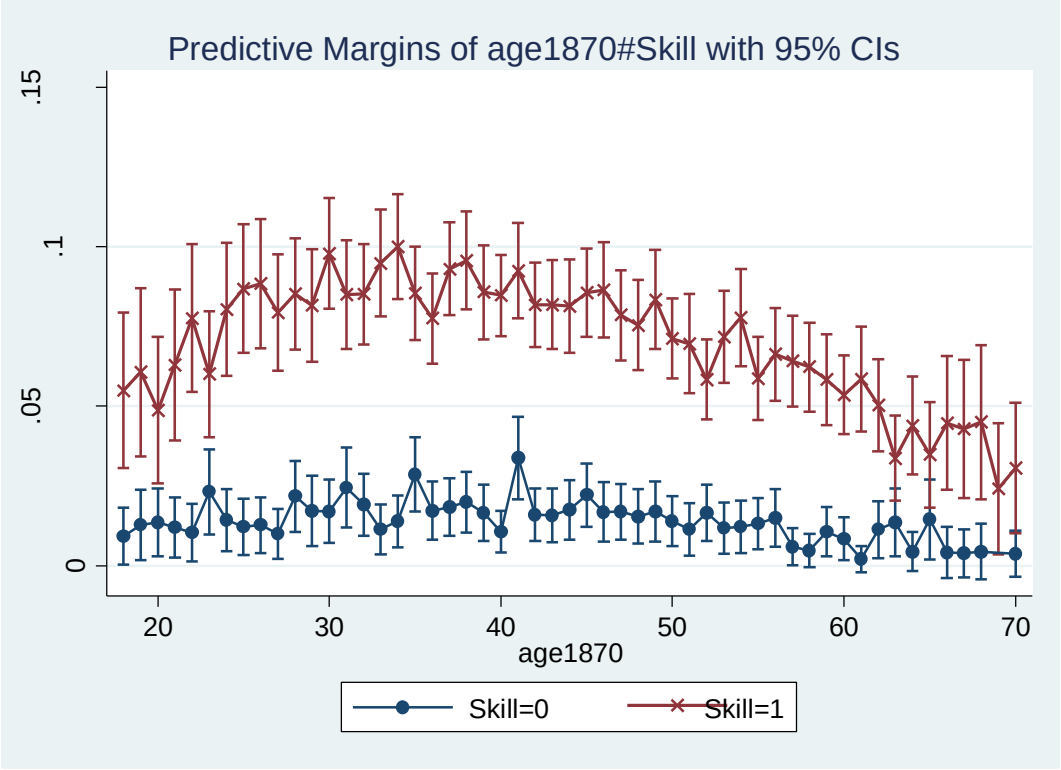



Figure-2.4(b): Marginal Effect of Interaction between Opportunity and Age5670 in Serial Entrepreneurship

In Figure-2.5, the margin of the interaction of skill and age shows that the influence of skill is growing with growing age in young adults. This influence persists in middle age and

declines in old age. There is no age difference for the influence if the skill is insufficient (skill=0) and the probability of involvement in early stage entrepreneurship is almost zero. Age changes from 18 years to 60 years contribute a between 5% and 10% probability of being involved in early stage entrepreneurship if the respondents have sufficient skills to start a business. This contribution drops to less than 5% after the age of 60.

Figure-2.5: Interaction Effect of skill and Age after Marginal Analysis:




Interaction effects (difference in difference) of skill and age groups are presented in Table-2.4. The results in Table-2.4a show that the influence of skills in early stage entrepreneurship decreases with growing age. The marginal effect of the interaction between skill and age1835 shows that the probability of involvement in early stage entrepreneurial activity is almost 4% higher for young adults than the other two age groups

if they have skills. This probability is only 0.5% more for young adults than the other two age groups if they do not have the skill required to start a business. The interaction between skill and age1835a compares young adult to the middle age group with or without skills. Young adults with skills have 1.54% more potential to be involved in early stage entrepreneurial activity than middle age people with skills. There is no significant difference between young adult and middle aged people without skills for early stage entrepreneurial activity. The probability of old people with skills to be involved in early stage entrepreneurial activity is 7% less than for the other two age groups with skills. These findings show that age matters for skills. The differences are significant.

Table-2.4a: Interaction Effects of Skill & Age Groups in Early Stage Entrepreneurial Activity

| Hypothesis 3 | Interaction of Skill and Age groups in Early Stage Entrepreneurial Activity | Net effect of age group when individual do not have sufficient Skill[a] | Net effect of age group when individual have sufficient Skill[b] |
|---|---|---|---|
| Early Stage Entrepreneurship | Skill#Age1835 | .0046*** (.0012) | .0392*** (.0050) |
| | Skill#Age5670 | -.0092*** (.0009) | -.0739*** (.0037) |
| | Skill#Age1835a | .0011 (.0014) | .0154*** (.0055) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Skill(0)#AgeGroup(1) - Skill(0)#AgeGroup(0) .

**b**. Skill(1)#AgeGroup(1) - Skill(1)#AgeGroup(0)

Table-2.4b: Interaction Effects of Skill & Age Groups in Serial Entrepreneurial Activity

| Hypothesis 4 | Interaction of Skill and Age groups in Early Stage Entrepreneurial Activity | Net effect of age group when individual do not have sufficient Skill[a] | Net effect of age group when individual have sufficient Skill[b] |
|---|---|---|---|
| Serial Entrepreneurship | Skill#Age1835 | -.0825 (.0573) | -.3928*** (.0815) |
| | Skill#Age5670 | .2844 (.2004) | .7637*** (.2277) |
| | Skill#Age1835a | -.0481 (.0550) | -2631*** (.0737) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Skill(0)#AgeGroup(1) - Skill(0)#AgeGroup(0) .

**b**. Skill(1)#AgeGroup(1) - Skill(1)#AgeGroup(0)

In serial entrepreneurship (Table-2.4b), old people use their skills substantially more than the two lower age groups. There is a 76% higher probability of serial entrepreneurship for old people than other two age groups if they have skills. In serial entrepreneurship, the influence of skill is 40% less for young adult than the other two age groups. The influence of skill is 26% less for young adult than middle age. The interactions between insufficient skill (skill=0) and age group are insignificant in serial entrepreneurship. These results are very interesting. The influence of skill is growing with growing age in serial entrepreneurship. On the other hand, the influence of skill is declining with growing age in early stage entrepreneurship. These findings support hypotheses 3 and 4. These results also show that the interaction effects of skill and age group are insignificant in serial entrepreneurship if respondents have insufficient skill.

Figure 2.6(a) shows that the likelihood of involvement in early stage entrepreneurship is higher in the young adult stage compared to the other two age groups if the respondents have sufficient skills. Figure 2.6(b) shows that older people have a lower likelihood of using

their skills than the other two age groups. If we compare the right sides of both figures (having skill) we can see the gap is wider in Figure 2.6(b). This indicates that the use of skill is highest in the phase of young adult and lowest in the phase of old age. However, the differences in the likelihoods of being involved in early stage entrepreneurship are very small among the age groups if the respondents do not have sufficient skills.

Figure-2.6: Marginal Effect of Interaction between Skill and Age in Early Stage Entrepreneurial Activity.

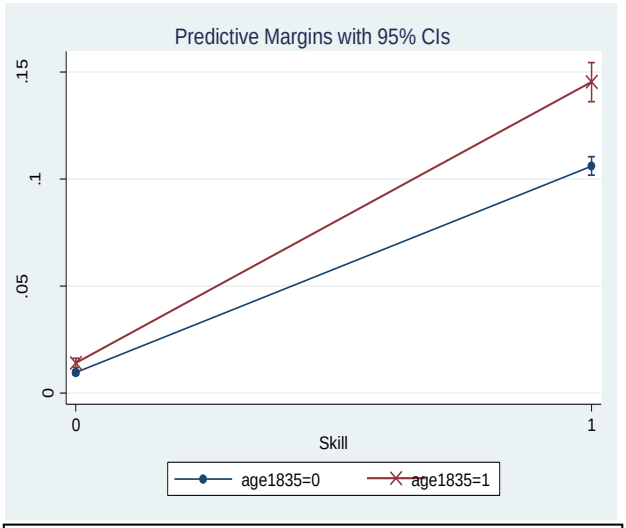



Figure-2.6(a): Marginal Effect of Interaction between Skill and Age1835 in early stage Entrepreneurship

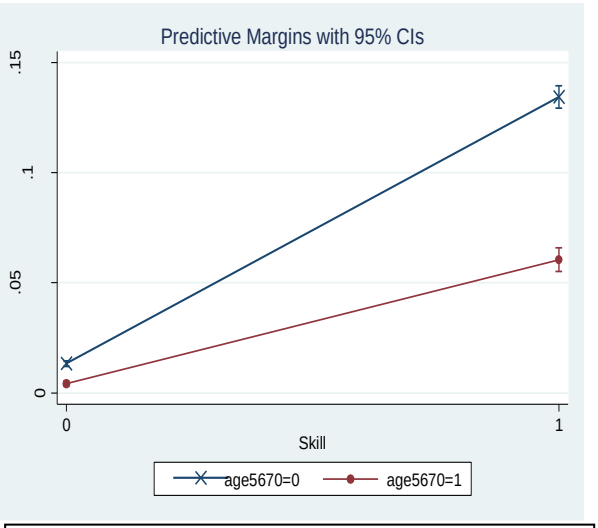



Figure-2.6(b): Marginal Effect of Interaction between Skill and Age5670 in early stage Entrepreneurship

Figure 2.7(a) and (b) reveal that the likelihood to be involved in serial entrepreneurship is the lowest in the young adult stage with skills and highest in old age. This indicates that the influence of skills in serial entrepreneurship is highest at old age and lowest at young adult. The differences persist if respondents have insufficient start-up skills, but the magnitude of the likelihood is significantly lower if respondents have no skills.

Figure-2.7: Marginal Effect of Interaction between Skill and Age in Serial Entrepreneurship

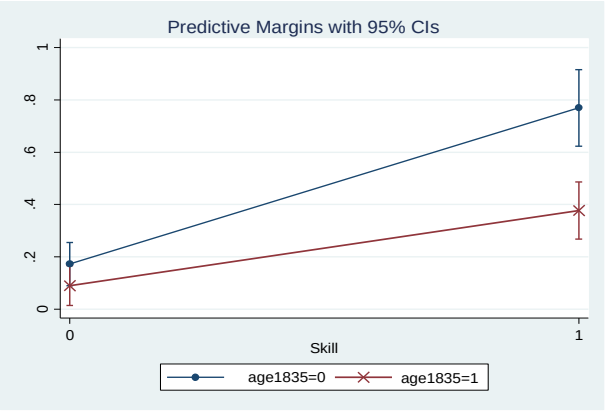



Figure-2.7(a): Marginal Effect of Interaction between Skill and Age1835 in Serial Entrepreneurship

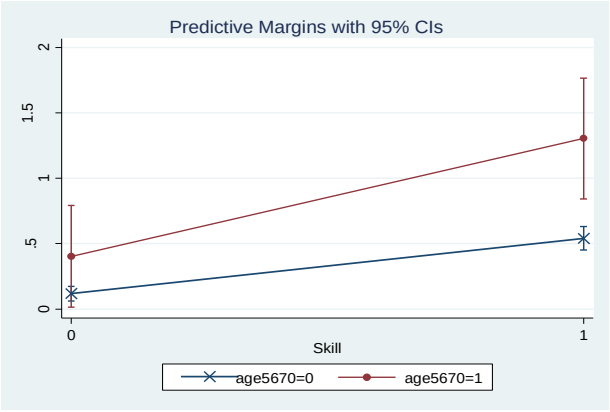



Figure-2.7(b): Marginal Effect of Interaction between Skill and Age5670 in Serial Entrepreneurship

## 2.4.1 Sensitivity Analysis of the Definition of Age Groups:

To analyse the sensitivity of age group we re-run the models using the new dummy variables for the revised age groups- age1830, age1830a, and age5170. The sensitivity analyses show that the revised age grouping is significantly sensitive to young adult in early stage entrepreneurial activity.

Table-2.3c: Interaction Effects of Opportunity & Age Groups in the Early Stage Entrepreneurial Activity

| Early Stage Entrepreneurial Activity | Interaction of Opportunity and Age groups in Early Stage Entrepreneurial Activity | Net effect of age group when individual failed to identify the Opportunity[a] | Net effect of age group when individual identified the Opportunity[b] |
|---|---|---|---|
| | Opportunity#Age1830 | -0.0031<br>(.0021) | 0.0095<br>(.0072) |
| | Opportunity#Age5170 | -0.0176***<br>(.0015) | -.0714***<br>(.0051) |
| | Opportunity#Age1830a | -.0133***<br>(.0023) | -.0219***<br>(.0077) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Opportunity(0)#AgeGroup(1) - Opportunity (0)#AgeGroup(0) .

**b**. Opportunity(1)#AgeGroup(1) - Opportunity (1)#AgeGroup(0)

Table-2.3d: Interaction Effects of Opportunity & Age Groups in Serial Entrepreneurial Activity

| Serial Entrepreneurship | Interaction of Opportunity and Age groups in Serial Entrepreneurial Activity | Net effect of age group when individual failed to identify the Opportunity[a] | Net effect of age group when individual identified the Opportunity[b] |
|---|---|---|---|
| | Opportunity#Age1830 | -.4594*** (.1063) | -.3348*** (.0819) |
| | Opportunity#Age5170 | .8003*** (.2263) | .4459*** (.1432) |
| | Opportunity#Age1830a | -.2301** (.0969) | -.2257*** (.0809) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Opportunity(0)#AgeGroup(1) - Opportunity (0)#AgeGroup(0) .

**b**. Opportunity(1)#AgeGroup(1) - Opportunity (1)#AgeGroup(0)

Changing the age groups by 5 years changes the results for young adult in relation to level of significance, sign, and magnitude of influence in early stage entrepreneurial activity. With the exception of the magnitude of the influence, which is as expected, the age group changes do not induce changes in the result of the interactions for serial entrepreneurship. The interaction between opportunity and revised age groups in early stage entrepreneurship shows that the level of significance of the interaction between opportunity and age1830 is negated.

Table-2.4c: Interaction Effects of Skill & Age Groups in the Early Stage Entrepreneurial Activity

| Early Stage Entrepreneurial Activity | Interaction of Skill and Age groups in Early Stage Entrepreneurial Activity | Net effect of age group when individual do not have sufficient Skill[a] | Net effect of age group when individual have sufficient Skill[b] |
|---|---|---|---|
| | Skill#Age1830 | .0022<br>(.0014) | .0250***<br>(.0062) |
| | Skill #Age5170 | -.0085***<br>(.0009) | -.0689***<br>(.0038) |
| | Skill #Age1830a | -.0021<br>(.0015) | -.0059<br>(.0066) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Skill(0)#AgeGroup(1) - Skill(0)#AgeGroup(0) .

**b**. Skill(1)#AgeGroup(1) - Skill(1)#AgeGroup(0)

Table-2.4d: Interaction Effects of Skill & Age Groups in Serial Entrepreneurial Activity

| Serial Entrepreneurship | Interaction of Skill and Age groups in Serial Entrepreneurial Activity | Net effect of age group when individual do not have sufficient Skill[a] | Net effect of age group when individual have sufficient Skill[b] |
|---|---|---|---|
| | Skill #Age1830 | -.0932<br>(.0569) | -.4130***<br>(.0814) |
| | Skill #Age5170 | .0598<br>(.0799) | .6927***<br>(.1579) |
| | Skill #Age1830a | -.0844<br>(.0609) | -.2312***<br>(.0764) |

*** p<0.01, ** p<0.05, * p<0.1

NB: **a**: Skill(0)#AgeGroup(1) - Skill(0)#AgeGroup(0) .

**b**. Skill(1)#AgeGroup(1) - Skill(1)#AgeGroup(0)

However, the interaction between opportunity and age1830a becomes highly significant. We can see an important change in the interaction between skill and age1830a. In line with the agility principle in life span psychology (Baltes, 1987), there is a significant

difference between young adult and other age groups. Considering the cognitive characteristics of young adults in psychology, the definition of young adult age 18 to 35 better explains the cognitive characteristics of young adult in our study.

## 2.5 DISCUSSION

The study explored the direct and modifying effects of age group on entrepreneurial activity. On the one hand, age influences entrepreneurial behaviour and on the other hand it modifies the influence of opportunity identification and skill in entrepreneurial behaviour. A more interesting finding is the reverse modifying influences of age on opportunity identification and skill in early stage entrepreneurial activity and in serial entrepreneurial activity. This finding shows that the influence of opportunity is modified significantly by different age groups in early stage entrepreneurial activity. The positive coefficient of the interaction between opportunity and age1835 shows that opportunity identification is more important for young adult than the other two age groups. The dummy variable age1835 represents young adult compared to middle age and old age. The dummy variable age1835a represents young adult compared to middle age. The dummy variable age5670 represents old age compared to middle age and young adult. Cognitive life cycle theory supports our findings for the interaction between age group and opportunity. Young adults are more influenced by opportunity than the other two age groups. In line with cognitive life cycle theory, this is the result of the agility principle in young age. At young adult age individuals have few life course options and less information in their memory. In the early stage of life, people have lack of knowledge and experience. This, in turn, gives them few life course options. With growing age, more information about external world is stored in their memory. This affects the cognitive control process of the brain. According to Craik &

Bialystok (2006, p132) *'Cognitive control increases in power, speed and complexity from infancy to young adulthood, and declines thereafter'.* As a result, information processing speed is very high in the early stages of professional life (Baudouin et al., 2009; Craik & Bialystok, 2006). This high information processing speed and the agility in the early stage of life help young adult to process information speedily related to an opportunity. However, genetic endowments, health related issues, fitness, and exposure to trauma may also contribute to the executive controlling of the brain and the information processing speed.

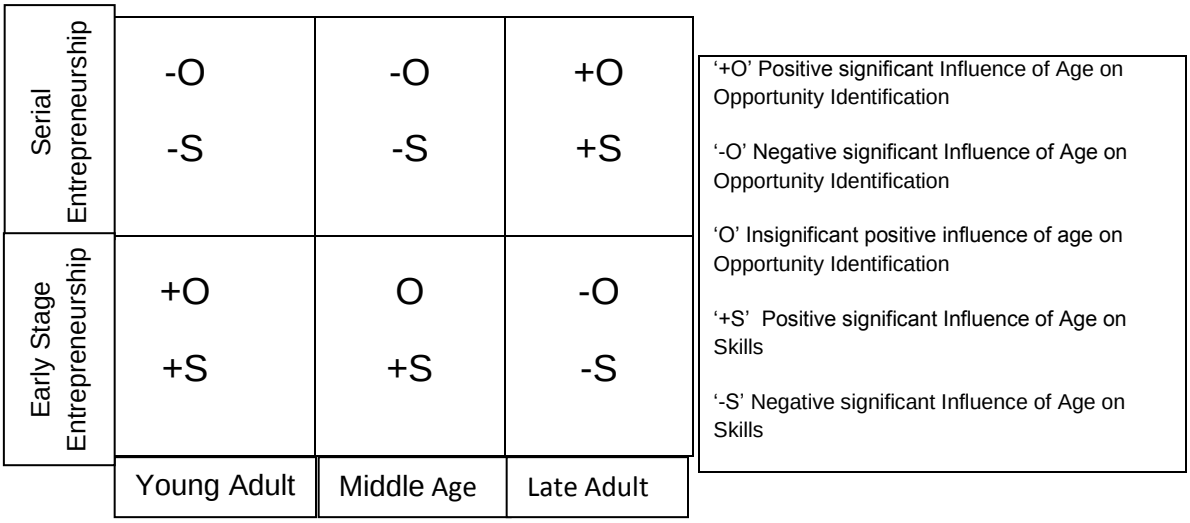
In serial entrepreneurship, late adults are influenced more by opportunity identification than the other two age groups. This is an exception to general life span cognitive analysis and is explained by new disuse theory. According to new disuse theory, periodic recall of stored information increases processing speed. People, who are already entrepreneurs, have limited and more focused life course. Though there is age related decline in old age, the information processing speed is higher than in the other age groups for the above two reasons. As a result, the influence of opportunity in serial start-up is higher for old age people. The interaction effect of age group with no opportunity identification shows that the probability of late adults being involved in serial entrepreneurial activity is 90% higher than in the other two age groups when they fail to identify an opportunity. This may be because of the social network effect in old age for serial entrepreneurs. An experienced old entrepreneur may fail to recognise the opportunity, but may engage more easily in serial start-up than the other two age groups if an opportunity is identified by a member of his or her social or business network. However, further research needs to be conducted to confirm this reasoning.

The study shows a contrasting trend in the use of skills by different age groups in early stage entrepreneurial activity and in serial entrepreneurship. Our results show that young

adults are more influenced by skill than the other two age groups in early stage entrepreneurial activity. This finding is consistent with the agility principle of young age in life span cognitive psychology. However, a highly significant positive influence of skill in young adult compared to middle aged people may seem inconsistent with the maintenance principle in middle age. We were expecting a positive, but insignificant result. This would confirm the maintenance principle. A possible explanation is that the skills of young adults are maintained in middle age, but gaining more skills in other areas over the years reduces the effectiveness of entrepreneurial skill. The interaction of insufficient skill with age group shows that young adult has a significant, but very minor influence on the influence of skill over other age groups. There is no significant difference in the influence of skill between young adult and middle age groups.

In serial entrepreneurship, late adults use their skills more efficiently than the other two age groups. The findings show that the influence of skill is increasing with growing age. This finding is supported by new disuse theory which states that repeated use or periodic use of the same skill increases retrieval efficiency. The coefficient of the interaction effect of skill and age1835 is -0.3928 which is lower than the coefficient of the interaction effect of skill and age1835a. The variable age35a represents young adult compared to middle age. This indicates that in serial entrepreneurship, the influence of skill is increasing with growing age. The insignificant interaction effects between insufficient skill and age group in serial entrepreneurship further amplifies the use of skills with growing age in serial entrepreneurship. The net influence of age on opportunity identification and skills in early stage and in serial entrepreneurship is shown in Figure 2.8.

Figure-2.8: Net Influence of Age on Opportunity and Skills in Early Stage and Serial Start-up Entrepreneurial Activity




Net influence is the influence of an age group compared to the remaining age groups. The influence of young adult is compared to middle age and late adult. The influence of late adult is compared to middle age and young adult. Middle age is compared only to only young adult to understand the net effect of middle age on growing age of young adult. Figure 2.8 shows the relationships in early stage and serial entrepreneurship when the opportunity is identified and there are the skills required to start a business. However, to use the result of serial entrepreneurship, we need to consider the potential selection bias problem in the data. Opportunity identification and skills are two key determinants of entrepreneurship. In Figure 2.8, 'O' denotes Opportunity identification and 'S' denotes Skills. A positive sign means a positive influence; a negative sign means a negative influence, and no sign means an insignificant positive influence. Figure 2.8 shows that the influence of age on the two key determinants of entrepreneurship is growing with growing age and declines at the old age stage of life. These influences give an inverse U shaped relationship between age and entrepreneurship. On the other hand, the influences of age on opportunity and skills in serial entrepreneurship are the opposite to early stage

entrepreneurship. These influences give a positive upward relationship between age and serial entrepreneurship.

From a theory perspective, the findings have two implications. Firstly, age is modifying the influence of the key determinants of entrepreneurship. Secondly, the influence of age on the key determinants is different in early stage and in serial entrepreneurship. In early stage entrepreneurship, the influence is an inverse U-shape, and is a direct effect. In serial entrepreneurship, the influence is upward towards the right with growing age. The findings of this study weaken the assumption of the theory of planned behaviour and the entrepreneurial event model. These theories assume that attitude sums up the influence of the demographic variables (Ajzen, 2011). For this reason, these theories do not consider demographic variables separately. However, the present study shows that there is a significant influence of age on skill and opportunity recognition in early stage entrepreneurship and in serial entrepreneurship. From a policy perspective, the results of this study should contribute to the design of customised intervention programmes for entrepreneurship development based on the cognitive conditions of the participants.

**2.6 LIMITATIONS:**

We used the GEM UK data in our analysis. In the GEM UK dataset both skill and opportunity identification are self-reported variables. The skill variable reports respondents' self-perceptions of their start-up knowledge and skill. Opportunity identification is also based on the respondents' perceived opportunity. Both the variables are dichotomous, but the dichotomous positive responses do not report differences in the skills and opportunity

identification stages of respondents. Some researchers might be critical of these self-reported dichotomous skills and opportunity identification responses.

Also, we use cross-sectional data for the life cycle analysis. This gives a snapshot of the static relationship between age and entrepreneurship. If we were able to analyse the responses of the same subjects over the years, this would allow analysis of the dynamic relationship between age and entrepreneurship.

As mentioned in section 2.3.2.2 the data on serial entrepreneurship has potential selection bias problem in two stages. Existing moles allow us to test selection problem in one stage. Since testing selection problem in two stages is complex, we did not test the selection problem of the data. So, we recognise the limitation of serial entrepreneurship data in the study.

## 2.7 CONCLUSION

The study sheds light on the reasons for the inverse U shape for entrepreneurial activity by age. The different stages of cognitive development are primarily responsible for these differences. We studied how age related cognitive conditions influence opportunity identification and skill in early stage entrepreneurial activity and serial entrepreneurship. In our study we considered the age groups 18 to 70: young adult, middle age, and old age. We found that the cognitive condition of young adult modifies the influence of opportunity identification highly significantly compared to the other two age groups. However, when we compare young adult with middle age for the influence of opportunity, we found no

significant difference. This indicates that the influence persists until middle age after which it declines. These findings are supported by life span cognitive theory. The influence of the cognitive condition of age is reversed in the case of serial entrepreneurship. In serial entrepreneurship, the cognitive condition of old people modifies the influence of opportunity identification highly significantly compared to the other two age groups. This difference persists if when we compare young adult with middle age. This means that, in serial entrepreneurship, cognitive condition improves and this improved cognitive condition modifies opportunity identification positively with growing age.

In the interactions between skill and age group, we found that the cognitive condition of age groups positively modifies the skill in start-up process in early stage entrepreneurial activity in young adult age, after which the influence declines sharply. This result is similar to the argument of disuse theory. On the other hand, in serial entrepreneurship the influence of cognitive condition to modify skill is highest in old age. These findings show that in serial entrepreneurship with growing age the influence of cognitive condition positively increases to modify the influence of skills in serial start-up, which is the result of enhanced efficiency of skill through repetition. Since there is no agreed age groups, we analysed the sensitivity of age group by changing the definition and found a significant change in our results for young adult for modifying the influence of opportunity identification. In all the other interactions, there were some changes in the magnitude of the influence.

These findings should improve theoretical effectiveness and help to design enterprise support programmes tailored to different age groups. Behavioural models assume that age

has an indirect influence on behaviour. This study shows that age has both a significant direct and indirect influence on entrepreneurial behaviour. This means that age has an impact in entrepreneurship behaviour analysis similar to attitude and self-efficacy. So, from a theoretical perspective, we need to include age in entrepreneurship behaviour modelling. Thus, the study helps us to achieve the overall aim of the study. From a policy perspective, to design the enterprise support programmes, we should emphasise entrepreneurial skill development programmes up to middle age, after which time the programme will not be effective. Also, business idea development support programmes will only significantly influence entrepreneurial start-up activity among young adults. In the next chapter, the impact of demographic variables (e.g. age, gender, parent's self-employment) and behavioural control variable will be studied to improve entrepreneurship behaviour theory to achieve overall aim of the study.

# Chapter Three

## Competency Value Theory of Entrepreneurship

### 3.1 INTRODUCTION

Choosing entrepreneurship as a career depends on individual career intention and subsequent actions (Schoon & Duckworth, 2012; Fayolle, 2005; Boyd & Vozikis, 1994). Research in the field of entrepreneurial behaviour draws mainly on three intention based theories: theory of planned behaviour (TPB) (Ajzen, 1991, 2002, 2012), entrepreneurial event (EE) model (Shapero & Sokol, 1982) and social cognitive theory (SCT) (Bandura, 1986; 2006; 2008; 2012. TPB is a theory of social psychology and the EE model is an entrepreneurship behaviour theory. These two theories were developed based on the theory of reasoned action (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). The theories explain entrepreneurial intention (Moriano et al., 2012; Linan et al., 2011; Obschonka et al., 2010). Intention is a mediating variable to explain behaviour. However, the capacity of existing theory to predict entrepreneurial behaviour has not been established (Audet, 2004) perhaps because few studies analyse entrepreneurial activity using behavioural theory while acknowledging its limitations. Kautonen et al. (2013; 2013a) found all the TPB variables significant for explaining behaviour. However, debate continues on the perceived behavioural control (PBC) variable in TPB, which is an extension of self-efficacy (Bandura, 1977; 2001), and the perceived feasibility variable in the EE model. TPB assumes that the deviation from intention to behaviour is the result of PBC while EE model assumes that perceived feasibility affects behaviour through intention. There is also a lack of consensus on the definition of the PBC variable. Some studies show that demographic variables have a significant impact on entrepreneurial intention and behaviour which are not considered in TPB (Robinson et al., 1991; Liñán, 2004; Kolvereid & Isaksen, 2006). Considering the

above, we would like to propose an improvement to existing theory, to overcome its limitations in the context of entrepreneurship, of inclusion of demographic variables and adoption of weighted competency value variables instead of PBC (Ajzen, 1991; 2011) or self-efficacy (Bandura, 1977, 1986, 2012) variables.

PBC measures the impact of perception of and belief in achieving success. To measure PBC, Ajzen (2002) multiplies the strength and power of ability beliefs. Earlier entrepreneurship studies used both competencies and success belief to measure PBC (see Table- 4 for a list of studies). Instead of using success belief and perception, we propose to use different required competencies and their weighted perceived values. Our assumption is that short-term consequences or habitual responses may work through the mental framework of success whilst long-term behavioural decisions are based on a logical analysis of required competencies. For example, for a single item 'success', an individual may think that, although he has entrepreneurial intention, he will not be successful because of lack of competencies in some areas since most people have shortcomings in certain areas. If the individual goes through a logical process he will discover complementary competencies that overcome his shortcomings. As a result, he will have a different response or behaviour over a longer period. This rejects the second condition of TPB, which assumes that intention and PBC remain stable over the periods of observation and assessment of actual behaviour. Thus, instead of using success as a behavioural control variable, we use required competencies as a behavioural decision variable for the entrepreneurial decision.

There are three stages or trends in entrepreneurship research based on psychological theories. In the first stage, personality and locus of control theory were the focus; in the second stage, attitudinal based theories became popular; and in the third stage intention based theories emerged in TPB (Ajzen 1988, 1991). Intention based theory has been widely used since the mid-1980s to identify the reasons for a behaviour. TPB can effectively explain entrepreneurial intention and short-term contextual behaviour (Armitage & Conner, 2001; Audet, 2004), but in the case of long-term behaviour is not sufficient to explain the variation. In the field of entrepreneurship, TPB is used mainly to analyse intention. This may be due to the poor definition and lack of predictive validity of long-term behaviour by PBC variables. This study addresses the question of how we can improve the behavioural control variable to analyse entrepreneurial intention and behaviour. We are interested also in how to improve existing theory. Our research should advance research on entrepreneurial behaviour by extending existing intention based theories to explain entrepreneurial behaviour. Since the proposed theory is based on competency, it will be easier for the policy makers to work on appropriate competencies rather than working with 'success expectation'.

The objective of this chapter is to propose an extension to intention based entrepreneurship theories to overcome the limitations of existing theories in explaining the variations in entrepreneurship intention and behaviour. Since entrepreneurship intention and behaviour do not take place simultaneously, we test our hypotheses separately at this stage. We hope to contribute to two areas of intention based theory in order to increase its validity: a) incorporating demographic variables in the theory by testing the direct relationship between demographic variables and entrepreneurial intention and behaviour;

b) testing weighted competency as the behavioural control variable, which is based on the required competencies for self-efficacy.

Chapter-2 discussed the influence of age on entrepreneurial behaviour in different stages of the life cycle. The findings in Chapter-2 suggest a strong possibility of a direct relationship between intention and behaviour when controlling for attitude to entrepreneurship. In the present chapter, we analyse the influence of age and other demographic variables on entrepreneurial intention, when controlling for attitude. This captures the direct relationship between demographic variables and entrepreneurial intention, which cannot be captured by the construct attitude. In addition, we want to improve the behavioural control construct by proposing a weighted competency construct instead of self-efficacy-based PBC construct in earlier theories.

We first provide a brief account of the theories applied in earlier studies to measure entrepreneurial behaviour. Competency value theory of entrepreneurship (CVTE) is proposed following a discussion of the limitations of existing theories. To test the hypotheses related to intention, we conducted a pilot study in a UK business school, and to test all the hypotheses, we conducted a national level study in a South Asian country. The methodology section presents the research design and the measures used. Data collection, data analysis and the results are presented separately for both studies. A detailed discussion of the results follows the results section related to the national level study. The chapter concludes with a final discussion.

## 3.2 PSYCHOLOGICAL THEORIES TO MEASURE ENTREPRENEURIAL BEHAVIOUR

There are three stages involved in understanding the supply side of entrepreneurship from a psychological perspective. First, enquiry was limited to identifying an entrepreneur's traits to understand the causes of observed entrepreneurial behaviour. This line of research was initiated by Collins and Moore's (1964) *The Enterprising Man* – which describes having the 'desire for independence'. Individual psychological characteristics such as creativity, daring, aggressiveness (Wilken, 1979), locus of control, risk tendency (Brockhaus, 1980) and gender differences (Rowen & Hisrich, 1986) have been identified as related to the development of entrepreneurship. The second stage, which was to understand the 'causes', emerged at roughly the same time, was based on the seminal work of McCleland (1967) - *The Achieving Society* - which identified the different social positions of entrepreneurs. McClelland explains why northern Europe and North America grew faster than other societies, and why the wealth was unevenly distributed. He identifies that need for achievement, need for affiliation and need for power constitute the roots to human motivation for achievement. The third stage began with the ground breaking work of Aijzen (1991) and TPB, in the field of social psychology. Since then, several authors have examined 'why the behaviour of the people of a society has been changing' over time (Kickul et al., 2008; Wilson et. el.; 2007; Schwarz et al., 2009; Linan & Chen, 2009). However, research on entrepreneurial intention and behaviour began with the development of the EE model (Shapero & Shokol, 1982) although this work received less attention. In the field of entrepreneurship, the central attention of these works was to identify the factors responsible for individuals' entrepreneurial intention.

In all three psychological perspectives on entrepreneurship, research was directed towards understanding the entrepreneurial drivers of individuals. Here, McClelland's

(1967) ‘need for achievement’ theory and ‘personality traits’ were widely applied in the 1960s and 1970s. According to the theory of need for achievement, individuals are motivated by three needs. These are ‘need for achievement’, ‘need for affiliation’ and ‘need for power’. Need for achievement makes people become entrepreneurs. McClelland identified that the ‘need for achievement’ among a population in society demonstrated the high economic and social growth of the society. The theory identifies a societal trend of needs, but overlooks some of the reasons why people choose entrepreneurship as a career. It does not address the individual level reasons for choosing entrepreneurship.

In cognitive science, personality traits, perception and attitudes are generally used to predict behaviour, However, the empirical relationship observed between personality traits and contextual behaviour is low (Mischel, 1968). Locus of control theory (Rotter, 1954, 1966), another trait theory, also does not explain achievement oriented behaviour (Warehime, 1972) or political behaviour (Levenson, 1981). Personality traits do not provide consistent outcomes in studies of why people start a business (Bygrave1989, Gartner 1989, Shaver & Scott 1991). Since attitude is a predisposition to a given aspect of the world, it was expected that attitude would explain individual entrepreneurial behaviour. As a result, in the 1960s, attitude was widely used to predict behaviour. Because of the importance of attitude in cognitive science, it was assumed that attitude could predict human behaviour. Attitudinal concepts were used in the 1960s and 1970s to predict behaviour, but later developments in meta-analysis argued that narrative reviews of diversified personality traits failed to identify small relationships, which were hidden within the insignificant results provided by narrative reviews (Zaho & Seibert, 2006; Ruch & Frese, 2007). Some (e.g., Ajzen & Fishbein, 1977) identified that general attitudes failed to

explain specific and contextual behaviour. Analysing these situations, Wicker (1969) called for an abandonment of the concept of attitude to analyse behaviour.

To overcome the poor validity of attitudes and traits to analyse behaviour, 'aggregation of specific behaviour' across occasions was proposed (Fishbein & Ajzen, 1974; Epstein, 1983) on the assumption that it would increase our understanding of behavioural disposition in different contexts. Based on this aggregation principle, in 1975, Fishbein & Ajzen proposed the 'Expectancy-Value model' of attitudes and later (1980) the theory of reasoned action. However, it was observed that the theory of reasoned action is effective only if the tested behaviour is under full volitional control (Sheppard, Harwick & Warshaw, 1988). The limited success of the theory of reasoned action prompted Ajzen to propose the TPB in 1988, which added control beliefs to behavioural beliefs and normative beliefs. According to Ajzen (1991), these three salient beliefs develop human intention and resultant behaviour. Behavioural beliefs develop human attitude; normative beliefs form the 'underlying' determinants of 'subjective norms'; and control beliefs give the foundation of perception of behavioural control. Behavioural beliefs and normative beliefs are explained by the theory of reasoned action. An individual's control beliefs give him the perception of the ability to perform a task. This is the foundation of PBC. Along the lines of the theory of reasoned action, the EE model was proposed by Shapero and Sokol in 1982. Though Ajzen improved the theory of reasoned action and renamed it TPB to predict general behaviour, no similar developments occurred for the EE model. As a result, entrepreneurial behaviour has remained poorly explained because of lack of appropriate theory. Some recent studies using social psychological theories are provided in Table 3.1.

Table 3.1: Some Recent Studies on Entrepreneurial Intention and Activity Using Behavioural Control Variable

| SL No | Year | Author | Significant Background variables | Behavioural Control variable | Method | Findings |
|---|---|---|---|---|---|---|
| 1 | 2013 | Kautonen et al. | - | PBC:<br>Easy to start a business, easy to be an entrepreneur, issues prevent me to start a business | SEM [Analysed short term behaviour] | All TPB variables including PBC have significant influences on intention and behaviour. |
| 2 | 2012 | Moriano et al | - | Self-efficacy (PBC): ability to:<br>Define a business idea, write a business plan, form relationships with investors & banks, recognise opportunities, relate to key people to obtain capital needed. | SEM | Self-efficacy has significant influence on intention but 'Subjective Norms' (SN) has weak influence on intention |
| 3 | 2012 | Ferreira et al. | - | PBC<br>Not explained. | PLS – Partial Least Square. | Attitude influences PBC but PBC has no significant influence on intention. SN has influence on attitude, no influence on intention |
| 4 | 2011 | Lee et al. | Age, education, income have sig influence on intention | Self-efficacy:<br>Task specific skills in a number of IT related areas | OLS regression | Self-efficacy has significant influence on entrepreneurial intention |
| 5 | 2011 | Iakovleva et al | Age has no influence on attitude but gender is significant for attitude. Past self-employment experience has significant influence on all 3 TPB variables. Student sample | PBC<br>Item: easiness, self-willingness, sufficient control of business, few circumstances beyond control. | SEM | PBC has significant influence on intention. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | 2011 | Fitzsimmons & Douglas | Sex and prior self-empl sig. | Interaction between desirability and feasibility | Hierarchical Regression modelling | Desirability, feasibility and their interactions have significant impact on intention. |
| 7 | 2011 | Kautonen et al | - | PBC:<br>Easy to start own firm, Easy to pursue entp career; Chance of success | PLS path model | PBC has significant influence on entrepreneurial intention in third age |
| 8 | 2011 | Summer & Haug | - | PBC:<br>Perceived feasibility<br>Task specific self confidence | SEM | PBC has positive influence on intention but SN has no influence on intention |
| 9 | 2011 | Linan et al | - | PBC is defined as perceived feasibility or self-efficacy:<br>preparedness, controlling creation process, knowing practical details to start, knowing to develop entp project, high probability of success. | Factor Regression-problem in the methodology | Significant influence of feasibility on intention |
| 10 | 2010 | Obschonka et al. | Gender has direct influence on EI | Entrepreneurial control belief:<br>3 ability related items and 3 context related items. | SEM | Control belief has significant influence on entrepreneurial intention. |
| 11 | 2010 | Teo & Leo | - | PBC:<br>Clear interaction with subject, easy to get, easy to use | SEM | PBC have significant influence on intention |
| 12 | 2010 | Prodan & Drnovsek | Role model, network, & years of education has significant direct impact on EI. | Self-efficacy: followed Chen et al. (1998) measures -<br>Control costs, define organisational roles, define organisational responsibility, develop new ideas, develop new product, develop new services, establish product market position, expand business, set and attain profit goals, set and attain market share goals, and set and attain sales goals. | SEM | Self-efficacy has significant positive influence on academic entrepreneurial intention. |
| 13 | 2010 | Prieto et al | Family background has significant influence | Self-Efficacy:<br>Family self-employment background, social networks, legal system support, govt support, social norms | Regression | Entrepreneurial self-efficacy has significant influence on propensity to self-employment |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | 2009 | Linan & Chen | Gender, role model, self empl. Exp & work exp has significant on tpb variables for intention. But age was insignificant. | PBC:<br>Easy to start a firm, prepared to start a firm, controlling the creation process, practical detail, knowledge on entrepreneurial project, probability of success | SEM | PBC and Attitude have significant influence on intention |
| 15 | 2008 | Gelderen et al | Did not test background variable | PBC:<br>Item: Perseverance, self-efficacy, entrepreneurial alertness, and creativity. | Logistic & multiple linear Regression | Self-efficacy, entrepreneurial alertness have significant influence on intention |
| 16 | 2008 | Linan | - | PBC:<br>Easy to start, able to control the creation process, high chance of success to start. | SEM | PBC has significant influence on entrepreneurial intention |
| 17 | 2008 | Kickul et al. | - | Self-efficacy:<br>12 leadership competency based items related to business success | SEM | Self-efficacy has significant influence on intention for both male and female. |
| 18 | 2006 | Kolvereid & Isaksen | Gender is significant for behaviour but education is for attitude | Self-efficacy (PBC):<br>Opportunity recognition, Investor relationships, Risk taking, and Economic management. | Hierarchical regression | The study strongly supported theory of reasoned action but no support for extension of TPB |

Table 3.1 shows that the theories were successful in cases with a short time-span between observation of intention and assessment of behaviour, and where the behaviour has a short-term effect or is habitual. However, over long time periods, involved in volitional understanding, the theories may fall short. Because of this limitation, Kautonen et al. (2013, 2013a) analyse the relationship between entrepreneurial intention and behaviour over a 12 month period. The examples provided in Ajzen (1991) are giving a gift (Netmeyer, Andrews & Durvasula, 1990), election voting choice (Watters, 1989), problem drinking (Schleget et al., 1990), and playing six video games (Doll & Ajzen, 1990). All these situations are either habitual or short-term oriented. However, choosing entrepreneurship as a career is a long term decision involving some ambiguity and uncertainty from a volitional standpoint. Kautonen et al. (2013) identify that all three variables are significant for analysing entrepreneurial behaviour, and that the model works effectively. However, the study has some fundamental flaws. First, the study does not maintain stability of behavioural control between two observed periods. This violates the second condition of TPB. Second, it uses purposive samples for the second wave of observations. It surveys only those who expressed a high intention to be an entrepreneur. The purposive sampling and poor study design reduces the acceptability of the results and negates claims regarding the success of TPB.

People have personal characteristics and certain demographic conditions that can overcome ambiguity, and this is not explained by TPB theory. In real-life situations, some people are deterministic and others are flexible in their intentions. This influences the extent to which they will be committed to behaving according to their intention. This flexibility is not related to their ability or to PBC, but rather depends on their demographic conditions and background. TPB assumes that demographic conditions and background are captured by individual attitude, based on behavioural belief. To explain the background

factors in TPB Ajzen, (2011, p. 1123) argues that *"… the most detailed substantive information about the determinants of a behaviour is contained in a person's behavioural, normative and control beliefs. The theory does not specify where these beliefs originated; it merely points to a host of possible background factors that may influence the beliefs people hold – factors of a personal nature such as personality and broad life values; demographic variables such as education, age, gender and income; and exposure to media and other sources of information. Factors of this kind are expected to influence intentions and behaviour indirectly by their effects on the theory's more proximal determinants".* This explanation nullifies any direct relationship between any demographic factor and individual intention and behaviour when considering behavioural belief or attitude in the model. Previous studies find that demographic variables such as age and gender, have a direct influence on both attitude and intention (Iakovleva et al., 2011; Lee et. al., 2011; Prieto et al., 2010; Obschonka et al., 2010; Linan & Chen, 2009; Kolvereid & Isaksen, 2006 ). On the other hand, Stuetzer et al. (2014) found that age has a significant influence on both entrepreneurial intention and activity. This implies that variations in demographic conditions explain not only entrepreneurial attitudes but also entrepreneurial intentions and behaviour. Among the demographic variables, age and gender have been tested in earlier studies (Stuetzer, 2014; Linan & Chen, 2009; Arenius & Minniti, 2005). Since parents' self-employment has been found to be a determinant of self-employment (Henley, 2007), it is expected that self-employment of either or both parents will have a direct influence on intention and activity along with attitude. Based on this, we assume that the inclusion of demographic variables in intention and behaviour or activity analysis will have a significant impact: Thus we hypothesise that:

***Hypothesis 1a: Demographic factors have a significant impact on entrepreneurial intention.***

***Hypothesis 1b: Demographic factors have a significant impact on entrepreneurial activity.***

In an attempt to find the effectiveness of intention based models, Kruger et al. (2000) compared the TPB (Ajzen, 1991) and the EE model (Shapiro & Sokol, 1982). They found that the models give almost identical results for identification of entrepreneurial intention. However, intention does not predict actual entrepreneurial behaviour. Blanchflower and Oswald (1998) were puzzled by the wide variation between entrepreneurial intention (about 50%) and the actual entrepreneurship level (about 15%) in some western countries. Henley (2007) identifies that a majority of the transition to self-employment from the entrepreneurial aspiration occurred during less than one year. However, only 4.6% of entrepreneurial aspirants chose self-employment as a career during that the period. This rate increases to 8.1% if the time period is over two years. The study was conducted by using British Household Panel Survey (BHPS) data for the period 1998–2002. The study successfully identifies the very high variation between entrepreneurial intention and behaviour, which challenges the TPB of entrepreneurship. In investigating the causes for the steeper deviation between entrepreneurial intention and behaviour, Blanchflower and Oswald (1998) identify capital constraints as the main obstacle to people intending to become entrepreneurs. However, they show that (lack of) financial resources are necessary for entrepreneurial success, not for entrepreneurial start-up (Henley, 2007). A possible explanation for this difference might be that people scoring low in a competency script assign maximum importance to that script, in this case, lack of capital.

## 3.3 COMPETENCY VALUE LOADING FOR PREDICTING ENTREPRENEURIAL BEHAVIOUR

In complex causality analysis, factor loading or weighting may be an effective method to avoid response bias of individuals. Intention based models might be used to address the issue of entrepreneurial intention, but they are less successful in explaining entrepreneurial behaviour (Audet, 2004). Several studies analyse entrepreneurial intentions using these models, and assume that intention is the main variable explaining behaviour (please see table 3.1). Since existing intention based models are unable to analyse intended behaviour, we need to investigate the other factors responsible for the variation between intention and behaviour, and how they influence human behaviour.

Several theoretical analyses examine the factors responsible for entrepreneurial behaviour (Busenitz & Barney, 1997; Shane, 2000; Dreisler, Blanker, & Nielsen, 2003; Baron, 2004; Endres & Woods, 2006). These factors include counterfactual thinking, over-confidence, information processing and responses, and risk estimation behaviour. We can group this work into opportunity identification behaviour, and risk taking behaviour. Both behaviours are related to individual competencies and cognitive conditions. Individual cognitive conditions of behaviour can be subdivided into i) knowledge-based behaviour which is related to higher level problem solving; ii) rule based behaviour based on past learning; and iii) skill based behaviour which relates human information processing and control task. Measuring each type of behaviour requires different types of items based on the level of behaviour. However, in the TPB, all behaviours are measured by intention and PBC. This creates confusion in measuring the construct. Since entrepreneurial behaviour is a skill based behaviour related to human information processing, the behaviour should be measured using the skills or competencies required to perform the behaviour. We assume

that entrepreneurial behaviour is the result of intention, demographic conditions, and the weighted aggregate result of different competencies to start a business. We assume it is a weighted aggregate result since all factors do not contribute equally to the behavioural decision, and the perceived importance of all factors are not same to the people involved in the entrepreneurial decision. As a result, we propose CVTE, which counts the individual's self-state of readiness for an entrepreneurial career interacted with perceived importance of requirements (variables) to be an entrepreneur. This not a new theory; it is incremental and builds on TPB and EE. It replaces the PBC variable in TPB and perceived desirability in the EE model, and instead uses weighted competency as the behavioural control variable. As already mentioned, because of cognitive bias, people either entrepreneurs or non-entrepreneurs, put different weight on the competencies, in their decision. Decision weight helps to explain behavioural variation in complex risk avoiding, or in risk seeking conditions (Kahneman & Rversky, 1979, 1992). Unlike expected utility theory (Bernoulli, 1954), where probability is used as a weight, we propose decision weight to analyse behavioural outcome following the ratio approach (Jia et al., 1998). The following hypothetical examples help to explain the possible cognitive bias of individuals involved in evaluating alternatives to the entrepreneurial decision:

Example 1: Mr X & Mr Y, both have poor prior skills for starting a business, but they have friends who run their own businesses. Mr X and Mr Y are very interested in starting their own businesses. They have sufficient financial funds. Their responses in a typical survey to a 7 point psychometric questionnaire are as follows:

Table 3.2: Hypothetical Responses of Mr X & Mr Y

| Variable | X | Y |
|---|---|---|
| Skill | 2 | 2 |
| Social Network | 5 | 5 |
| Financial Arrangements | 4 | 4 |

Here, Mr X started a business, and Mr Y became a paid employee. In this situation, the above factors are able to explain their intentions, but not their entrepreneurial decision.

In the following example, we show how weighting would improve the explanation:

Example 2: In the above situation, Mr Y did not start a business because he over valued the skill requirement to start a business. The value perception of Mr X was different from Mr Y's. This made Mr X interested in starting a business. Table 3.3 shows the weighted competencies of Mr X and Mr Y.

Table 3.3: Hypothetical Weighted Competency Value of Mr X & Y

| Variable | X | | | | Y | | | |
|---|---|---|---|---|---|---|---|---|
| | Component Score | Value | Ratio | Weighted score | Component Score | Value | Ratio | Weighted score |
| Skill | 2 | 40 | .235 | .47 | 2 | 80 | .47 | .94 |
| Social Network | 5 | 70 | .412 | 2.06 | 5 | 30 | .177 | .885 |
| Financial Arrangements | 4 | 60 | .353 | 1.412 | 4 | 60 | .353 | 1.412 |
| Total | 11 | 170 | 1.00 | 3.942 | 11 | 170 | 1.00 | 3.237 |

Note: Hypothetical responses are used for both examples.

In the above example, both Mr X and Mr Y feel that they do not have sufficient skill to start a business (self-reported score - 2), but they have high social networking (score- 5) and moderate financial arrangements (score - 4). The value (evaluation of importance of the variable) loading of X and Y shows that Y puts highest importance on skill requirement while X put the highest value on social network. As a result, X used his social network to minimise the skill limitations while Y does not exploit his strong social network since he does not understand its importance for starting a business. The above examples highlight the importance of weighted competencies to analyse entrepreneurial behaviour and

portray further improvement opportunity of existing entrepreneurship behaviour theory. In section 3.4 we discuss the improvement opportunity in the behavioural control variable.

### 3.4 COMPETENCY VALUE THEORY OF ENTREPRENEURSHIP (CVTE)

Based on the above analysis, we can say that entrepreneurial behaviour is the result of intention and different weighted competency values. Individual entrepreneurial intention develops through the intensity of attitude towards entrepreneurship, demographic variables and social acceptance of entrepreneurship as a profession. Weighted competency values are based on the interaction of different competencies and the weights of the corresponding competency values. The relationships are depicted in Figure 3.1**:**

Figure3.1: Competency Value theory of Entrepreneurship (CVTE)

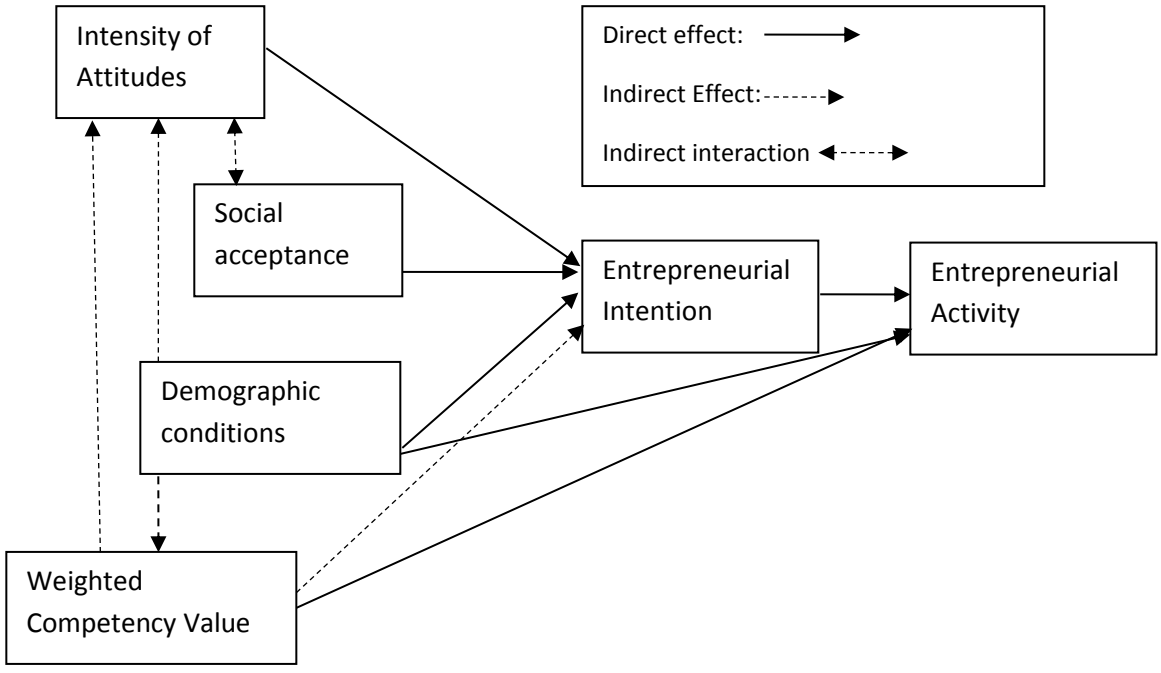


Figure 3.4 shows that intensity of attitude is an aggregate organised condition of individual values, beliefs, perceptions and personality traits to be an entrepreneur. Attitude has a direct impact on entrepreneurial intention. Demographic conditions include age, gender, parents' profession, region, etc. Competencies are a set of qualifications required to be an entrepreneur. Competencies include business knowledge and skills, business ideas and opportunity identification competencies, networking ability, available finance, and competence to work independently. We assume individuals have two types of evaluation for each competence. One is self-evaluation of these competencies, and the other is the importance or the value of the competencies for becoming an entrepreneur. Unlike PBC, we also assume that competencies on their own will contribute positively to develop intention, but if these competencies are interacted with the corresponding value or weighted value, the result will change. This is because personal competencies for entrepreneurship result in mental readiness for entrepreneurship. However, the weight of these competencies for success is the difference between intention and behaviour.

### 3.5 WEIGHTED COMPETENCY AND PBC

The main differences between PBC in TPB and weighted competencies are: first, PBC is based on the ability beliefs of an individual. In weighted competency, behavioural control is based on the comparative importance of perception of required competencies. Second, PBC is a multiplicative value of strength of ability and power of ability, whereas weighted competency is the multiplicative result of the required competencies and the comparative importance of the competencies to start an activity. Third, competencies are the source of ability belief. People can rate specific competencies more easily than ability if the information on the process is not entirely clear. For example, if the business start-up process is ambiguous, the individual will be unable to give an appropriate response on

ability belief related to the behaviour. However, he or she can rate personal competencies even in ambiguous situations. Fourth, if the business start-up process is unknown to the respondent, she/he may give a biased response to power of ability of PBC, which ultimately will make the variable less effective to explain behavioural control. On the other hand, a weighted ranking of the required competencies might help to minimise response bias in an unknown situation and, in turn, could increase the effectiveness of the behavioural control variable. These are the main differences between weighted competencies and PBC.

### 3.5.1 Competencies, Weighted Competencies and Entrepreneurial Intention

Earlier studies of entrepreneurial intention use TPB (Ajzen, 1991), EE (Shapero & Shokol, 1982) or Human Agency Theory (Bandura, 2002). These studies emphasise belief and competencies. The items of the PBC construct in TPB or the self-efficacy construct in the human agency model show (see table 3.1 for a detailed list) that belief related to skill to start and run a business is a common item in almost all studies. Some studies (e.g. Prodan & Drnovsek, 2010; Kolvereid & Isaksen, 2006) use opportunity identification as an item for behavioural belief. In forming the construct, more emphasis is given to the belief than the competencies that are the source of the belief. Kovereid and Isaksen (2006) consider the following items for self-efficacy: opportunity identification competency, investor networking competency, risk taking competency, and management skills. Kickul et al. (2008) consider 12 items of leadership competencies related to business success. Lee et al. (2011) consider task specific skills in information technology related areas to analyse entrepreneurial intention. Moriano et al. (2012) consider the following abilities related to competencies to start a business: recognising opportunities, relationship (networking) with investors, networking with the key business people, and writing a business plan. Studies

employing the PBC construct consider both competencies and perceiving complexity-related items to start a business (Iakovleva et al., 2011; Linan, 2008, Linan & Chen, 2009; Teo & Leo, 2010; Kautonen et al., 2013). Some studies include success probability (Linan et al., 2011; Kautonen et al., 2011). However, as hypothetical examples 1 and 2 show, competencies are sufficient to explain intention. In the hypothetical examples 1 and 2, both X and Y have the same kind of responses to the competencies and have a positive intention to start a business. Thus, we assume that competencies alone are sufficient to explain entrepreneurial intention. On the other hand, previous studies found that PBC has significant influence on entrepreneurial intention (Iakovleva et al., 2011; Linan, 2008; Linan & Chen, 2009). This implies that behavioural control may regulate the relationship between intention and behaviour, but has significant influence on intention. Since weighted competency is a behavioural control construct, it will have significant influence on entrepreneurial intention. As a result, both competency and weighted competency have significant influence on entrepreneurial intention. Thus, we hypothesise that:

***Hypothesis 2a: Competencies have a significant influence on entrepreneurial intention.***

***Hypothesis 2b: Weighted competencies have a significant influence on entrepreneurial intention.***

3.5.2 Competencies, Weighted Competencies and Entrepreneurial Activity

Weighted competency is a behavioural controlling construct in CVTE theory which regulates the relationship between intention and behaviour. It performs same role as PBC. In TPB theory, PBC explains the behavioural variation among people (Ajzen 1991, 2002,

2010). Ajzen argues that PBC influences both intention and behaviour simultaneously. He argues that PBC is the multiplicative result of control belief power and control belief strength. Control belief power is the importance of the belief in the ability to perform a specific behaviour. For example, importance of proper equipment for mountain climbing is a control belief power while control belief strength is the personal strength of belief to perform a specific behaviour, for example, the belief strength in the context of having the equipment required to climb a mountain. Ajzen (2002) argues that personal belief strength is the individual's perceived self-efficacy (Bandura, 2002), and this self-efficacy is not sufficient to explain the behaviour. The multiplicative result of both belief strength and power determine actual behaviour. Ajzen considers this multiplicative result as PBC since the variable is expected to put control or rationale on behavioural attitude and intention. However, the argument has some weaknesses in behavioural studies. Both belief strength and power are subjective evaluations of respondents and thus, any bias in responses will be multiplied and will inflate the response. This is particularly important if the respondent has no previous business experience, no business education, or no job experience related to the business process. As a result, he or she might assign an arbitrary biased value to both importance and strength of belief. This problem can be avoided by using weighted competencies. The weighting of strength of competencies based on comparative value of competencies represents weighted competencies. As explained in hypothetical example 2, weighted competencies reduce response bias and explain the significant relationship between weighted competences and behaviour.

Kautonen et al. (2013) find that PBC has a significant influence on entrepreneurial behaviour. They conducted a longitudinal study of 3,287 individuals in Austria and Finland in a first wave in 2011 and 969 individuals in a second wave in 2012. They selected the

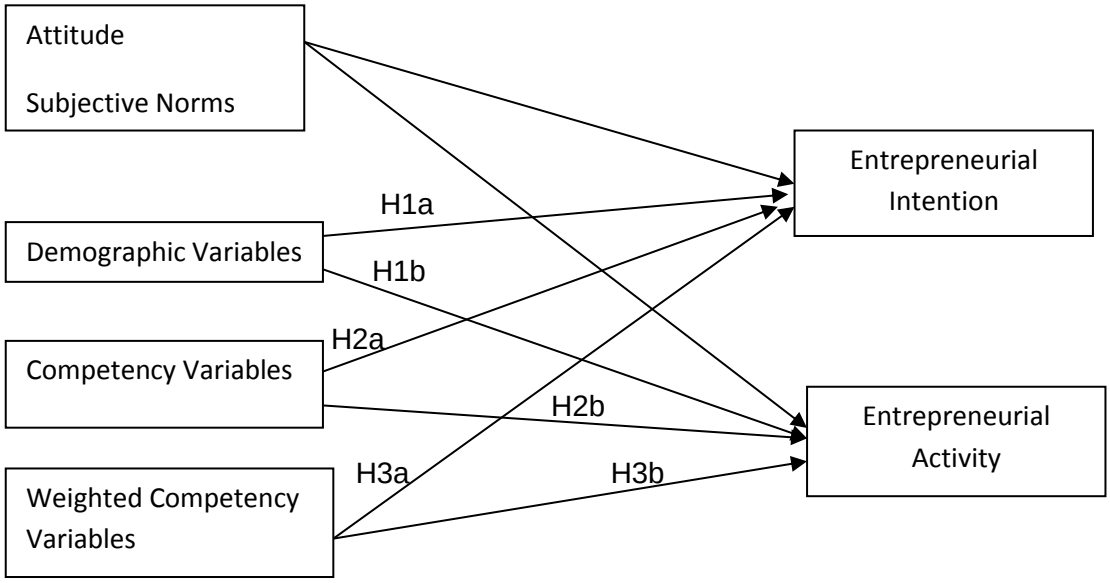
sample for the second wave based on certain criteria: fewer missing responses and high positive intention to start a business. This resulted in a very high potential for sample selection bias. In their analysis, they used Chi-square tests for categorical variables and t-tests for continuous variables to control for the potential sample bias problem. However, these techniques are not robust enough to test the selection bias problem. The findings show that PBC has a significant influence on entrepreneurial intention and behaviour. Since weighted competency is a behaviour controlling construct, we would expect that weighted competency would have a significant influence on entrepreneurial activity. However, in this study we do not consider the relationship between intention and behaviour. As a result, the influence of competencies on behaviour will remain significant. Weighted competencies regulate the relationship between intention and behaviour. Since we do not consider the influence of intention in behaviour analysis, the influence of both competencies and weighted competencies will be significant. Hechavarria et al. (2013) find that self-efficacy has a significant negative influence on quitting the business start-up process. They used different ability beliefs to measure self-efficacy. As already mentioned, in our study we use competencies instead of ability beliefs. Based on this, we assume that competencies will have a positive influence on entrepreneurial activity if the influence of intention is not considered in behaviour analysis. On the other hand, weighted competencies will have a significant influence on both intention and behaviour. As a result, we assume that both competencies and weighted competencies have a significant influence on entrepreneurial behaviour. Thus, we hypothesise that:

***Hypothesis 3a: Competencies have a significant influence on entrepreneurial activity.***

***Hypothesis 3b: Weighted competencies have a significant influence on entrepreneurial activity.***

The hypotheses are shown in Figure 3.1.1:

Figure 3.1.1: Study hypotheses




The Hypotheses are listed below in the table:

Table 3.4: Study Hypotheses

| | |
|---|---|
| *Hypothesis -1a:* | ***Demographic factors have a significant impact on entrepreneurial intention.*** |
| *Hypothesis -1b:* | ***Demographic factors have a significant impact on entrepreneurial activity.*** |
| Hypothesis – 2a: | ***Competencies have a significant influence on entrepreneurial intention.*** |
| *Hypothesis -2b:* | ***Weighted competencies have a significant influence on entrepreneurial intention.*** |
| Hypothesis -3a: | ***Competencies have a significant influence on entrepreneurial activity.*** |
| *Hypothesis -3b:* | ***Weighted competencies have a significant influence on entrepreneurial activity.*** |

## 3.6 METHOD

There are four main components to CVTE: attitude, social acceptance, demographic variables, and weighted competency value. TPB considers attitude, social norms and PBC to analyse intention and behaviour. Social acceptance and social norms are the same, we use more accessible term social acceptance. To test our hypotheses and the resultant CVTE theory, we considered weighted competencies instead of PBC or self-efficacy or perceived feasibility. Here, perceived feasibility of the EE model and self-efficacy of human agency theory are similar. Following earlier studies, for comparison purposes we consider competencies. Here, competencies represent self-efficacy, and the weighting value of competencies based on the comparative power of the competencies, represents weighted competencies. We ran a pilot study in a business school in the UK, and a national level study in a South Asian country.

We follow Ajzen (2002) to construct competency and the value of the competency. Ajzen and Driver (1991) used four skills to analyse the PBC of mountain climbing. These are: good weather, appropriate equipment, living near mountains, skills and knowledge. Ajzen (2002) argues that the measurement of PBC requires measuring control belief strength and control belief power. The product of strength times power of each item is summed and result is PBC. Our PBC measure considers five items: business opportunity identification, skill and knowledge, social network, sufficient funds, and ability to work independently. Previous studies identify that the competencies required to be an entrepreneur include skill, finance, network, and opportunity identification. We add 'ability to work independently' to the competencies required to be an entrepreneur. This is a personality trait and a generic competency. Rather than summing all the competencies together we keep them separate to understand their individual effects on intention and behaviour.

The demographic variables used in the study are gender, parents' profession and age. Gender is a dichotomous variable that takes the value 1 if the respondent is a male and zero for female. For parents' profession, if either parent runs or has run a business, in the pilot study this takes the value 1 and zero otherwise and in the national study takes the respective values of 1 and 2. Table 5 provides details of the variable coding and description for both the pilot and national studies. We use direct measurement technique (Ajzen, 2002) to measure attitude and social acceptance using a single item. There is debate over the use of single or multiple item measurement constructs in social science research – and especially in psychology, management and marketing. In a recent study, Christophersen and Konradt (2011) have found high predictive validity, convergent validity and adequate reliability of single item measures compared to multiple item measures in research on the intention to buy online. They measure trust, aesthetics, usability of the online store and intention to buy, using both single and multiple items. Other studies support the use of a single item measurement construct (Robins et al., 2001; Drolet & Morrison, 2001; Jordan & Turner, 2008). Bergkvis and Rossiter (2007) find no difference in the predictive validity of multiple item and single item constructs. They measure attitude to advertising and attitude to brand using a single item and multiple items. In predicting attitude to a brand based on attitude to advertising, they found no difference in predictability. However, like Wanous and Reichers (1996), Wanous et al. (1997) argue for a multiple item construct to measure job satisfaction rather than a single item measure. These studies were challenged by Loo (2002) which finds that a single item is sufficient to measure 'simple and easy to understand' constructs. If a construct is multi-dimensional, multifaceted and complex, a single item construct might not be sufficient. Therefore, we use a single item construct for attitude and social acceptance. Since there are different facets to competencies, we used a multi-item construct for competencies (self-efficacy) and weighted competencies.

The pilot study collected data on variables 2 to 17 as per the list in Chapter 3, Table-3.5. Variables 18 to 22 were generated based on variables 8 -17 for the weighted competency construct. Table 3.5 presents the definition of the variables.

Table 3.5: Variables used in the Studies

| Variable No | Variable Name | Description | Variable Coding |
|---|---|---|---|
| 1 | Early Stage Entrepreneurial Activity | Involved in Early Stage Entrepreneurial Activity<br>Yes=1 & No=0 | Dependent Variable (Behaviour) |
| 2 | Entrepreneurial Career Intention | What career do you prefer for you?<br>Working for yourself = 1<br>All other = 0 | Dependent Variable (Intention) |
| 3 | Age | Age of the respondents | Demographic |
| 4 | Gender | Gender of the Respondents, Male= 1, Female=0 | Demographic |
| 5 | Parent | Either of your parents ever ran or is running a business.<br>For Pilot Study: yes =1; all other =0<br>For National Study: yes=1; all other =2 | Demographic |
| 7 point Likert scale used for variables 6-12 | | | |
| 6 | Attitude | Self-employment is better than working for others | Attitude |
| 7 | Status | Self-employment gives better social status than working for others | Subjective norms |
| 8 | Opportunity | I have some very good business ideas | Competency (self-efficacy) |
| 9 | Skill | I have sufficient knowledge and skill on starting and running a business | Competency (self-efficacy) |
| 10 | Fund | I have sufficient funds to start a business | Competency (self-efficacy) |
| 11 | Network | My friends, family members or the people known to me can help me to start a business | Competency (self-efficacy) |
| 12 | Independence | I do prefer to work independently | Competency (self-efficacy) |
| Maximum 100 value was allocated by the respondents to each of the variables 13-17 based on the importance of the variable for becoming an entrepreneur | | | |
| 13 | Value of opportunity | Importance of opportunity identification to be an entrepreneur | Value of Competency |
| 14 | Value of knowledge & skill | Importance of knowledge and skill to be an entrepreneur | Value of Competency |

| | | | |
|---|---|---|---|
| 15 | Value of finance | Importance of finance to be an entrepreneur | Value of Competency |
| 16 | Value of network | Importance of network to be an entrepreneur | Value of Competency |
| 17 | Value of independence | Importance of independence to be an entrepreneur | Value of Competency |
| Variable no 18-22, interaction between competency and weight of the respective competency | | | |
| 18 | Weighted Opportunity | Opportunity X weighted value of opportunity | Weighted Competency |
| 19 | Weighted Skill | Skill X weighted value of skill | Weighted Competency |
| 20 | Weighted Finance | Finance X weighted value of finance | Weighted Competency |
| 21 | Weighted Network | Network X weighted value of network | Weighted Competency |
| 22 | Weighted Independence | Independence X weighted value of independence | Weighted Competency |

We used a 7 point Likert scale for the attitude, social acceptance and competency variables, where 1 is strongly disagree, 7 strongly agree and 4 undecided. The survey asked respondents to assign values of up to 100 to each of the following competency variables to measure the power of these competencies based on their importance for being an entrepreneur. The variables are business knowledge and skill (value of skill), financing (value of fund), networking with people (value of network), business idea and opportunity (value of opportunity), and intention to be one's own boss (value of independence). To test our hypotheses, we generate weighted competency variables. First, we calculate the comparative weighted value of each competency following the ratio method (Jia et al., 1998). Secondly, we multiply competencies by the respective weighted value of the competencies.

We conducted two studies to test our hypotheses. We first ran a pilot study in a UK business school, followed by a national survey in a South Asian country. The pilot study of business students was to find out about their entrepreneurial intention. The national study

tested both intention and behaviour. In the national study, we added entrepreneurial behaviour questions to the pilot questionnaire. We have adopted the Global Entrepreneurship Monitor (GEM) definition of total early stage entrepreneurial activity (discussed in Chapter 4) to define entrepreneurial activity. Hypotheses 1 and 3 were tested in the pilot study, and all the hypotheses were tested in the national level study. Data collection, data analysis and the results of the study are provided separately for each study. The aim is not to find a relationship between intention and behaviour since the studies were cross sectional. In both studies, the main objectives were to i) establish a direct relationship between demographic variables and intention, and ii) test the influence of weighted competencies on entrepreneurial activity.

## 3.7 PILOT STUDY

### 3.7.1 Data:

Data were collected from 2nd and 3rd year undergraduate students in a UK business school. We visited the students' classrooms and distributed the questionnaire to 110 students telling them that participation in the survey was voluntary. Six students did not complete the questionnaire and are excluded from our analysis; another did not supply information on gender and, another six did not respond to the question about age (Tables-3.7 and 3.6).

Table 3.6: Age of the Respondents

| Age | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| | 18 | 1 | 1.0 | 1.0 | 1.0 |
| | 19 | 24 | 23.1 | 24.5 | 25.5 |
| | 20 | 21 | 20.2 | 21.4 | 46.9 |
| | 21 | 29 | 27.9 | 29.6 | 76.5 |
| | 22 | 13 | 12.5 | 13.3 | 89.8 |
| | 23 | 4 | 3.8 | 4.1 | 93.9 |
| | 24 | 2 | 1.9 | 2.0 | 95.9 |
| | 25 | 2 | 1.9 | 2.0 | 98.0 |
| | 26 | 1 | 1.0 | 1.0 | 99.0 |
| | 30 | 1 | 1.0 | 1.0 | 100.0 |
| | Total | 98 | 94.2 | 100.0 | |
| Missing | System | 6 | 5.8 | | |
| Total | | 104 | 100.0 | | |

We subsequently dropped age from the analysis since most of the respondents were aged between 19 and 22 (Table-3.6) and age was poorly correlated with other variables (Table-3.9). Before dropping age, we checked whether its exclusion made any significant changes to the results of the models as per the missing variable rule.

Table 3.7: Gender Distribution of the Respondents

| Gender | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| | Female = 0 | 45 | 43.3 | 43.7 | 43.7 |
| | Male = 1 | 58 | 55.8 | 56.3 | 100.0 |
| | Total | 103 | 99.0 | 100.0 | |
| Missing | System | 1 | 1.0 | | |
| Total | | 104 | 100.0 | | |

More than 50% of respondents said that one of their parents was self-employed. However, 70% of respondents intending to choose entrepreneurship as career had at least one parent who had their own business, while this percentage was 20 for respondents not intending to choose entrepreneurship as career.

A major difference in the attitudes of the respondents was observed. For those intending to choose entrepreneurship as a career, mean attitude on the 7 point scale is 5.75 (Table-3.8) and for those not intending to become entrepreneurs mean attitude is 3.85. Respondents intending to choose entrepreneurship as a career have a higher mean response than those not intending to choose entrepreneurship as a career, for all competencies except funding. However, the mean response for the value of competencies is interesting. Respondents intending to choose entrepreneurship as a career put a higher value on network and independence. Respondents not intending to choose entrepreneurship as career put a higher value on finance, business ideas and opportunities. The responses for the value of skill to be an entrepreneur were similar for both groups. To test our hypotheses, we generated five weighted competency variables by interacting competencies with their corresponding weights. Here, we calculate weight following the ratio method. The variables are i) Weighted Skill, ii) Weighted Finance, iii) Weighted Network, iv) Weighted Opportunity and v) Weighted Independence.

Table 3.8: Mean Responses based on Entrepreneurial Intention

| Variable | Total | | If entrepreneurial intention = 1 | | If entrepreneurial intention = 0 | |
|---|---|---|---|---|---|---|
| | Mean | SE | Mean | SE | Mean | SE |
| Parent | 0.54 | 0.049 | 0.71 | 0.056 | 0.23 | 0.072 |
| Gender | 0.56 | 0.049 | 0.60 | 0.060 | 0.49 | 0.086 |
| Skill | 4.35 | 0.132 | 4.71 | 0.150 | 3.66 | 0.224 |
| Fund | 2.79 | 0.172 | 2.93 | 0.216 | 2.51 | 0.291 |
| Network | 5.13 | 0.155 | 5.49 | 0.165 | 4.40 | 0.293 |
| Attitude | 5.11 | 0.145 | 5.75 | 0.143 | 3.83 | 0.194 |
| Opportunity | 4.74 | 0.143 | 5.16 | 0.152 | 3.94 | 0.259 |
| Status | 4.38 | 0.171 | 4.68 | 0.208 | 3.80 | 0.289 |
| Independence | 4.99 | 0.146 | 5.29 | 0.178 | 4.43 | 0.237 |
| Weighted Skill | 0.74 | 0.0246 | 0.80 | 0.027 | 0.63 | 0.0450 |
| Weighted Finance | 0.44 | 0.0295 | 0.45 | 0.037 | 0.41 | 0.0497 |
| Weighted Network | 0.92 | 0.0369 | 0.10 | 0.045 | 0.78 | 0.0593 |
| Weighted Opportunity | 0.913 | 0.0364 | 0.98 | 0.045 | 0.78 | 0.0591 |
| Weighted Independence | 0.69 | 0.0292 | 0.75 | 0.037 | 0.59 | 0.0434 |

For this interaction, we checked the independence of the variables as per the multiplication theorem by calculating the correlation of the variables. Variables 5, 6, 7, 9, and 11 in Table-3.9 are skill, fund, network, opportunity, and independence respectively; variables 12, 13, 14, 15, and 16 are value of skill, value of finance, value of network, value of opportunity, and value of independence. The correlations among the competencies and the corresponding values are .024, .108, .129, -.094, .059 and these weak correlations are insignificant (Table-3.9). The correlations among the coefficient of all the variables are less than 0.7. This shows that there is no possibility of multicollinearity. The rule–of-thumb for possibility of multicollinearity would remain if the correlation among the coefficients was more than 0.8.

Table 3.9: Pearson Correlations Matrix (Pilot Study)

| Variable No | 1.Age | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.Gender | .104 | - | | | | | | | | | | | | | |
| 3.Parent | .083 | .136 | - | | | | | | | | | | | | |
| 4.Entrepreneurial Career Intention | -.048 | .112 | .454** | - | | | | | | | | | | | |
| 5.Skill | .088 | .243* | .252* | .368** | - | | | | | | | | | | |
| 6.Fund | .129 | .261** | .199* | .111 | .330** | - | | | | | | | | | |
| 7.Network | .026 | .256** | .407** | .331** | .385** | .368** | - | | | | | | | | |
| 8.Attitude | .005 | .045 | .286** | .618** | .211* | .125 | .169 | - | | | | | | | |
| 9.Opportunity | .098 | .250* | .189 | .396** | .504** | .194* | .175 | .378** | - | | | | | | |
| 10.Status | -.093 | -.044 | .098 | .238* | .286** | .172 | .115 | .294** | .031 | - | | | | | |
| 11.Independence | -.106 | -.066 | .092 | .276** | .195* | -.138 | .046 | .318** | .253** | .177 | - | | | | |
| 12.Value of skill | .009 | -.117 | .130 | -.002 | .024 | -.011 | .109 | -.088 | -.130 | .000 | .113 | - | | | |
| 13.Value of finance | -.019 | -.121 | .071 | -.107 | -.038 | .108 | .016 | -.121 | -.222* | .020 | -.003 | .737** | - | | |
| 14.Value of network | .014 | -.126 | .095 | .113 | .129 | .001 | .129 | -.022 | -.061 | .059 | .055 | .618** | .588** | - | |
| 15.Value of opportunity | .034 | -.222* | .017 | -.098 | .070 | -.004 | .009 | -.094 | -.093 | .026 | .052 | .705** | .655** | .686** | - |
| 16.Value of independence | -.075 | -.159 | .140 | .038 | .214* | .188 | .064 | .035 | .059 | .079 | -.009 | .519** | .533** | .468** | .456** |

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Gender has a moderate correlation with skill, fund, network and opportunity, but is not correlated with entrepreneurial intention. Entrepreneurial intention has a strong significant correlation with parent's occupation, and attitude; and has a moderate significant correlation with all the competency variables. However, entrepreneurial intention is not correlated with the value of the competency variables (variables 12-16). There is a highly significant correlation among the values of competency variables which are i) value of Skill, ii) value of Finance, iii) value of Network, iv) value of Opportunity, and v) value of Independence. In all the models, entrepreneurial career intention is the dependent variable.

To test the hypotheses, we use logistic regression. We generate the models in two steps. In the first step, we used five competency variables and introduced demographic variables to analyse behaviour. In this stage, the competency variables explain respondents' own perceptions about their competencies to be entrepreneurs. In the second step, we considered the weighted competency value variables. To see the impact of demographic factors, we control for parents' occupation and gender variables in the model. We identify the impact of competency, value, competency value, and weighted competency value in the four steps as stated earlier. The outcomes of these steps are presented in Tables-3.10-3.12. The results of the hypotheses are summarised in Table-3.13.

### 3.7.2 Results of the Pilot Study

In the pilot study we tested hypotheses 1a, 2a and 2b and found support for both. The results show that the inclusion of demographic variables in the models increased the models fitness to explain variability in intention. The variable parents' entered the models as highly significant in Tables 3.10 and 3.11. However, gender is not significant in either model. In all the models,

attitude is positive and significant. Interestingly, in model 3 in Tables 3.10 and 3.11, when gender is included in the models, the coefficients of attitude and parents' self-employment are increasing. This suggests that although gender has no direct impact on intention, but it has an indirect impact. It indicates that males are more motivated by parents' profession, and have a more positive attitude towards an entrepreneurial career. These results provide partial support for hypothesis 1a. This study revealed that individual self-evaluation of competencies can explain more variation of intention than weighted competencies.

In Table-3.10, competencies enter model-3 with the other variables to give the adjusted $R^2$ of 0.54. The adjusted $R^2$ drops to 0.53 in model-3 if the weighted competencies are included (Table-3.11). Among competencies, skill and finance play a significant role in entrepreneurial intention. This provides partial support for hypothesis 2a. Skill enters in all the models with a positive coefficient while finance is negative. Network is marginally significant in model 2 (Table 3-10). If we include gender in model 3 (Table 3.10) network becomes insignificant. This shows that male respondents are influenced more by network in choosing entrepreneurship as a career. Table 3.11 shows that only weighted skill has a significant influence on entrepreneurial intention (model-2). However, when we control for gender, weighted finance enters the model as marginally significant with a negative sign. This reveals that the likelihood to choose entrepreneurship as career among male respondent declines because of (lack of) financing. Finance is significant in model-2 in Table 3.10, while weighted finance is insignificant in model-2 in Table 3.11. Both finance and weighted finance are significant in model 3 in Tables 3.10 and 3.11 respectively. This shows that the value of finance is more significant for male than female respondents for choosing entrepreneurship as a career. Thus, the results support hypotheses 2b partially.

Table 3.10: Step1- Logistic Regression Using Competency Variables (Self-Efficacy)

| VARIABLES | (1) Entrepreneurial Career Intention | (2) Entrepreneurial Career Intention | (3) Entrepreneurial Career Intention |
|---|---|---|---|
| Parent | | 1.935*** | 2.013*** |
| | | (0.744) | (0.721) |
| Gender | | | 0.738 |
| | | | (0.674) |
| Attitude | 1.263*** | 1.251*** | 1.336*** |
| | (0.304) | (0.320) | (0.352) |
| Status | 0.0846 | 0.163 | 0.190 |
| | (0.201) | (0.228) | (0.222) |
| Independence | 0.174 | 0.184 | 0.202 |
| | (0.241) | (0.261) | (0.257) |
| Skill | 0.431 | 0.556* | 0.588* |
| | (0.285) | (0.304) | (0.310) |
| Finance | -0.328 | -0.420* | -0.490* |
| | (0.225) | (0.243) | (0.264) |
| Network | 0.638** | 0.466* | 0.454 |
| | (0.274) | (0.279) | (0.287) |
| Opportunity | 0.293 | 0.262 | 0.218 |
| | (0.264) | (0.334) | (0.338) |
| Constant | -11.91*** | -12.38*** | -13.13*** |
| | (3.093) | (3.523) | (4.067) |
| $R^2$ | 0.4758 | 0.5370 | 0.5442 |
| Observations | 102 | 102 | 102 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The pseudo $R^2$ declines to .5322 in Table 3.11 from .5442 in Table 3.10, for model 3. This shows that competencies explain more of the variation in intention than weighted competencies. However, in a bigger study with more diverse respondents, the results might be different and the variation will be higher. Since this pilot study was run among the same background business

students group, it is expected that they were aware of their required competencies to be an entrepreneur.

Table 3.11: Step 2- Logistic Regression Using Weighted Competency Variables

| VARIABLES | (1) Entrepreneurial Career Intention | (2) Entrepreneurial Career Intention | (3) Entrepreneurial Career Intention |
|---|---|---|---|
| Parent | | 2.115*** | 2.227*** |
| | | (0.785) | (0.753) |
| Gender | | | 0.890 |
| | | | (0.857) |
| Attitude | 1.293*** | 1.283*** | 1.381*** |
| | (0.358) | (0.373) | (0.382) |
| Status | 0.0658 | 0.117 | 0.153 |
| | (0.152) | (0.188) | (0.189) |
| Weighted Skill | 2.372* | 2.948** | 2.918** |
| | (1.426) | (1.477) | (1.459) |
| Weighted Finance | -0.575 | -1.446 | -2.035* |
| | (0.844) | (1.047) | (1.137) |
| Weighted Network | 2.430* | 1.446 | 1.395 |
| | (1.249) | (1.205) | (1.168) |
| Weighted Opportunity | 0.217 | 0.405 | 0.209 |
| | (0.925) | (1.166) | (1.182) |
| Weighted Independence | 1.115 | 0.474 | 0.669 |
| | (1.379) | (1.520) | (1.721) |
| Constant | -10.26*** | -10.31*** | -11.15*** |
| | (2.804) | (2.312) | (2.708) |
| $R^2$ | 0.4544 | 0.5234 | 0.5322 |
| Observations | 103 | 103 | 103 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The influence of skill and weighted skill increases in model-2 (Table 3.10) and model-3 (Table 3.11). The level of significance for skill in model-1 is $p < .10$ while the level of significance for skill in models-2 and 3 is $p < .05$. We assume that social acceptance of entrepreneurship as a career will have a positive impact on choosing entrepreneurship as career. However, it enters the model positively with an insignificant result. For those interested in choosing entrepreneurship as a career, the mean response for status is 4.68, and for those not interested in choosing entrepreneurship as career, the mean response is 3.8. We observe a difference in the mean responses of the two groups. However, in order to decide whether to retain status in the model we need a larger sample size. The results for the hypotheses are summarised in Table 3.12.

Table 3.12: Result of the Hypotheses

| Hypothesis No | Hypothesis | Result |
|---|---|---|
| 1a | Demographic factors have significant impact on entrepreneurial intention. | + |
| 2a | Competencies will have significant influence on entrepreneurial intention. | + |
| 2b | Weighted competencies have a significant influence on entrepreneurial intention. | + |

This pilot study was conducted among 110 second and third year undergraduate students in a business school in the UK in the academic year 2010-2011, to study entrepreneurial intention. The pilot study reveals the significant influence of demographic and competency variables. This

is tested further in a national level study. Section 3.8 describes the national level study which tested the hypotheses among a representative random national sample.

## 3.8 NATIONAL LEVEL STUDY

### 3.8.1 Data:

Data were collected from 2,000 respondents through an extensive random field survey in all seven administrative divisions of Bangladesh, administered in April 2011 to July 2011 by the Bangladesh GEM research team. Respondents were selected randomly from urban and rural areas of the divisions, maintaining the population percentage as per the latest population census of the country. In the sampling process, we randomly identified 400 sampling points, 100 from urban areas and 300 from rural areas, with the help of electoral rolls pertaining to the sample municipal ward/village across the country. Our selection of starting points retains the geographical dispersion considered. We interviewed five individuals from each starting point. Around each randomly selected starting point, we contacted and interviewed five households based on skipping the four intervening households (i.e. interviewing every $5^{th}$ household from the starting point). We listed the names of all household members in the selected households, in descending order of age. Serial numbers were assigned to household members aged over 17 years in descending order of age, i.e. starting with the oldest member of the family and going down to the member aged 17. One of these adults was randomly selected using the KISH table (Kish, 2004; Kish, 1965). If the respondent was not at home, up to three return calls were made according to the time available; if the member was still not available, the next fifth household from the last contacted household was contacted to randomly select another respondent. Fifty per cent of respondents were female.

3.8.1.1 Data Characteristics:

The average age of the respondents was 36 with a standard deviation (SD) of 12. Some 50% of respondents were aged between 18 and 34 years (Table-3.13).

**Table 3.13: Age of the Respondents**

| Age Group | Freq. | Percent | Cum. |
|---|---|---|---|
| 18-24 | 379 | 18.95 | 18.95 |
| 25-34 | 598 | 29.9 | 48.85 |
| 35-44 | 494 | 24.7 | 73.55 |
| 45-54 | 291 | 14.55 | 88.1 |
| 55-64 | 170 | 8.5 | 96.6 |
| 65-120 | 68 | 3.4 | 100 |
| Total | 2,000 | 100 | |

Some 37% of the respondents said that one of their parents was self-employed. The mean responses (Table-3.14) indicate that most respondents strongly preferred to work independently (Independence: 6.24). They also agreed that self-employment was better than working for an employer (attitude: 5.66) and provides higher social status than working for a boss (social status: 5.45). However, respondents disagreed that they had sufficient funds to start a business (fund: 3.61) and agreed to some extent that they had available external financing (external financing: 4.46). We did not ask whether this external finance was from a formal or an informal source. Respondents also agreed that they had a good business idea or opportunity (opportunity: 4.48) with SD 1.9 which indicates some respondents could recognise a good business opportunity and some could not.

Table 3.14: Pearson Correlations Matrix (National Study)

| | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.E.Ent Activity | .12 | .324 | 1 | | | | | | | | | | | | | | | | |
| 2. Entrepreneurial Career Intention | .5610 | .49639 | .278** | 1 | | | | | | | | | | | | | | | |
| 3.Age | 36.22 | 12.923 | -.023 | .075** | 1 | | | | | | | | | | | | | | |
| 4.Gender | .50 | .50013 | .232** | .334** | .197** | 1 | | | | | | | | | | | | | |
| 5.Parent | 1.63 | .482 | -.072** | -.081** | .052** | -.036 | 1 | | | | | | | | | | | | |
| 6.Social Status | **5.45** | 1.673 | .030 | .234** | .014 | .101** | -.018 | 1 | | | | | | | | | | | |
| 7.Attitude | **5.66** | 1.534 | .092** | .283** | .027 | .131** | -.034 | .641** | 1 | | | | | | | | | | |
| 8.Knowledge & Skill | 4.55 | 2.160 | .280** | .464** | .041* | .457** | -.127** | .182** | .280** | 1 | | | | | | | | | |
| 9.Fund | 3.51 | 1.924 | .212** | .167** | .016 | .197** | -.054** | .100** | .159** | .349** | 1 | | | | | | | | |
| 10.Network | 4.13 | 1.840 | .129** | .113** | -.042* | .174** | -.055** | .105** | .149** | .271** | .449** | 1 | . | | | | | | |
| 11.Opportunity | 4.48 | 1.902 | .293** | .467** | .046* | .464** | -.113** | .178** | .248** | **.707**** | .286** | .270** | 1 | | | | | | |
| 12.External Financing | 4.46 | 1.773 | .206** | .164** | -.051* | .211** | -.033 | .170** | .180** | .323** | .589** | .502** | .351** | 1 | | | | | |
| 13.Independence | **6.24** | .980 | .114** | .161** | -.042* | .112** | -.046* | .164** | .267** | .231** | .131** | .089** | .235** | .208** | 1 | | | | |
| 14.Weighted Skill | .78 | .38571 | .276** | .451** | .039* | .431** | -.109** | .172** | .263** | **.962**** | .345** | .255** | .670** | .311** | .203** | 1 | | | |
| 15.Weighted Finance | .60 | .34336 | .175** | .144** | .023 | .170** | -.045* | .085** | .143** | .297** | **.952**** | .423** | .238** | .550** | .099** | .298** | 1 | | |
| 16.Weighted Network | .71 | .33680 | .124** | .081** | -.045* | .157** | -.053** | .092** | .132** | .234** | .401** | **.937**** | .231** | .468** | .085** | .207** | .373** | 1 | |
| 17.Weighted Opportunity | .71 | .31700 | .288** | .450** | .038* | .421** | -.106** | .167** | .232** | **.664**** | .254** | .260** | **.946**** | .334** | .211** | **.612**** | .186** | .219** | 1 |
| 18.Weighted Independence | **1.02** | .26637 | .059** | .113** | -.040* | .083** | -.061** | .208** | .258** | .175** | .110** | .078** | .169** | .135** | **.659**** | .088** | .027 | .009 | .124** |

*. Correlation is significant at the 0.05 level. **. Correlation is significant at the 0.01 level.

The correlation matrix (Table-3.14) shows that competencies have a strong correlation with weighted competencies, which is desirable. In this situation, a perfect or low correlation is undesirable. Since we are using competency variables and weighted competency variables as independent variables in separate models, this will not create any multicollinearity problems. However, the strong correlation (.707) between knowledge and skill and business opportunity raises the possibility of the existence of collinearity. To avoid confusion about probable collinearity problems in the regression model we calculate Variance Inflation Factor (VIF) and Tolerance to check for collinearity of all the independent variables in the weighted and unweighted models separately.

Table 3.15: Variance Inflation Factor (VIF) & Tolerance Calculation of competency Models

| Variable | VIF | SQRT VIF | Tolerance | R-Squared | Eigen value | Condition Index |
|---|---|---|---|---|---|---|
| Parent | 1.02 | 1.01 | 0.9774 | 0.0226 | 10.624 | 1 |
| Age | 1.06 | 1.03 | 0.9419 | 0.0581 | 0.4688 | 4.7604 |
| Gender | 1.39 | 1.18 | 0.7182 | 0.2818 | 0.2638 | 6.3459 |
| Social Status | 1.72 | 1.31 | 0.583 | 0.417 | 0.1601 | 8.1458 |
| Attitude | 1.85 | 1.36 | 0.54 | 0.46 | 0.1117 | 9.7515 |
| Knowledge &_Skill | 2.24 | 1.5 | 0.4464 | 0.5536 | 0.0866 | 11.0737 |
| Fund | 1.68 | 1.3 | 0.5957 | 0.4043 | 0.0641 | 12.8762 |
| Network | 1.43 | 1.2 | 0.6995 | 0.3005 | 0.046 | 15.1955 |
| Opportunity | 2.2 | 1.48 | 0.4548 | 0.5452 | 0.0387 | 16.5704 |
| Independence | 1.14 | 1.07 | 0.877 | 0.123 | 0.0254 | 20.4661 |

VIF measures the impact of collinearity among the variables in a regression model. As a rule-of-thumb, a VIF value of a variable of 10 or less indicates that there are no collinearity problems. Here, the VIF values for all the variables are less than 2.5. So, there is no collinearity problem in the independent variables (Tables-3.15 and 3.16).

Table 3.16: Variance Inflation Factor (VIF) & Tolerance Calculation of Weighted Competency Models

| Variable | VIF | SQRT VIF | Tolerance | R-Squared | Eigen value | Condition Index |
|---|---|---|---|---|---|---|
| Parent | 1.02 | 1.01 | 0.9778 | 0.0222 | 10.5156 | 1 |
| Age | 1.06 | 1.03 | 0.9412 | 0.0588 | 0.4682 | 4.7392 |
| Gender | 1.36 | 1.16 | 0.7375 | 0.2625 | 0.2734 | 6.202 |
| Social Status | 1.72 | 1.31 | 0.5821 | 0.4179 | 0.1758 | 7.7345 |
| Attitude | 1.83 | 1.35 | 0.5452 | 0.4548 | 0.1345 | 8.8411 |
| Weighted Skill | 1.83 | 1.35 | 0.5479 | 0.4521 | 0.0875 | 10.9642 |
| Weighted Finance | 1.54 | 1.24 | 0.6495 | 0.3505 | 0.0755 | 11.8045 |
| Weighted Network | 1.33 | 1.16 | 0.7491 | 0.2509 | 0.0606 | 13.1726 |
| Weighted Opportunity | 1.78 | 1.33 | 0.5625 | 0.4375 | 0.0573 | 13.5441 |
| Weighted Independence | 1.1 | 1.05 | 0.9064 | 0.0936 | 0.0261 | 20.0755 |

Tolerance value is the inverse of VIF. A tolerance value close to zero indicates that there is problem of multicollinearity. The tolerance value for all the variables shows that there are no serious concerns (Tables-3.15 and 3.16). In addition, as per the condition indices measure, if the value of the variable condition indices is more than 30, there is a possibility of multicollinearity. The calculation shows we should not be concerned although some of the Eigen values are close to zero. The condition indices of all the variables are less than 30.

### 3.8.2 Models:

We tested our hypotheses in eight stepwise logit regressions – four for entrepreneurial career intention, and four for early stage entrepreneurial activity (behaviour). Since the behaviours of early stage entrepreneurs and established entrepreneurs are different, we consider the GEM definition of entrepreneurial activity. In the models, we control for attitude and social status. Direct impacts of demographic variables are tested in equations 2 and 6.

To test the influence of the competency variables (self-efficacy) and the weighted competency variables we run four equations –3 and 7 for competency, and 4 and 8 for weighted competency variables. To run the equations we used the logit regression model since our dependent variables are dichotomous and the characteristics of the independent variables are mixed. The results of the logit regressions are given in Tables-3.17 and 3.18.

To test the hypotheses we used the Wald test. We tested the joint influence of demographic variables for hypotheses 1a and 1b. To test the hypotheses 2a and 2b, we tested the joint influence of competency variables and for hypotheses 3a and 3b we tested the joint influence of weighted competency variables.

3.8.2.1 Comparing Models:

Unlike linear regressions, Pseudo R2 of logit or logistic regression gives only a preliminary indication of model predictability. In the pilot study, we used pseudo R2 to compare the models. However, to test our hypotheses, we need to compare the models using some additional information criteria for model robustness and goodness of fit. We use the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). These criteria can be used to compare nested or non-nested models. If the models were nested, this would add complexity to the models. There are some limitations to AIC; to overcome these, corrected AIC (AICc) is used in our analysis.

Formula for Calculating AIC, AICc & BIC:

Akaike's Information Criterion (AIC) = -2*log-likelihood+2*$k$

Corrected AICc=

$$AIC_c = -2(\text{log-likelihood}) + 2K + \frac{2K(K+1)}{(n-K-1)}$$

Where *k* is the number of the estimated parameters and n is the sample size.

The Bayesian Information Criterion (BIC) = -2*log-likelihood + *k**log(*n*) where *k* is the number of estimated parameters and *n* is the sample size.

The minimum values of AICc and BIC help to identify the true model or the model with the best fit (Anderson 2008; Burnham & Anderson 2002). We used the delta AIC (∆i) and Akaike weights (Wi) criteria in AIC analysis. Delta AIC is a measure of each model relative to the optimal model. According to Burnham and Anderson (2002), as a rule of thumb, a value of delta AIC less than 2 suggests that there is a substantial support for the model, values between 3 and 7 indicate that the model is less well supported, and a value of delta AIC of more than 10 indicates that the model is not robust. Thus, we dropped models 1, 2, 6 and 7 from our analysis. The evidence ratio (Burnham & Anderson 2002) in Tables-3.20 and 3.21 shows how frequently the model is inferior to the best model. Evidence Ratio = Wj / Wi, where model j is compared to model i (the best model).

### 3.8.3 Results of the National Study

The results show that demographic variables are highly significant for entrepreneurial intention and activity (behaviour) when we control for attitude and social status. Table 3.17 and Table 3.18 show that all three demographic variables are highly significant for explaining

entrepreneurial intention (model-2) and entrepreneurial activity (model-7). Wald tests of joint influence of demographic variables in entrepreneurial intention (table 3.17(1) and table 3.17(2)), and entrepreneurial activity (table 3.18(1) and table 3.18(2)) show that demographic variables have a highly significant influence on both entrepreneurial intention and entrepreneurial activity. This supports hypothesis-1a and 1b, which predicts that demographic factors have a significant impact on entrepreneurial intention and activity. This also helps us to achieve the overall objective of the study, which is to improve entrepreneurship behaviour theory. The results prove that demographic variables are highly important for the entrepreneurial intention and behaviour analysis. So, inclusion of demographic variables in the behaviour analysis will improve the theories in entrepreneurship behaviour analysis.

The chi-square test values of demographic variables in model 3 and model 4 in table 3.17(1) and 3.17(2) are 39.0 and 44.97 respectively. This explains that model 4, which is a weighted competency model, explains a better relationship between demographic variables and entrepreneurial intention. Among the demographic variables, parents' self-employment enters the models (model 2 and 6) with a negative sign in table 3.17 and 3.18. This explains that the likelihood of entrepreneurial intention and activity is higher among individuals where neither parent is self-employed than among those with at least one parent who is self-employed. However, the influence of the 'parent' variable disappears when we consider behavioural control variables in the model, in relation to both intention and activity. Earlier studies find a positive influence of parents' self-employment on entrepreneurship in the UK (Henley, 2007), but our study in the context of Bangladesh shows a negative influence of parents' self-employment on entrepreneurial intention. This implies that the influence of parent's self-employment in entrepreneurship cannot be generalised.

Table: 3.17 Logit Regressions for Entrepreneurial Career Intention (National Study)

| VARIABLES | (1) Entrepreneurial Career Intention | (2) Entrepreneurial Career Intention | (3) Entrepreneurial Career Intention | (4) Entrepreneurial Career Intention |
|---|---|---|---|---|
| Parent | | -0.346*** | -0.149 | -0.179 |
| | | (0.105) | (0.114) | (0.114) |
| Age | | 0.117*** | 0.0906*** | 0.0920*** |
| | | (0.0215) | (0.0237) | (0.0238) |
| Age_square | | -0.00140*** | -0.00103*** | -0.00105*** |
| | | (0.000260) | (0.000286) | (0.000286) |
| Gender | | 1.414*** | 0.629*** | 0.684*** |
| | | (0.104) | (0.121) | (0.119) |
| Social Status | .116*** | 0.119*** | 0.135*** | 0.135*** |
| | (0.0363) | (0.0388) | (0.0432) | (0.0427) |
| Attitude | .320*** | 0.289*** | 0.185*** | 0.189*** |
| | (0.0411) | (0.0438) | (0.0478) | (0.0472) |
| Competencies (self –Efficacy): | | | | |
| Knowledge_Skill | | | 0.235*** | |
| | | | (0.0355) | |
| Fund | | | 0.00185 | |
| | | | (0.0332) | |
| Network | | | -0.0769** | |
| | | | (0.0350) | |
| Opportunity | | | 0.298*** | |
| | | | (0.0403) | |
| Independence | | | 0.0332 | |
| | | | (0.0536) | |
| Weighted Competencies: | | | | |
| Weighted Skill | | | | 1.356*** |
| | | | | (0.183) |
| Weighted Finance | | | | 0.123 |
| | | | | (0.179) |
| Weighted Network | | | | -0.504*** |
| | | | | (0.182) |
| Weighted Opportunity | | | | 1.812*** |
| | | | | (0.227) |
| Weighted Independence | | | | 0.113 |
| | | | | (0.230) |
| Constant | -2.201*** | -4.287*** | -5.622*** | -5.512*** |
| | (0.207) | (0.488) | (0.618) | (0.583) |
| Pseudo R2 | 0.0637 | 0.1493 | 0.2411 | 0.2441 |
| Observations | 2,000 | 2,000 | 2,000 | 2,000 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Age and gender enter the intention models as highly significant and positive, even when we include the competency and weighted competency variables in model 3 and model 4 in table 3.17. Age_square enters the model with a negative sign. This points to an inverse U shaped

relationship between age and entrepreneurial career intention. In entrepreneurial activity, age is highly significant in model 6 in table 3.18. But this significant influence disappears in model 7 and model 8 when we bring competencies and weighted competencies variables into the model. Gender is highly significant in all of the models and with a positive sign in both entrepreneurial intention and entrepreneurial activity. This implies that men are more oriented than women towards entrepreneurship in Bangladesh.

Table 3.17(1): (i) Joint Effect of Demographic Variables, and (ii) the Joint Effect of Competency Variables in Entrepreneurial Intention

| Model No and Effect | Entrepreneurial Intention | Result of Wald Test |
|---|---|---|
| 3.i | Parent<br>Age<br>Gender | $X^2 = 39.0$<br>Prob > $X^2$ =.000 |
| 3.ii | Skill<br>Finance<br>Network<br>Opportunity<br>Independence | $X^2 = 221.27$<br>Prob > $X^2$ =.000 |

Table 3.17(2): (i) Joint Effect of Demographic Variables, and (ii) the Joint Effect of Weighted Competency Variables in Entrepreneurial Intention

| Model No and Effect | Entrepreneurial Intention | Result of Wald Test |
|---|---|---|
| 4.i | Parent<br>Age<br>Gender | $X^2 = 44.97$<br>Prob $X^2$ > .000 |
| 4.ii | Weighted Skill<br>Weighted Finance<br>Weighted Network<br>Weighted Opportunity<br>Weighted Independence | $X^2 = 226.06$<br>Prob > $X^2$ =.000 |

Social status is highly significant ($p<0.01$) for both entrepreneurial career intention and entrepreneurial activity. The variable is positive in the intention models, but negative in the entrepreneurial activity models. This may be because those who are intending to become entrepreneurs can see the social status of other entrepreneurs; on the other hand, those who are trying to be an entrepreneur do face various administrative and bureaucratic barriers. Attitude is highly significant ($p<0.01$) in all the career intention models. The influence of attitude

on intention is stable in all the intention models. In the entrepreneurial activity models, attitude is significant in models 5 and 6. However, attitude becomes insignificant for the remaining entrepreneurial activity models when behavioural control variables are introduced. The explanatory influence of attitude may be being exploited by the behavioural control variables in models 7 and 8. This might explain why previous work (Ajzen & Fishbein, 1977; Wicker, 1969) fails to find a relationship between attitude and specific and contextual behaviour. Attitude seems to influence entrepreneurial activity through other cognitive and competency variables.

The wald test of competency variables in table 3.17(1) shows that the joint effect of competency variables in entrepreneurial intention is highly significant ($X^2$ = 221.27; Prob > $X^2$ =.000). In table 3.17(2) the result of the wald test for the joint effect of weighted competency variable in entrepreneurial intention is also highly significant ($X^2$ = 226.06; Prob > $X^2$ =.000). These prove our hypotheses both 2a and 2b. Hypothesis 2a states that competencies have a significant influence on entrepreneurial intention. On the other hand, hypothesis 2b states that weighted competencies have significant influence on entrepreneurial intention. In the results, in table 3.17, 3.17(1) and 3.17(2) we observed that both competency and weighted competencies have highly significant influence upon entrepreneurial intention. However, the chi-square test value of the weighted competencies (226.06) in table 3.17(2) is slightly higher than the chi-square tests value of competencies (221.27) in the table 3.17(1). This indicates that weighted competencies explain the entrepreneurial intention slightly better than the competencies.

Table: 3.18 Logit Regression for Early stage Entrepreneurial Activity (National Study)

| VARIABLES | (5) Early Stage Ent.Activity | (6) Early Stage Ent.Activity | (7) Early Stage Ent.Activity | (8) Early Stage Ent.Activity |
|---|---|---|---|---|
| Parent | | -0.402*** | -0.190 | -0.197 |
| | | (0.145) | (0.156) | (0.156) |
| Age | | 0.0752** | 0.0475 | 0.0485 |
| | | (0.0346) | (0.0440) | (0.0451) |
| Age_square | | -0.00115*** | -0.000814 | -0.000823 |
| | | (0.000435) | (0.000569) | (0.000587) |
| Gender | | 1.722*** | 0.841*** | 0.907*** |
| | | (0.178) | (0.202) | (0.198) |
| Social Status | -0.091* | -0.132** | -0.129** | -0.148** |
| | (0.0526) | (0.0566) | (0.0592) | (0.0593) |
| Attitude | .289*** | 0.254*** | 0.0813 | 0.103 |
| | (0.0666) | (0.0705) | (0.0718) | (0.0733) |
| Competencies (self –Efficacy): | | | | |
| Knowledge_Skill | | | 0.255*** | |
| | | | (0.0575) | |
| Fund | | | 0.180*** | |
| | | | (0.0423) | |
| Network | | | 0.00736 | |
| | | | (0.0491) | |
| Opportunity | | | 0.448*** | |
| | | | (0.0697) | |
| Independence | | | 0.0997 | |
| | | | (0.0992) | |
| Weighted Competencies: | | | | |
| Weighted Skill | | | | 1.698*** |
| | | | | (0.290) |
| Weighted Finance | | | | 0.822*** |
| | | | | (0.227) |
| Weighted Network | | | | 0.348 |
| | | | | (0.272) |
| Weighted Opportunity | | | | 2.579*** |
| | | | | (0.361) |
| Weighted Independence | | | | 0.370 |
| | | | | (0.323) |
| Constant | -3.189*** | -4.274*** | -7.738*** | -7.621*** |
| | (0.346) | (0.747) | (1.120) | (1.027) |
| Pseudo R2 | 0.0152 | 0.1055 | 0.2132 | 0.2146 |
| Observations | 2,000 | 2,000 | 2,000 | 2,000 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3.18(1): (i) Joint Effect of Demographic Variables, and (ii) the Joint Effect of Competency Variables in Entrepreneurial Activity

| Model No and Effect | Entrepreneurial Activity | Result of Wald Test |
|---|---|---|
| 7.i | Parent<br>Age<br>Gender | $X^2 = 21.24$<br>Prob > $X^2$ =.000 |
| 7.ii | Skill<br>Finance<br>Network<br>Opportunity<br>Independence | $X^2 = 113.58$<br>Prob > $X^2$ = .000 |

Table 3.18(2): (i) Joint Effect of Demographic Variables, and (ii) the Joint Effect of Weighted Competency Variables in Entrepreneurial Activity

| Model | Entrepreneurial Activity | Result of Wald Test |
|---|---|---|
| 8.i | Parent<br>Age<br>Gender | $X^2 = 25.01$<br>Prob $X^2$ > .000 |
| 8.ii | Weighted Skill<br>Weighted Finance<br>Weighted Network<br>Weighted Opportunity<br>Weighted Independence | $X^2 = 114.67$<br>Prob $X^2$ > .000 |

Among the competency variables, knowledge and skill, network, and opportunity have a significant influence on entrepreneurial career intention. Funding and independence are not significant. However, network enters the models with a negative coefficient. This implies that a network of family members and friends who can offer support for the start-up process does not encourage choice of entrepreneurship as career. The weighted competency variables have a similar influence on career intention although the magnitude of the coefficients is different. This result is expected since the competency variables and weighted competency variables are strongly correlated. The main difference is the level of significance of the network and weighted

network variables. While network is significant at $p<0.05$ and $p<.1$ in models 3 and 5 (un-weighted models) respectively, weighted network is significant at $p<.01$ and $p<.05$ in models 4 and 6 (weighted models) respectively.

The wald test results of the influence of competencies and weighted competencies in entrepreneurial activity in table 3.18(1) and 3.18(2) respectively show both competencies and weighted competencies have a highly significant influence on entrepreneurial activity. The chi-square test result for weighted competencies ($X^2 = 114.67$ Prob $X^2 > .000$) is slightly higher than the chi-square test result of competencies ($X^2 = 113.58$; Prob $> X^2 = .000$) in entrepreneurial activity. This indicates that weighted competencies can slightly better explain the entrepreneurial activity than the competencies.

In the entrepreneurial activity models, model 8, weighted skill, weighted finance and weighted opportunity are highly significant, with business opportunity showing the highest level of influence on entrepreneurial activity among all the weighted competency variables. Weighted independence and weighted network are insignificant for explaining early stage entrepreneurial behaviour. In the unweighted model 7, skill, finance, and opportunity are highly significant, like the weighted competencies in model 8. Network and independence are insignificant in these models. The results of the study are presented in Table 3.19.

Table 3.19: Result of the Hypotheses (National Study)

| Hypothesis No | Hypothesis | Result |
|---|---|---|
| 1a | ***Demographic factors have a significant impact on entrepreneurial intention.*** | + |
| 1b | ***Demographic factors have a significant impact on entrepreneurial activity.*** | + |
| 2a | ***Competencies have a significant influence on entrepreneurial intention.*** | + |
| 2b | ***Weighted competencies have a significant influence on entrepreneurial intention.*** | + |
| 3a | ***Competencies have a significant influence on entrepreneurial activity.*** | + |
| 3b | ***Weighted competencies have a significant influence on entrepreneurial activity.*** | + |

AICc and BIC calculations identify that inclusion of weighted competency variables increases model fitness for explaining entrepreneurial intention and behaviour or activity. Table-3.20 shows that model-4 provides the best explanation for entrepreneurial career intention among the four career intention models analysed (model 1-4), and Table-3.21 shows that model-8 provides the best explanation for early stage entrepreneurial activity among the four early stage entrepreneurial activity models (models 5-8). AICc and BIC are lowest in model-4 and model-8 for entrepreneurial intention and activity respectively (Tables 3.20 and 3.21).

AICc and BIC calculations of entrepreneurial activity models (models 5-8) in Table-3.21 indicate that model-8 is the most appropriate model to analyse entrepreneurial activity. Model-8 is the weighted competency model. Delta AIC ($\Delta i$) in Table-3.21 shows that model 7 is the only candidate model for the comparison. The evidence ratio in Table-3.21 shows that the weighted competency based model for entrepreneurial activity (model 8) is some three times better than

the competency based (self-efficacy) model (model-7) for explaining entrepreneurial activity and behaviour. We know that lower AIC and BIC values and lower delta AIC ($\Delta$i) give a better model fit; model 8 is better than model 7. The AICc and BIC values are lower in model-4 than model-3 meaning model-4 is better fitted than model 3 for explaining entrepreneurial intention.

The result reveals an important exception to the influence of network in entrepreneurial intention. Earlier studies found that network has a significantly positive influence in entrepreneurial intention. But this study has revealed that network (-0.504***) has significant negative influence in entrepreneurial intention. In addition to this, this study has found that parent's self-employment (-0.346***) has also a significant negative influence in entrepreneurial intention. These findings reveal that reference group (parent, friends, network) is negatively influencing the entrepreneurial intention of respondents in Bangladesh. This has made a question toward the generalisability of the influence of parent and network in entrepreneurship. This is an important finding for the development of entrepreneurship development theory. Thus, in turn, helps us to achieve the overall objective of the study.

Table 3.20: AICc and BIC for Career Intention (National Study)

| Model No | Obs | Log pseudo likelihood | df | AIC | (2*K*(K+1)) / (n-K-1) | AICc | Δi | exp(-0.5*Δi) | *wi* | *Evidence Ratio* | BIC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2000 | -1284.038 | 3 | 2574.076 | 0.03009 | 2574.106 | 476.635 | 1.057E-108 | 1.057E-108 | x | 2590.878 |
| 2 | 2000 | -1166.583 | 7 | 2347.166 | 0.056225 | 2347.222 | 249.751 | 1.96E-59 | 4.33E-55 | x | 2386.372 |
| 3 | 2000 | -1040.768 | 12 | 2105.536 | 0.157021 | 2105.693 | 8.222 | 5.48E-07 | 5.48E-07 | 1.82483E+06 | 2172.747 |
| ***4*** | ***2000*** | ***-1036.657*** | ***12*** | ***2097.314*** | ***0.157021*** | ***2097.471*** | ***0*** | ***1*** | ***3.34E-05*** | ***-*** | ***2164.525*** |
| | | | | | | | ∑exp(-0.5*Δi)= | 1.00003E+00 | | | |

Table 3.21: AICc and BIC for Entrepreneurial Activity (National Study)

| Model No | Obs | Log pseudo likelihood | df | AIC | (2*K*(K+1)) / (n-K-1) | AICc | Δi | exp(-0.5*Δi) | *wi* | *Evidence Ratio* | BIC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 2000 | -718.758 | 3 | 1443.516 | 0.03009 | 1443.546 | 272.861 | 5.61E-60 | 4.122E-59 | x | 1460.319 |
| 6 | 2000 | -652.831 | 7 | 1319.662 | 0.056225 | 1319.718 | 149.033 | 4.34E-33 | 3.1919E-33 | x | 1358.868 |
| 7 | 2000 | -574.283 | 12 | 1172.566 | 0.157021 | 1172.723 | 2.038 | 3.61E-01 | 0.26522222 | 2.77 | 1239.777 |
| ***8*** | ***2000*** | ***-573.264*** | ***12*** | ***1170.528*** | ***0.157021*** | ***1170.685*** | ***0*** | ***1*** | ***0.73477772*** | - | ***1237.739*** |
| | | | | | | | ∑exp(-0.5*Δi)= | 1.360956 | | | |

### 3.9 DISCUSSION:

This study has identified that demographic variables have a direct influence on both entrepreneurial intention and behaviour. When we controlled for attitude, this influence did not change. This finding nullifies one of the fundamental assumptions in TPB. The main argument in TPB is that the influence of demographic variables is captured by the variable for attitude. Ajzen (2011, p. 123) argues that demographic variables such as age, gender, family background, education, media, etc. are all captured by attitude. These demographic variables have an indirect influence on intention and behaviour through attitude. Earlier studies show that demographic variables have a direct relationship with intention and behaviour (Blanchflower & Oswald, 1998; Henley 2007), however they do not test for whether attitude absorbs the influence of demographic variables on entrepreneurial intention and activity. To understand this, it is important to control for attitude when identifying the relationship between demographic variables and entrepreneurial intention and activity. In our study we tested the relationship controlling for attitude. This is an important contribution to improve the theory and to achieve the overall objective of the study.

Our study shows that attitude cannot absorb all the direct influences of demographic variables. We found that the influence of demographic variables remains highly significant for intention and behaviour when controlling for attitude. In our study, we considered the demographic variables of age, gender, and parent's self-employment. We found that the influences of demographic variables change when behavioural control variables enter into the models. The influence of parent's self-employment becomes insignificant when behavioural control variables enter the models. Gender has a direct influence in all the models. The direct influence of age remains significant in all the entrepreneurial intention models. However, this influence is

subsumed by the behavioural control variables in relation to entrepreneurial activity. The influence of age square was insignificant in model 6. This reveals that young adults give more biased responses than other age groups on their competencies or self-efficacy.

Both pilot and national study show that competency and weighted competency have a significant influence on entrepreneurial intention and activity. The national level study identified that weighted competency provides a better explanation of intention and entrepreneurial activity, while the pilot study showed that self-efficacy or competency gives a better explanation of entrepreneurial intention. These different results may be the result of the sample used for the pilot study which was taken from a group of students in a UK business school. It can be assumed that these respondents, because they are business students, are familiar with the power of the required competencies and also have a good understanding of their strength. As a result, for this sample, competencies better explain their intentions. In the national level survey, the samples are nationally representative and heterogeneous. This introduces potential bias in the subjective responses in the national level study. Ajzen et al. (2011) argue that the level of information and knowledge about prospective behaviour ensures accuracy of behavioural prediction. Since business students might have a good understanding of the business environment and the business start-up process, their behavioural intention is depicted more accurately by their competencies.

In a national context, people come from diverse backgrounds and have different levels of cognitive condition, knowledge and information. There is potential for bias in the national level responses since respondents have different knowledge about the business start-up process. We argue that this bias might help to explain intention, but not behaviour. For a general understanding and to support the predictability of the theory, we prefer the national level study since it represents all groups of people in a society. However, in a knowledge society, if people

have similar understanding of the business environment and the start-up process, their intention may be better explained by their competencies. Our findings from the pilot study are based on a 'knowledge society' and are not generalisable, while the findings from the national level study that includes heterogeneous respondents are generalisable. So, considering this generalisability and the predictability of the theory, the national level study provides support for our proposed extension of TPB in the form of CVTE to predict entrepreneurial intention and behaviour. This helps us to achieve the overall objective of the study, which was the improvement of entrepreneurship behaviour theory. However, the theory needs to be tested in different national settings to confirm the accuracy of weighted competency compared to PBC.

Attitude was highly significant, in both the pilot study and the national level study, for predicting entrepreneurial intention. On the other hand, attitude was not significant in models 7 and 8 for predicting behaviour. Model 7 used self-efficacy or self-level of competency whilst model 8 used weighted competency to analyse behavioural bias. Both these models absorbed the response bias of attitude through behavioural control variables. As a result, attitude became insignificant in both models. The AICc and BIC calculation in Table 3.21 showed that model 8 is the best model to explain behaviour or activity. The insignificant relationship between attitude and behaviour is a further reminder to include intention as a mediating factor between attitude and behaviour as per the theory of reasoned action (Fishbein & Ajzen, 1975).

The findings for social status and entrepreneurship were inconsistent. In the national study, we found social status to be highly positively significant for explaining entrepreneurial intention, and moderately negatively significant for activity or behaviour. This suggests that the social status of entrepreneurs positively influences respondents to become entrepreneurs. On the other hand, those that assigned a low score to social status had a higher likelihood of starting a business. This may be due to the condition of the country surveyed. We conducted the study in a South

Asian developing country, where the probability of necessity driven entrepreneurship is higher. The results of our pilot survey showed that social status was insignificant for entrepreneurial intention. The mean responses, on a 7 point Likert scale, for social status were 4.37 and 5.45, in the pilot and national surveys respectively. Most existing studies of entrepreneurial intention use samples constituted of business students. So, the contradiction may be the result of sampling differences. However, comparison with a national level study in a developed country would tell us more about these differences.

In our study, we found that behavioural control of finance was highly positively significant for business start-up, but not for entrepreneurial intention. Henley's (2007) study using BHSP data provides similar results. Our findings show that skill, finance and business opportunity control individual behaviour significantly to start a business, whilst business network and ability to work independently have an insignificant positive influence. In the national level study, network has a highly insignificant negative relation with entrepreneurial intention. This explains that those with better networking ability were not anticipating a career as an entrepreneur. This may be because, in a collective society, in our surveyed country, the majority of respondents will exploit their business networks as job seekers to become included in the labour market. However, the result of the pilot survey showed that network has marginally significant positive influence on entrepreneurial intention. When we include parents' self-employment in the model, network became insignificant. This reveals that the majority of the network members were based on family relationships.

In the behavioural control analysis, we found that the highly significant influence of skill and opportunity applies to both intention and activity, but that the effect of financing and networking are different on behavioural control in relation to intention and activity. However, we need to test

the relationship of behavioural control variables and the entrepreneurial behaviour, controlling for the role of intention in the behaviour model, in a longitudinal analysis.

The above discussion shows contextual differences in our findings. Previous studies of entrepreneurship found that social status has positive influence on entrepreneurial intention and activity. However, we also found a positive influence of social status on intention in both the UK and Bangladesh contexts, and a negative influence on entrepreneurial activity in the latter context. In the early 1970s in the UK, entrepreneurs had no social status. At that time, entrepreneurs were regarded as greedy and tax evaders. Bangladesh is a developing country. In the developmental stage, people face complex social conditions where entrepreneurs are considered wealthy, but also bank loan defaulters. The media in Bangladesh provides both positive and negative images of entrepreneurs which may be why social status positively influences entrepreneurial intention, but negatively influences entrepreneurial activity in that country.

As already mentioned, network has a negative influence on entrepreneurial intention in Bangladesh. Previous entrepreneurship studies observe a positive influence of network. We found a positive relationship between network and entrepreneurial activity in Bangladesh. However, we found a negative influence of network on entrepreneurial career intention in that country. The main reason for this negative influence may be the experience of current entrepreneurs. In Bangladesh, entrepreneurs face huge administrative and bureaucratic problems in setting up and running a business. These negative experiences may influence the members of their network of potential entrepreneurs. On the World Bank's Doing Business (2014) index, Bangladesh ranked 83 in 2013. It is ranked 100 for paying tax, 185 for enforcing contracts, 189 for electricity supply, 177 for property registration, and 86 for obtaining credit. This is highly indicative of the negative experience of current entrepreneurship in Bangladesh.

The entrepreneurial experience of parents also has a negative influence on entrepreneurial intention and activity, and this may be for similar reasons. So, existing entrepreneurs in Bangladesh may be exerting a negative influence on their network members in relation to becoming entrepreneurs.

### 3.10 LIMITATIONS

This study used a single item construct to study attitude. Though there is evidence that a single item construct gives the same result as a multiple item construct, the latter might perhaps be more acceptable. Kruger et al. (2000) use a single item construct to compare the TPB and the EE model. However, they mention that a multiple item construct would increase confidence in the results. In our study, we used cross-sectional data which do not allow us to test the relationship between intention and behaviour. Attitude, intention and behaviour are developed through a dynamic process. Testing the relationship between behaviour and its antecedents requires the subjects to be observed over different periods of time. The current study provides only a snapshot to explore static relationship between a behaviour and its antecedents. Also, since intention and behaviour do not occur simultaneously, cross-sectional data do not allow us to test the relationship between entrepreneurial intention and behaviour. However, cross-sectional studies are common in research on entrepreneurial behaviour and do not affect the validity or robustness of the models (Ajzen, 1987; Kruger et. al., 2000).

### 3.11 FUTURE RESEARCH

This study tested three demographic factors. Future work could also include education and access to media. Since our study was a cross sectional study, we tested the relationship between attitude and intention for intention analysis and, for behaviour analysis, we tested the relationship between attitude and behaviour. We could not test the relation between intention

and behaviour. Future research could employ a longitudinal study to test the relationship among attitude, intention and behaviour. We ran our national level study in a South Asian developing country. To achieve generalisation of predictability, the CVTE theory needs to be tested in other developed and developing country contexts.

### 3.12 CONCLUSION

To overcome the limitations of existing intention based theories in predicting entrepreneurial intention and behaviour (TPB and EE), we proposed CVTE as an extension to the existing theory. We also include demographic variables. Instead of using the PBC variable in TPB, or perceived feasibility in the EE model, or self-efficacy in social agency theory, we used weighted competencies as the behavioural control variables. We developed three hypotheses to study our proposed extension to existing theories. We investigated our hypotheses in a nationally representative random sample in Bangladesh (2,000 respondents), after running a pilot survey administered to 110 undergraduate students in a business school in the UK. We considered five competencies: knowledge and skill, funding, opportunity, networking and independence. We added age, gender and parent's self-employment as demographic variables, and attitude and social status as cognitive variables. We asked separate questions about the importance (weight) of each competency for becoming an entrepreneur. We calculated weighted competency using the ratio method. To analyse the joint effect of the variables to test our hypotheses we used the wald test. In our analysis, we used AICc and BIC to compare the models.

The results show that demographic variables have significant direct influence in entrepreneurial intention and entrepreneurial activity. In addition, we found that both competencies and

weighted competencies have significant influence on entrepreneurial behaviour. Among the competencies, skill and opportunity have a highly significant influence on both entrepreneurial intention and behaviour. Finance is significant for entrepreneurial behaviour, but not for entrepreneurial intention. Network is significant for intention, but not for behaviour. Gender is highly significant for both career intention and entrepreneurial activity. Attitude was highly significant for entrepreneurial intention in all the models. In the behaviour analysis attitude was insignificant when competencies or weighted competencies entered the model. Due to data limitations, we were unable to test the relationship between entrepreneurial intention and entrepreneurial activity. The findings of the study provide new insights into entrepreneurial behaviour analysis using weighted competency.

The results of this study show that weighted competencies have a significant influence on entrepreneurial activity and intention. We also found a significant direct influence of demographic variables on entrepreneurial intention and entrepreneurial activity. This indicates that the inclusion of demographic variables and weighted competencies improves behaviour theory. The work in chapter 3 achieved our objective of improving entrepreneurship behaviour theory. To improve the theory further, we want to test the relationship between counterfactual thinking and entrepreneurial intention. In chapter 4, we test the relationship between counterfactual thinking and entrepreneurial intention.

# Chapter Four

## Counterfactual Thinking and Entrepreneurship

### 4.1 INTRODUCTION

Previous studies have found that there is a significant difference between entrepreneurs and non-entrepreneurs based on counterfactual or regretful thinking (Baron, 2000, 2004; Markman et al., 2005). Counterfactual thinking is mental simulation of 'what might have been', but which is contrary to the fact. Counterfactual thinking is activated by a negative emotional experience and takes the form of an if-then conditional proposition. For example, after missing a special offer for a product one might engage in counterfactual thinking, such as, if I bought the product on special offer then I could resell it to earn a good profit. Counterfactual thinking may be content neutral regretful thinking of regular life events, or content specific regretful thinking of present or past missed opportunities. Content specific counterfactual thinking is generated using the information directly related to the problem at hand. Content neutral counterfactual thinking is generated on the basis of the mind-set without any direct relationship between information and the problem at hand.

Studies in cognitive psychology argue that content specific counterfactual thinking affects the behavioural intention, to influence the behaviour directly, and content neutral counterfactual thinking influences entrepreneurial intention indirectly (Smallman & Roese, 2009). In the content specific process, an individual involved in counterfactual thinking develops a connection between counterfactual thinking and intended behaviour in the same future situation. In the content neutral process, the individual involved in counterfactual thinking develops a general attitude to and motivation for improving future performance of similar actions. In the earlier

example, if the individual missed the opportunity to buy a TV at a special sale price and engaged in counter factual thinking, the content specific counterfactual thinking of buying a TV at a sale price will make him or her intend to seek out a special offer before buying a TV. On the other hand, content neutral counterfactual thinking will motivate him to search for such opportunities in other areas and will indirectly influence his or her other actions related to such opportunities.

Content specific counterfactual thinking helps to regulate behavioural intention and behaviour. However, to regulate behavioural intention, the information needs to be specific and functional. According to the theory of planned behaviour (TPB), intention is the immediate pre-stage to behaviour (Ajzen, 1991, 2011). Intention mediates between attitude and behaviour to influence the behaviour. TPB explains that behaviour is the result of behavioural intention and perceived behavioural control, which is the condition that controls the behavioural intention of behaviour. Understanding the influence of counterfactual thinking on the entrepreneurial intentions of potential entrepreneurs is essential to the entrepreneurship development process. It is crucial for gauging the cognitive state of potential entrepreneurs. However, at the time of writing, there are no analyses of the influence of present or past content specific or content neutral counterfactual thinking on entrepreneurial intention. This study would like to fill this gap in the literature and understand how content specific or content neutral counterfactual thinking may influence entrepreneurial career intention.

The commonly agreed definition of counterfactual thinking is ‘mental reorientations that are explicitly contrary to facts or beliefs’ (Roese & Morrison, 2009). Belief is core to attitude, and attitude is the antecedent to intention. In this context, studies in psychology argue that there is a

causal relationship between content specific counterfactual thinking and behavioural intention (Epstude & Roese, 2008; Smallman & Roese, 2009). Similarly, there may be a relationship between content specific counterfactual thinking and entrepreneurial intention. In addition, since counterfactual thinking is related to the imagination and memory (Brigard & Giovanello, 2012), this type of thinking might also moderate the influence of entrepreneurial attitude and opportunity identification to influence the entrepreneurial intention to take a content neutral path. In a content specific path, the individual analyses the negative outcome of past or present specific events and focuses on improving future performance and behavioural intentions. In a content neutral pathway, the individual uses the present negative outcomes in a general way, applying them to other future events which are distinct from the original event.

In daily life, young adults, like all other age groups, face different counterfactual situations. Information analysis of these imagined events may affect their future courses of action in both content specific and content neutral directions of counterfactual thinking. The process of deciding on a career, like all other life choices, has to be experienced by young adults. Since counterfactual thinking has direct and indirect impacts on future courses of action, it may influence the decision of an adult to become an entrepreneur. In this context, the present study tries to establish a relation between counterfactual thinking and the intention to make entrepreneurship a career. Counterfactual thinking shows how an event might have been different. It takes account of both the antecedents to and the consequences of an event. This can be regret over a missed opportunity or satisfaction at avoiding an unexpected consequence.

Previous work on entrepreneurship and counterfactual thinking focuses on two main issues. First, the differences between entrepreneurs and non-entrepreneurs based on counterfactual

thinking (Baron, 2000; Markman et al., 2005), and second, the influence of counterfactual thinking on self-efficacy (Arora et al., 2013). Baron (2000) found that entrepreneurs engage less frequently in counterfactual thinking and have fewer regrets in relation to their life choices, than non-entrepreneurs. Markman et al. (2005) found that entrepreneurs experience stronger and different regrets to non-entrepreneurs. They find that the number of regrets is almost the same for entrepreneurs and non-entrepreneurs. However, these studies do not investigate the impact of upward counterfactual thinking on entrepreneurial intention.

This study addresses the relationship between counterfactual thinking and entrepreneurial career intention. To analyse this relationship, we use the functional theory of counterfactual thinking (Epstude & Roese, 2008). The study contributes to the theory and to policy, in several ways, in relation to the development of entrepreneurship. First, it establishes a relationship between counterfactual thinking and entrepreneurial career intention, an area that has so far been overlooked. Second, it identifies attitude as the most powerful factor in entrepreneurial intention and behaviour. We study the interaction effect between attitude and counterfactual thinking which should provide a better understanding of how attitude is moderated by counterfactual thinking to influence entrepreneurial career intention. Third, the interaction between counterfactual thinking and opportunity identification should help us to understand the influence of counterfactual thinking on opportunity identification and also how the impact of opportunity identification is moderated by counterfactual thinking in deciding on entrepreneurship as a career. Third, this work should advance theory and policy developments related to the entrepreneurship process. It should throw light on the working of the counterfactual mind/intent to be an entrepreneur.

The chapter is structured as follows. Section 4.2 presents the theoretical background and develops the hypotheses. Section 4.3 is the method section which discusses the measures and model variables. Section 4.5 discusses the results and some implications for entrepreneurship development, future research directions. Some limitations of this study are given in Section 4.6. The chapter concludes in Section 4.7.

## 4.2 THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

Interest in counterfactual thinking (Roese, 1994) is relatively recent. The presence in people's minds of 'what might have been' creates counterfactual thinking, which may affect their intentions and behaviours (Sana et al., 2001; Epstude & Roese, 2008). There are two types of counterfactual thinking: upward counterfactual thinking and downward counterfactual thinking. If the evaluative condition of the past in thinking is better than the reality, this is described as upward counterfactual thinking, if it is worse than the reality, this is termed downward counterfactual thinking (Roese, 1994; Markman et al., 1993). For example, Mr 'X' breaks his leg in a road accident. He might engage in counterfactual thinking by evaluating the condition that he might have lost his life in the accident. This is an example of downward counterfactual thinking. Upward counterfactual thinking can engender disappointment and regret (Davis et al., 1995). If Mr 'X' had missed an unexpected opportunity to make an investment with a guaranteed 100% return, he might engage in upward counterfactual thinking. In this study, we focus on the unpleasant or regret aspect of counterfactual thinking which comes from missed opportunities in upward counterfactual thinking. In what follows, we refer interchangeably to upward counterfactual thinking or regret.

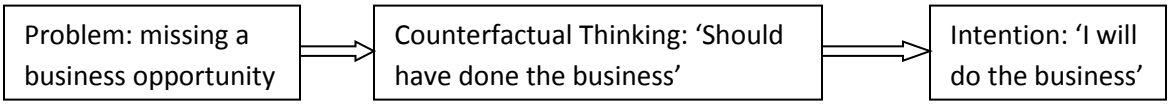
Counterfactual thinking can change human behaviour in many ways. It can provide motivation to strengthen future behavioural intention, and to regulate future behaviour. There are two pathways in upward counterfactual thinking. These are content specific counterfactual thinking and content neutral counterfactual thinking. The content specific pathway of counterfactual thinking evokes semantically related behavioural intention. This results from the counterfactual thinking and imagined desired outcome (Spellman et al., 2005; Spellman & Mandel, 1999). This pathway follows the regulatory loop mechanism of ongoing social behaviour in three steps: 1) negative results activate counterfactual thinking; 2) counterfactual thinking activates a related behavioural intention'; and 3) behavioural intention directs the corresponding behaviour. In contrast, content neutral counterfactual thinking improves performance in domains that are distinct from the original counterfactual event (Kray & Galinsky, 2003; Markman & McMullen, 2003). For example, counterfactual thinking might focus on study behaviour and exert influences on career intention. In a content neutral pathway, counterfactual thinking forces the individual to consider different alternatives for a particular situation. Thinking about the alternatives motivates the individual to consider alternatives in subsequent unrelated situations (Kray et al., 2006). In this way, the attitudes and behavioural regulations of an individual are influenced to guide future behavioural intent and the subsequent behaviour.

Functional theory of counterfactual thinking states that the primary function of counterfactual thinking is to manage and coordinate ongoing behaviour (Epstude & Roese, 2008). According to the theory the primary function of counterfactual thinking is problem solving. It 'should be activated by problems, and it should have the effect of evoking behaviours that correct those problems' (Epstude & Roese, 2008, pp. 170). The theory states that content specific upward counterfactual thinking develops intention for future behaviour to correct past or present problems. Counterfactual thinking helps people to interpret their present and reinterpret their

past. Through the perception and interpretation process, upward counterfactual thinking leads to improved performance (Markman & McMullen, 2003; Nasco & Marsh, 1999). Counterfactual thinking is common feature of the conscious mental condition of people and is common across nations (Gilovich et al., 2003). Previous studies in social psychology (e.g. Rose & Summerville, 2005) try to establish a relationship between number of regrets during the life course and the behaviour in education, romance, parenting, leisure, finance, health, etc. However, research shows (Smallman & Rose, 2009) that only content specific upward counterfactual thinking has significant effects on future intention and behaviour; content neutral upward counterfactual thinking has no significant impact on specific intention and behaviour.

Content specific counterfactual thinking can be described as 'contextual', and content neutral counterfactual thinking can be described as 'independent of context' which is 'alternatives evoked to unrelated to behavioural' intention (Smallman & Rose, 2009). An example of contextual upward counterfactual thinking is being prepared for future business opportunities based on experience of past missed business opportunities. In their functional theory, Epstude and Roese (2008) explain that upward counterfactual condition is 'inference that links an antecedent to a consequent'. Here, an antecedent is an action and a consequent is a goal. These can be translated to the condition where people that hugely regret missing opportunities will learn more for future through mental simulation. This, in turn, will influence their future entrepreneurial intention. In the above example of business opportunity, missing an opportunity is a problem. Functional theory of counterfactual thinking says that upward counterfactual thinking will be generated to solve this problem. This counterfactual thinking develops intention for future action to solve the problem. This is depicted in Figure 4.1.

Figure4.1: Content specific pathway of functional counterfactual thinking




(Source: Adapted from Roese & Olson (1997) and Segura & Morris (2005).

This explains that if an individual misses an opportunity, and if this missing opportunity develops counterfactual thinking, the individual will have a high level of intention to exploit future business opportunities. Based on the above argument, we hypothesise that

***Hypothesis 1: Upward counterfactual thinking or regret positively influences entrepreneurial intention.***

4.2.1 Attitude and Counterfactual Thinking

Attitude is an important construct of TPB. According to TPB, behaviour is a function of intention and perceived behavioural control (PBC) while intention is a function of attitude, subjective norms, and PBC (Ajzen, 1991). Previous studies of entrepreneurial intention and behaviour find that the construct of attitude is a strong predictor of entrepreneurial intention (Kautonen et al., 2013; Ferreira et al., 2012; Linan & Chen, 2009). These studies consider attitude in constant form. However, social psychologists argue that attitude may be moderated or changed through a continuous cognitive function if there is any dissonance between core belief and experience and/or counter-imagination. Dissonance in core belief can be generated by counterfactual thinking and different learning programmes. Studies of entrepreneurship suggest that enterprise

learning programmes change participants' attitudes to entrepreneurship quite significantly (Athayde, 2009). However, these studies do not address how attitude is moderated or changed. Like enterprise learning programmes, counterfactual thinking can also change an individual's attitude significantly leading to a decision to make entrepreneurship a career. In this situation, content specific upward counterfactual thinking will generate dissonance in the belief for missing opportunities. However, dissonance in belief will not always modify the attitude of an individual.

An individual's attitude is developed through a cognitive process, from different perceptions, in an organised systematic process of receiving. Bohner & Dickel (2011) define attitude simply as 'an evaluation of an object of thought'. One of the ways to develop developing this thought is counterfactual thinking. Studies in social psychology (Roese, 2004; Sana et al., 2002) find that counterfactual thinking can increase perception bias and resulting overconfidence. Thus, counterfactual thinking moderates the attitude of the individual via hindsight bias. Hindsight bias is a mental state to perceive a fact. Research findings support that the decision to become an entrepreneur is influenced by different types of cognitive bias (Baron, 2004). However, if multiple counterfactual thinking is generated by failure or experience of missed opportunities, only the most realistic one will guide the behavioural intention (Evans & Over, 2004). For example, if an individual that missed a good opportunity because it was not feasible, this will not guide his attitude and behavioural intention. If there is no scope for behavioural modification, upward counterfactual thinking will be suppressed through 'dissonance reduction' (Rose & Summerville, 2005; Gilbert & Ebert, 2002). On the other hand, upward counterfactual thinking will moderate attitude and guide subsequent behavioural intention if the missed good opportunity was feasible and affordable in the context of the individual's life goal.

Cognitive dissonance theory states that people tend to make every effort to keep their knowledge, actions and attitude consistent. An inconsistent attitude results in a psychologically uncomfortable state that motivates people to reduce the dissonance by changing their attitude to be more consistent (Veen et al., 2009). Cognitive dissonance theory helps to explain the moderations and changes of attitude in a wide range of human behaviours. The efficiency of human cognitive function is accelerated by knowledge from experience. This is called episodic knowledge. Like episodic knowledge, counterfactual imagination of missed opportunities increases the efficiency of cognitive function 'by maintaining a store of exemplars against which to compare present situations and select the most beneficial course of action' (Brigard & Giovanello, 2009). As a result, upward counterfactual imagination or thought will moderate our attitude and will influence the effect of attitude on behavioural intention. Based on this discussion, we hypothesise that:

***Hypothesis 2: The influence of attitude on entrepreneurial intention will be moderated by upward counterfactual thinking or regret, such that attitude will have a more positive influence on entrepreneurial intention if regret is high rather than low.***

4.2.2 Opportunity and Counterfactual Thinking:

There are two views of opportunity in entrepreneurship: the discovery view and the development view. To explain the relationship between opportunity and counterfactual thinking, we need to clarify our ontological position in relation to the concept of opportunity. The definition of opportunity is a central debate in entrepreneurship research. Some 68 articles on the subject of opportunity were published in leading entrepreneurship and management journals between 1990 and 2009, 60% of which are conceptual (Short et al., 2010). The established view of

opportunity is that it exists independently through market dynamics and is ready to be discovered (Grégoire et al., 2010). This is called the discovery view. In recent years, a contrary view, the development view, has been developed, which states that opportunities arise out of the subjective interpretations and creative actions of individuals (Barreto, 2012). The main difference between these two ontological positions is whether the opportunities are developed independently through market dynamics or created and developed by individuals. The former stresses the origin of the opportunities (failure of the market process) and the latter emphasises the opportunities themselves. In the discovery view, Kirzner (1997, 2009) maintains that the interaction between the knowledge of an individual and his environment 'alert' him to the existence of opportunity. The development view argues that individuals perceive opportunity at a rudimentary stage and need to be creative to develop it (Davidsson, 2003; Alvarez & Barney, 2007). Adherents to this view argue that a perceived business idea from market dynamics will not be an opportunity without further development

Market conditions and availability of information are key to the difference in opportunity concepts. Based on market dynamics and availability of information, market conditions are grouped as uncertain or risky. If the information to assign probability is not available, it is called an uncertain condition. If the decision maker has sufficient information to assign probability this is called a risky condition. An uncertain market condition is related to innovative and creative opportunities while a risky market condition is related to continuous, imitative and incremental opportunities (Gaglio, 2004). In a qualitative study of the Swedish mobile internet industry, Sanz-Velasco (2006) finds that 'opportunity discovery' aligns with cognitive process in a low risk situation, for example, retailing, where entrepreneurs tend to focus on the offer rather than the customer. In contrast, 'opportunity development' is aligned to uncertain market conditions, for example, new product development in manufacturing. This suggests that opportunity exists in

either more perceivable or less perceivable forms. If an opportunity exists in less perceivable form, some further development is needed to explore it. Without going into the detail of the debate, since this is beyond the scope of the present study, we would support the stance taken by Grégoire, Shepherd and Lambert (2010) that 'opportunity exists for willing and able' – as separate from evaluation of whether someone should attempt to exploit the opportunity. Knowledge, ability and experience help the individual to perceive an uncertain market condition and work within it, to recognise opportunities for further development.

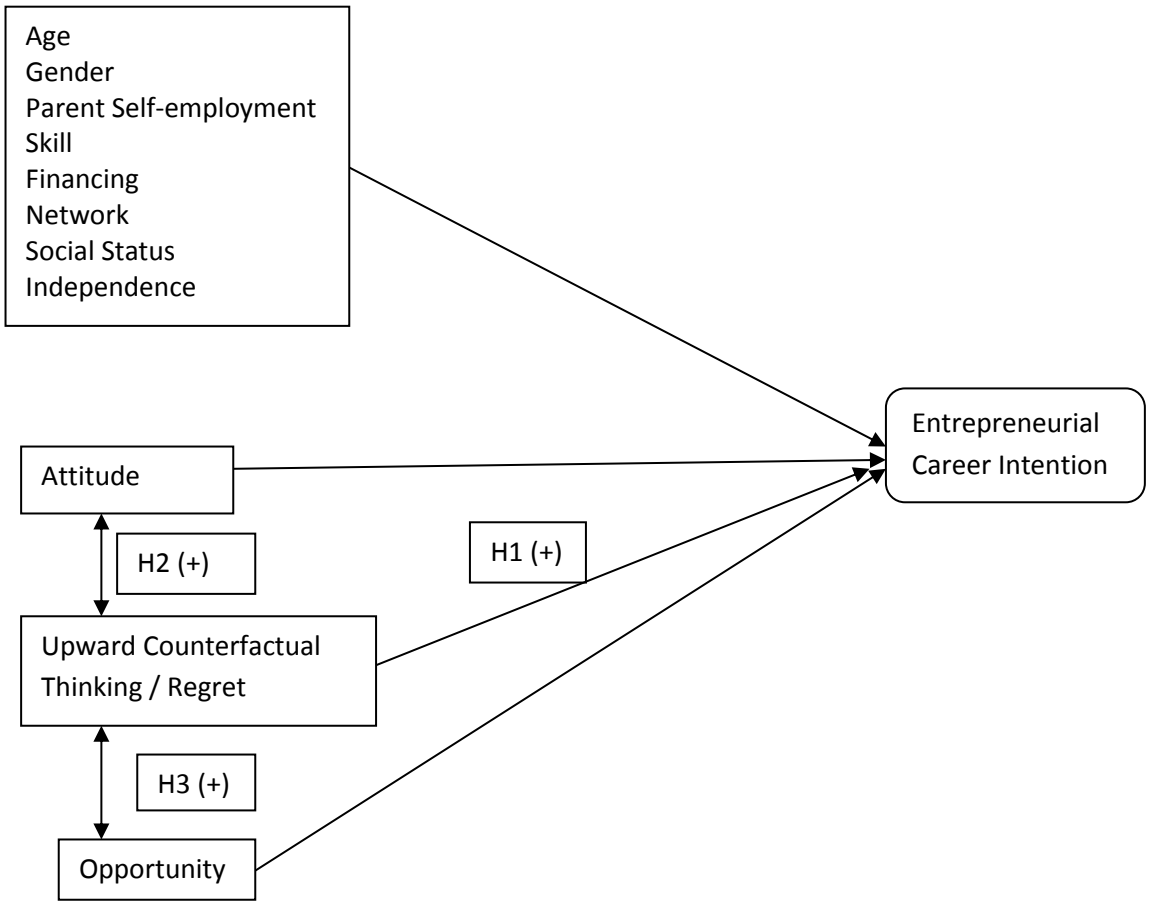
Previous work identifies the role of opportunity identification in entrepreneurship. Not everyone is able to identify opportunity. Some people recognise them before others. Some may be driven by opportunities before anybody else. The opportunity identification process is not unique, and is rather diverse (Gaglio, 2004). Experiential learning (Corbett, 2005), experience (Bingham et al., 2007; Baron & Ensley, 2006), different entrepreneurial cognitions (Busenitz, 1999), prior distribution of knowledge (Shane, 2001), and past failures (Mitchell et al., 2008) help some people to identify opportunities more quickly. Though the antecedents to opportunity identification are diverse, there are two common issues: experience and learning. People who use their experience for future learning can identify opportunity more quickly. Business ideas and dreams turn into opportunities through an evaluation process (Short et al., 2010). Potential entrepreneurs can explore and evaluate their business ideas and dreams heuristically based on previous experience and/or the learning process. Like experience, upward counterfactual thinking may also help to explore business ideas and evaluate them heuristically. Upward counterfactual thinking relates to missed opportunity which engenders regret. Regretful thinking is referred to as upward counterfactual thinking (Rose, 2004; Rose & Morison, 2009). Through the counterfactual thinking process, individuals can deconstruct situations to make sense of the present as training for future activities (Arora et. al., 2013). This helps existing and potential

entrepreneurs to evaluate the situation through a heuristic information processing system to locate opportunities. Based on the above, we formulate the following hypothesis:

***Hypothesis 3: The influence of opportunity identification on entrepreneurial intention will be moderated by upward counterfactual thinking or regret, such that opportunity identification will have a more positive influence on entrepreneurial intention if regret is high rather than low.***

The hypotheses are illustrated in Figure 4.2:

Figure 4.2: Hypotheses on Counterfactual Thinking and Entrepreneurial Career Intention



## 4.3 METHOD

### 4.3.1 Research Design and Procedure:

There is a growing debate in social science research – especially in psychology, management, and in marketing - over the use of a single item construct or multiple item measurement constructs. Venkatraman and Grant (1986) found that a single item construct is widely used in strategic management research. They argue that researchers should pay attention to developing their measurement techniques. In a recent study, Christophersen and Konradt (2011) found high predictive validity, convergent validity, and adequate reliability of a single item measure compared to multiple item measures, for the intention to buy, in online store research. They measure trust, aesthetics, usability of the online store and intention to buy, using both single and multiple items. In a similar study, Robins et al. (2001) found that single item construct in a study of self-esteem gave similar reliability and validity to a multiple item construct, in adult samples. Bergkvis and Rossiter (2007) suggest that there is no difference in the predictive validity of multiple item and single item constructs. They measure the attitude to advertising and attitude to branding, using a single item and multiple items. In predicting attitude to brand using attitude towards advertisements they did not find any difference in predictability. In a study of services, Drolet and Morrison (2001, p. 196) found that a multiple item construct contributes very little information to the first item. They argue that "*added items actually aggravate respondent behavior, inflating across-item error term correlation and undermining respondent reliability".* However, methodologists such as Wanous and Reichers (1996) and Wanous et al. (1997) argue in favour of a multiple item construct to measure job satisfaction instead of a single item measure. Their studies were challenged by Loo (2002) who finds a single item sufficient to measure a simple and easy to understand 'construct'. If a construct has multiple dimensions, and multi-facets a complex single item construct may not be sufficient. In our study, since attitude towards self-employment, business opportunity identification, business skill, social

status, independence, financing, and regret are simple and easy to understand we use a single item construct. We use a 7-point Likert scale to measure Attitude, Opportunity, Network, Financing, Skill, Social Status, Independence and Regret. The responses for the variable Entrepreneurial career intention, Gender, and Parent self-employment are dichotomous. Age is the exact age. Details of the construct are provided in the appendix.

### 4.3.2 Measures:

#### 4.3.2.1 Dependent Variable:

Entrepreneurial career intention is the dependent variable. Studies use either Likert scales (Walter et al., 2013; Linan and Chaen, 2009; Kolvereid, 1996) or dichotomous responses for the entrepreneurial career intention or future start-up intention, within a time limit (from 2 to 5 years). This time limitation is required to follow up intention guided behaviour. Since our objective is to find the cognitive condition of choosing entrepreneurship as career, we do not limit the intention by time. Friedkin (2010) mentions that the crux of behavioural intention is the manifestation of priority of the individual's personal goals. Bringing together the concepts of multiple items of entrepreneurial intention in the construct in Walter et al. (2013), Kuckertz and Wagner (2010), and Kolvereid (1996) we develop a single item construct for entrepreneurial career intention. We asked respondents if they intended to work for themselves or for others in their career. The options were: yes, no, undecided, and no response. 103 respondents responded either yes or no.

4.3.2.2 Independent Variables:

Attitude

There are two types of measures of attitude: implicit attitude and explicit attitude. In all previous entrepreneurship studies, explicit attitude is used to measure attitude. In explicit measurement, the researcher asks the respondents directly, to evaluate an object on a self-reporting numeric scale of single or multiple items (e.g. survey questionnaire) (Himmelfarb, 1993; Bohner & Dickel, 2011). The rationale for using an explicit measure is that respondents are able and willing to report their attitudes accurately. Here, we assume that people are not motivationally biased in their attitude reporting. An implicit measure assumes that people may hide their attitude in order to present a positive image in self reporting. For this reason, evaluative associations in a perceiver's mind to evaluative stimuli were used to measure differences in response time to determine implicit attitude. There are two methods used to measure implicit attitude. These are implicit association test (see Greenwald et al., 2009 for details) and evaluative priming task (see De Houwer et al., 2009 for details). Since our 'object' is easy to understand and there is nothing to feel shy about agreeing or disagreeing, we assume that respondents are able and willing to report their attitude accurately. For this reason, we used the explicit measure in our study.

To develop a single item construct for attitude, we consulted Kolvereid and Isaksen (2006), Gundry and Welch (2001), Iakovleve et al. (2011), and Linan and Chen (2009). Taking the concept of different items of the attitude construct from the above studies, we developed a single item construct for attitude. In the single item construct respondents are asked to give their opinions on the statement that 'self-employment is better than working for others'. The mean response and standard deviation (SD) show that there is no significant difference between earlier studies and our findings on attitude.

## Opportunity

Based on our ontological position we measure opportunity considering market alertness. The term ‘market alertness’ is translated as a business idea. Walter et al. (2013) measure opportunity perception by asking the dichotomous question of whether the respondent can perceive an opportunity or not. However, other studies define opportunity as an item in the PBC construct (Linan & Chan 2009; Short et al., 2010). In a practical business sense, the term ‘opportunity’ conveys a sustainable business idea which is exploitable from a market perspective. The terms ‘sustainable’ and ‘exploitable’ may mean different things to different respondents. To avoid confusion, we developed a single item construct to measure opportunity by asking respondents to rate the statement that ‘I have a very good profitable business idea’ on a 7-point scale.

## Regret

Regret intensity is commonly used in psychology to measure regret. In entrepreneurship research, Arora et al. (2013) use unpleasantness to measure the regret. They measured regret related to the entrepreneurial role to analyse entrepreneurial behaviour. For undergraduate student respondents, their existing life domain and future life domain are in two different contexts. Their existing life domain is as a student; their future life domain will be in a professional context. Considering these life domain differences, to make the analysis contextual we asked them about a regret context related to their present life style following Teigen et al. (2011). We asked them firstly about their readiness to exploit a profit making opportunity and secondly about the regret intensity if they missed the opportunity. This is because if they are not intending to make profit, asking them about the counterfactual will not be contextual to a

potential entrepreneurial career. Taking account of this, we asked them first if they would like to get the latest mobile phone set on special sale offer, which they then could resell at a profit. The follow-up question was if they missed an opportunity of the special offer to buy the set for only £75 (pay as you go) and the resale value of £200– how much on a 7-point scale would they regret this.

4.3.2.3 Control Variables:

Previous studies find that parents' self-employment (Blanchflower & Oswald, 2007; Laspita et al. 2012; Schmitt-Rodermund, 2004), gender, skill (Liñán, 2008), network (Hmieleski & Corbett, 2006; Slotte-kock & Coviello, 2009), social status, finance (Marlow & Patton, 2005), and independence are important determinants of an entrepreneurial career intention. So, we control for these variables. Opportunity identification, skill, network, finance and independence are used as items of the PBC construct in some studies and as a separate construct in others. We developed these as separate single item constructs taking the concepts from previous studies. Age is an influential determinant of entrepreneurial intention and behaviour. However, Kuckertz and Wagner (2010) and Zellweger et al. (2011) do not find any significant impact of age on entrepreneurial career intention. This may be because of the student sample. The mean age of Zellweger et al.'s (2011) sample is 23.475 with a SD of 3.595. Our mean age and SD are nearly the same and we also found no influence of age. Our data also include some missing values for age. We checked the influence of excluding age from the model and found that it introduced some significant differences. For this reason, we excluded age from our control variables following the technique of handling missing values.

4.3.3 Data:

Data were collected from 2nd and 3rd year undergraduate students in a UK Business School. The procedure of data collection has been mentioned in the section 3.7.1 in chapter 3. We conducted a survey for the data collection for the research question in chapter 4 and a pilot study for the research question in chapter 3 together. The final sample size for chapter 4 is 104. Although the sample size is small, it compares with other similar studies. For example, Dimov (2007) studied 107 MBA students to analyse opportunity intention. Smallmann and Roese (2009) conducted their three studies of counterfactual thinking and behavioural intention on samples of 30, 46, and 50. Baron (1999) surveyed 102 respondents from different backgrounds to analyse counterfactual thinking and venture formation. Thus, our sample seems adequate to study counterfactual thinking and entrepreneurial intention. Among the respondents, 56.3% were male, 54.4% of respondents reported that at least one of their parents was self-employed; 66% of respondents were interested in entrepreneurship as a career rather than working for others. The mean age is 20.77 (SD 1.78). The mean responses were skill 4.35 (SD 1.35), finance: 2.79 (SD 1.76), network 5.13 (SD 1.57), attitude 5.11 (SD 1.47), opportunity 4.74 (SD 1.46), social status 4.38 (SD 1.75), independence 4.99 (SD 1.49), and regret 4.13 (SD 2.0). The mean response for finance shows that most students disagree with the need for sufficient funding to start a business. This response is rational for a student sample.

Primarily, the variables were ordinal with the exception of parents' self-employment, gender, and the dependent variable, which are dichotomous. We run three logit regression models to check the impact of upward counterfactual thinking (regret) on entrepreneurial career intention (hypothesis 1) using the primary variables of interest. After analysing the direct effect of regret, we measure the indirect effect of regret to test hypotheses 2 and 3 using interaction models. To

obtain our interaction models, we generate dummy variables for all the scale variables for harmonisation purposes. Unlike linear regressions, interactions in logit regressions are complex to interpret since logistic regressions report log odds. The value of a variable affects the log odds or odds ratios of all the other variables. For this reason, in a logistic regression model to analyse interaction effects, the variables should have standardised or harmonised values. One alternative to standardising or harmonising the values is using the inteff model (Ai & Norton, 2003). The inteff model gives an overall implication of the interaction based on a standardised value (z value). Since we are interested in the moderation effect in alternative situations, we use margin analysis after running the interaction logit models. So, instead of using the inteff model to test the interaction effect, we use margin analysis to analyse the interaction effect. Although we present the marginal effect of logit regression, we depend on margin analysis for the interaction effect analysis. Marginal effect analysis has some technical limitations related to analysis of multiplicative models of nonlinear models. To avoid confusion, we use margin analysis for our interaction effect analysis. Based on the above, we created dummy control variables and independent variables with scale values. Scale variables are ordinal variables scaled from 1 to 7. We consider scale 1 to 4 as ‘0’ and scale 5 to 7 as ‘1’. Zero represents a low or weak score and 1 represents a high or strong score. Developing dummy variables for scale variables may introduce potential data loss. We therefore provide the original logit regression results using scale data, in Table-4.2b. The descriptive statistics using dummy and exact age are presented in Table 4.1.

Table-4.1: Descriptive Statistics and Correlation Matrix

| SL NO | Variables | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Entp_Career_ Intention | 0.660 | 0.476 | - | | | | | | | | | | |
| 2 | Age | 20.765 | 1.775 | -0.048 | | | | | | | | | | |
| 3 | Gender | 0.563 | 0.498 | 0.112 | 0.104 | | | | | | | | | |
| 4 | Parent_self_ Emp | 0.544 | 0.501 | 0.454*** | 0.083 | 0.136 | | | | | | | | |
| 5 | Human_ Capital | 0.538 | 0.501 | 0.289*** | 0.017 | 0.176* | 0.178* | | | | | | | |
| 6 | Financing | 0.202 | 0.403 | 0.007 | 0.082 | 0.154 | 0.173* | 0.129 | | | | | | |
| 7 | Network | 0.760 | 0.429 | 0.359*** | 0.095 | 0.232** | 0.391*** | 0.201** | 0.115 | | | | | |
| 8 | Social_ Status | 0.481 | 0.502 | 0.246** | -0.087 | -0.084 | 0.032 | 0.157 | 0.139 | 0.091 | | | | |
| 9 | Independence | 0.615 | 0.489 | 0.158 | -0.167 | -0.123 | -0.032 | 0.140 | -0.095 | -0.121 | 0.088 | | | |
| 10 | Opportunity | 0.625 | 0.486 | 0.301*** | -0.011 | 0.178* | 0.148 | 0.319*** | -0.006 | -0.017 | 0.189* | 0.123 | | |
| 11 | Attitude | 0.606 | 0.491 | 0.6723*** | 0.019 | -0.037 | 0.330*** | 0.200** | 0.063 | 0.237** | 0.304*** | 0.171* | 0.351*** | |
| 12 | Regret | 0.452 | 0.500 | -0.042 | 0.048 | -0.018 | -0.139 | 0.027 | -0.024 | -0.167 | -0.100 | 0.083 | 0.105 | -0.019 |

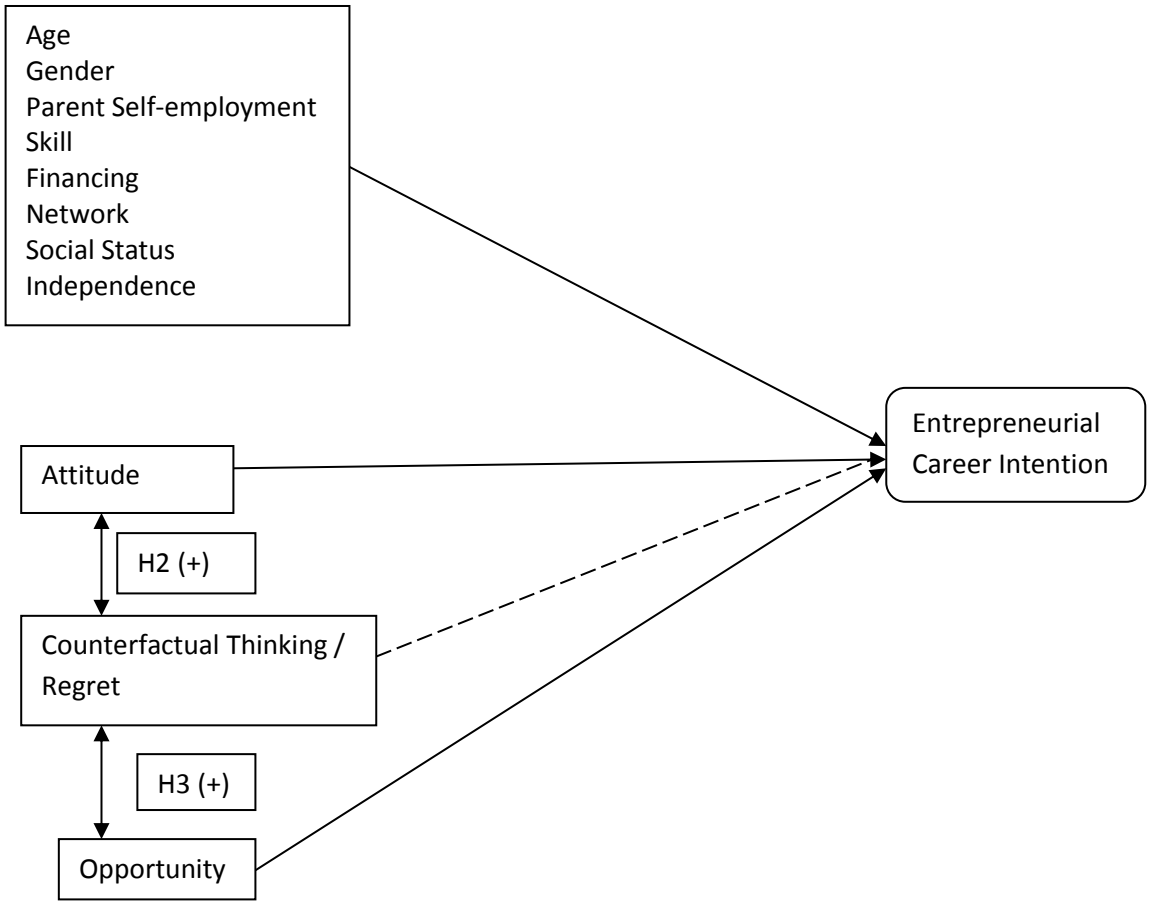
*** p<0.01, ** p<0.05, * p<0.1

The descriptive statistics show that age, gender, financing, independence and regret are not significantly correlated with entrepreneurial career intention. Most importantly, regret and age have no significant correlation with any of the variables. The correlation between independence and attitude is only marginally significant. Only 20% of respondents said that they had sufficient funds to start a business. This is as expected since the sample is constituted of students. Financing is only correlated with parents' self-employment. This shows that the offspring of self-employed parents can see the financing scope for starting a business. The correlation matrix shows that there are no multi-collinearly problems. Recent studies show that age has no significant impact on the entrepreneurial career intentions of students if the standard deviation is low (Kuckertz & Wagner, 2010; Zellweger et al., 2011). In Zellweger et al.'s (2011) study, the mean age of their sample was 23.475 with SD of 3.595. Our mean age and SD are very similar and we also found no influence of age. Our data have some missing values for age. We checked the influence of excluding age in the model and found that it introduced significant differences. For this reason, we exclude age from our control variables to cope with the missing data problem.

## 4.4 RESULTS

The results (in Figure 4.3) show that there is no significant direct influence of regret on entrepreneurial career intention. Equation 3 in Tables-4.2, 4.2a, and 4.2b is related to the direct effect of regret on entrepreneurial intention. Based on this finding we can say that hypothesis 1 is not supported by our findings. However, hypotheses 2 and 3 are supported by our results.

Figure 4.3: Influence of counterfactual thinking (Regret) on Entrepreneurial Career Intention




Equation 4 shows that the interactions of regret and opportunity have a significant impact on entrepreneurial career intention. This interaction shows that regret has a significant impact on entrepreneurial career intention. In equation 4, we can see that human capital, social status and opportunity are significant in the model for regret. Equation 5 shows that the interaction between attitude and regret is highly significant. We introduced both interactions in equation 6 to see their joint effects.

Table-4.2: Logit Regression of Entrepreneurial Career Intention

| VARIABLES | (1) Entp_Career_Intention | (2) Entp_Career_Intention | (3) Entp_Career_Intention | (4) Entp_Career_Intention | (5) Entp_Career_Intention | (6) Entp_Career_Intention |
|---|---|---|---|---|---|---|
| Gender | 0.378 | 1.258 | 1.258 | 1.547* | 1.815** | 2.221* |
| | (0.581) | (0.827) | (0.826) | (0.940) | (0.920) | (1.138) |
| Parent_self_emp | 2.277*** | 2.468*** | 2.467*** | 3.063*** | 3.303*** | 3.719*** |
| | (0.634) | (0.861) | (0.862) | (1.034) | (1.060) | (1.140) |
| Skill | 0.783 | 1.179 | 1.184 | 1.761** | 1.872** | 2.453** |
| | (0.543) | (0.739) | (0.758) | (0.879) | (0.880) | (1.050) |
| Financing | -1.207 | -1.987** | -1.994** | -1.438 | -2.582** | -2.272* |
| | (0.800) | (0.981) | (1.003) | (1.111) | (1.113) | (1.218) |
| Network | 0.969 | 1.110 | 1.104 | 0.768 | 0.428 | 0.251 |
| | (0.676) | (0.915) | (0.932) | (1.009) | (1.124) | (1.170) |
| Social_Status | 1.439** | 1.091 | 1.088 | 1.621* | 1.242 | 1.659* |
| | (0.575) | (0.758) | (0.763) | (0.894) | (0.850) | (0.931) |
| Independence | 0.957 | 0.933 | 0.931 | 1.051 | 1.492* | 1.632* |
| | (0.585) | (0.785) | (0.786) | (0.845) | (0.889) | (0.957) |
| Opportunity | | 0.0873 | 0.0854 | -2.164 | -0.385 | -2.151* |
| | | (0.771) | (0.773) | (1.325) | (0.851) | (1.298) |
| Attitude | | 3.680*** | 3.683*** | 3.990*** | 2.344** | 2.755** |
| | | (0.900) | (0.908) | (1.038) | (0.982) | (1.136) |
| Regret | | | -0.0241 | -2.239* | -1.996* | -4.271** |
| | | | (0.727) | (1.223) | (1.152) | (1.788) |
| RegretXOpportunity | | | | .301** | | .347** |
| | | | | (1.831) | | (2.036) |
| RegretXAttitude | | | | | 4.930** | 5.136** |
| | | | | | (2.105) | (2.430) |
| Constant | -2.751*** | -4.997*** | -4.980*** | -4.787*** | -4.956*** | -5.000*** |
| | (0.877) | (1.521) | (1.600) | (1.699) | (1.732) | (1.817) |
| Pseudo R2 | 0.322 | 0.559 | 0.559 | 0.610 | 0.618 | 0.660 |
| LR chi2 | 42.27*** | 73.30*** | 73.30*** | 80.05*** | 81.02*** | 86.56*** |
| Observations | 102 | 102 | 102 | 102 | 102 | 102 |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

However, at a multiplicative model the level of significance of the multiplicative terms does not convey any real meaning (Ai & Norton, 2003). The study identifies that the interaction of regret with opportunity and attitude in model-6 improves the predictive capacity of the model compared to model-3 by 9%, although regret does not increase the predictive capacity of model-3.

Table-4.2a: Marginal Effects after Logit Regression

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Entp_Career_ Intention | Entp_Career_ Intention | Entp_Career_ Intention | Entp_Career_ Intention | Entp_Career_ Intention | Entp_Career_ Intention |
| Gender | 0.078 | 0.196 | 0.198 | 0.207 | .245* | 0.233* |
| | (0.120) | (0.135) | (0.135) | (0.138) | (136) | (0.137) |
| Parent_self_emp | 0.456*** | 0.393*** | 0.393*** | .435*** | .469*** | 0.435*** |
| | (0.112) | (0.125) | (0.126) | (.133) | (141) | (0.148) |
| Skill | 0.160 | 0.181 | 0.181 | .234* | .248* | 0.255* |
| | (0.110) | (0.114) | (0.116) | (.123) | (.133) | (0.149) |
| Financing | -0.273 | - 0.392* | - 0.393* | -0.237 | -0.479** | -0.337 |
| | (0.189) | (0.207) | (0.211) | (.221) | (0.218) | (0.233) |
| Network | 0.214 | 0.194 | 0.193 | .109 | .057 | 0.023 |
| | (0.159) | (0.186) | (0.189) | (.166) | (0.164) | (0.116) |
| Social_Status | 0.286** | 0.161 | 0.161 | .204* | 0.153 | 0.152 |
| | (0.108) | (0.110) | (0.111) | (.112) | (0.104) | (0.099) |
| Independence | 0.202 | 0.148 | 0.148 | .143 | 0.209 | 0.174 |
| | (0.126) | (0.135) | (0.135) | (.127) | (134) | (0.121) |
| Opportunity | | 0.130 | 0.126 | -0.233* | -0.046 | -0.167 |
| | | (0.116) | (0.116) | (.137) | (.098) | (0.110) |
| Attitude | | 0.618*** | 0.618*** | .615*** | 0.343** | 0.325* |
| | | (0.115) | (0.116) | (.127) | (0.170) | (0.181) |
| Regret | | | -0.004 | -0.308* | -0.269* | -0.515** |
| | | | (0.107) | (.186) | (.179) | (0.246) |
| RegretXOpportunity | | | | .376** | | 0.283* |
| | | | | (.148) | | (0.146) |
| RegretXAttitude | | | | | 0.376*** | 0.294** |
| | | | | | (0.133) | (0.130) |
| Y=Pr(Entp_Career_ Intention)(predict) | **.716** | **0.819** | **0.819** | **0.855** | **0.857** | **0.902** |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 4.2 shows that gender, skill, financing, social status, and independence are significant in the interaction model. This finding explains the importance of counterfactual thinking in entrepreneurial intention. Since logit gives us the log odds for each variable, the magnitude of the log odds of each variable depends on other variables in the model.

Table-4.2b: Logit Regression of Entrepreneurial Career Intention (using original scale data)

| VARIABLES | (1) Entp_Career_Intention | (2) Entp_Career_Intention | (3) Entp_Career_Intention |
|---|---|---|---|
| Gender | 0.192 | 0.738 | 0.747 |
| | (0.577) | (0.770) | (0.769) |
| Parent_self_emp | 2.020*** | 2.013*** | 2.044*** |
| | (0.588) | (0.740) | (0.743) |
| Skill | 0.432* | 0.588* | 0.573* |
| | (0.234) | (0.341) | (0.339) |
| Financing | -0.190 | -0.490** | -0.473* |
| | (0.195) | (0.250) | (0.252) |
| Network | 0.240 | 0.454 | 0.457* |
| | (0.210) | (0.276) | (0.276) |
| Social_Status | 0.277* | 0.190 | 0.190 |
| | (0.161) | (0.221) | (0.221) |
| Independence | 0.428** | 0.202 | 0.203 |
| | (0.200) | (0.266) | (0.266) |
| Opportunity | | 0.218 | 0.218 |
| | | (0.310) | (0.308) |
| Attitude | | 1.336*** | 1.338*** |
| | | (0.360) | (0.358) |
| Regret | | | 0.0719 |
| | | | (0.186) |
| Constant | -6.211*** | -13.13*** | -13.48*** |
| | (1.817) | (3.356) | (3.518) |
| y=Pr(Entp_Career_Intention)(predict) | .721 | .828 | .827 |
| Pseudo R2 | 0.318 | 0.544 | 0.545 |
| LR chi2 | 41.66*** | 71.39*** | 71.54*** |
| Observations | 102 | 102 | 102 |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Graphical presentation of margin analysis shows the interaction effect of regret with opportunity and attitude in Figures 4.3 and 4.4. Figure 4.4 depicts the interaction between opportunity and regret. It shows that the probability of entrepreneurial career intention increases when both regret and opportunity are high. On the other hand, when regret is low, the probability of entrepreneurial career intention decreases with increased opportunity identification. This implies that the impact of opportunity identification declines in

entrepreneurial career intention if it is not supported by a higher level of regret. However, a low regret and low opportunity identification condition predict a higher probability of career intention. Figure-4.4 reveals that the impact of opportunity on entrepreneurial career intention increases with a higher level of regret and decreases with a lower level of regret.

Figure 4.4: Margin of Interaction of Opportunity and Regret

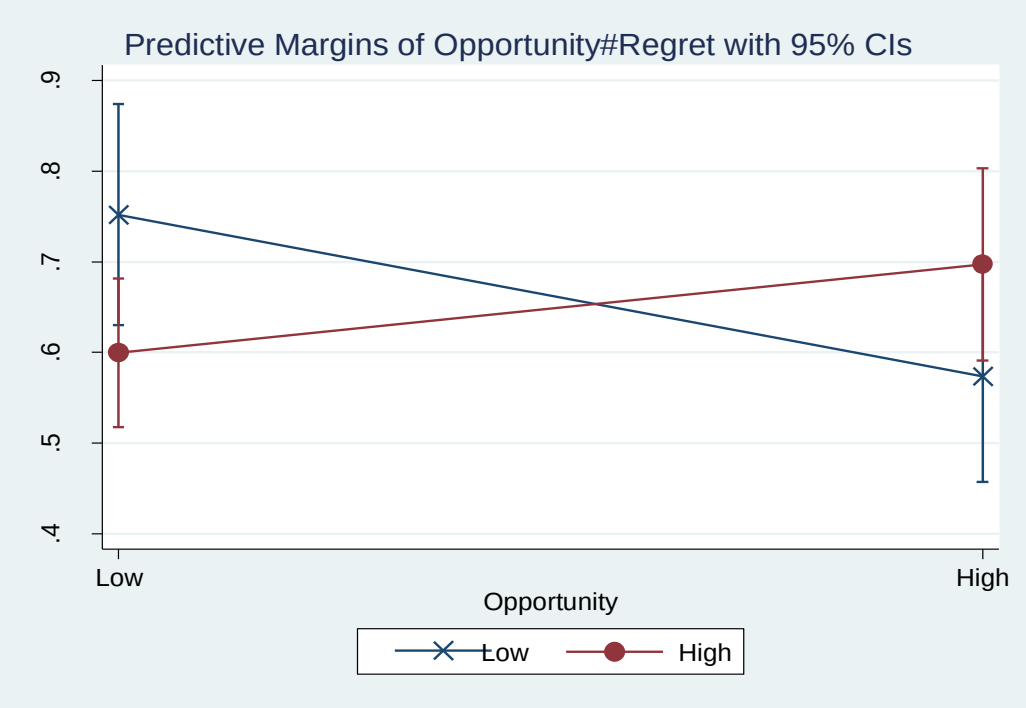
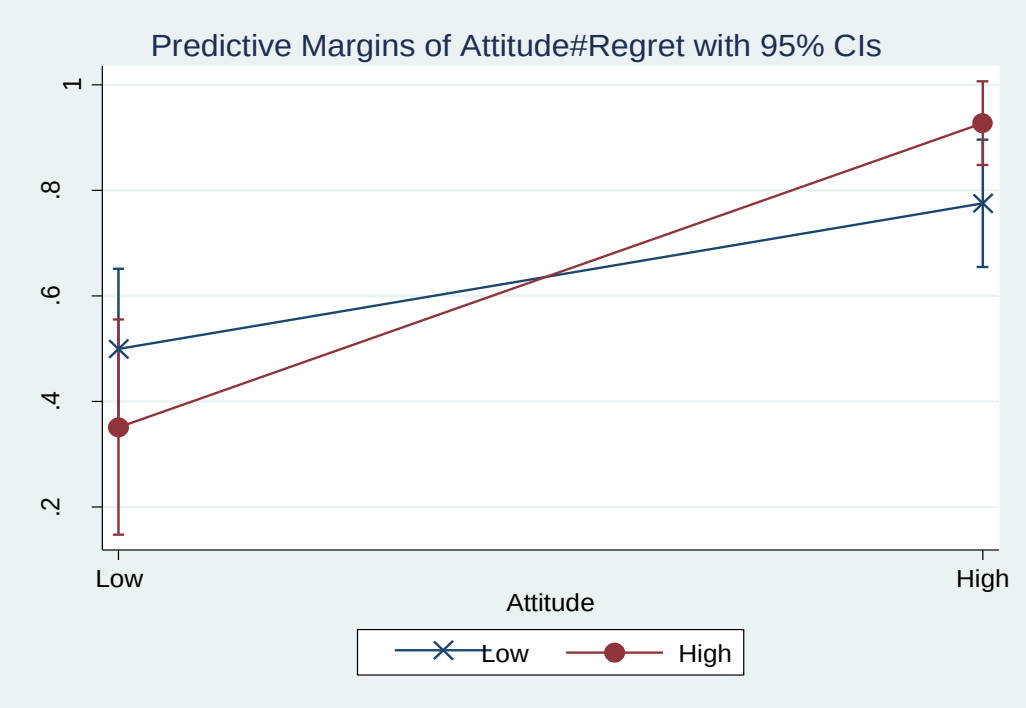



Figure-4.5 shows that the impact of attitude increases at a higher rate to predict entrepreneurial career intention, if respondents have a higher level of regret, and vice versa. This shows that the influence of attitude on entrepreneurial career intention is higher when respondents have a higher level of regret compared to a lower level of regret.

Figure 4.5: Margin of Interaction of Attitude and Regret




On the other hand, a higher level of regret decreases entrepreneurial career intention at a higher rate if the individual has a lower level of attitude. However, as in point estimation, the standard error of estimation is higher in the case of low attitude. On the left hand side of the Figure 4.5, we see that having regret has a negative influence on entrepreneurial career intention when attitude to entrepreneurship is low. The slope of the high regret line is higher than the slope of the low regret line. This indicates a positive moderation impact of regret (counterfactual thinking) on the entrepreneurial career intention.

## 4.5 DISCUSSION

The study set out to advance ongoing research on entrepreneurship and counterfactual thinking. This study exposed the impact of upward counterfactual thinking on entrepreneurial career intention through the individual's attitude and opportunity. The impact of attitude to entrepreneurial intention is moderated by counterfactual thinking. In all previous studies of

entrepreneurial intention and behaviour, attitude is identified as an essential construct to predict intention and behaviour. This study explains how attitude is moderated by counterfactual thinking. This adds to our knowledge about entrepreneurial intention and behaviour.

Our findings have a direct impact on upward counterfactual thinking and support the findings in Arora et al.'s (2013) study. They find an insignificant negative impact of upward counterfactual on self-efficacy – another important construct of behaviour. We have tried to explain the impact of upward counterfactual thinking on entrepreneurial career intention and found an insignificant negative impact. These insignificant direct influences invalidate the potential of significant influence of counterfactual thinking on entrepreneurial behaviour. However, upward counterfactual thinking or regret moderates the effects of attitude and opportunity significantly. The moderation of attitude by counterfactual thinking supports the findings in Schwarz and Bohner (2001), which explain the adjustment of attitude based on available information. Our findings showed that regretful thinking increases the effectiveness of attitude on entrepreneurial career intention. The moderators of attitude must be contextual since attitude is contextual. For example, the moderators in a health behaviour study may not be same as in a study of economic behaviour. The moderating effect of regret explains the effectiveness of our measure in the entrepreneurial intention context. In this situation, an explanation of insignificant direct influence may be the result of the developmental stage of episodic memory based on counterfactual thinking of a missed opportunity of a smartphone purchase. We conducted our study among 2nd and 3rd year undergraduate students. To analyse the direct relationship, further research should include a sample of respondents about to start their careers.

Figure-4.4 shows that when regret level is low, the influence of opportunity becomes negative. Equation 6 shows that the main effect of opportunity is negative when the

interaction effect of opportunity and regret is positive. This means that if opportunity identification is not supported by a high level of regret about a missed opportunity, the influence of opportunity will decline. The interaction effect of opportunity and regret supports Gaglio's (2004) proposition-9 that 'opportunity finders are more likely to generate uphill counterfactuals'. Our study shows that if opportunity identification is supported by upward counterfactual thinking or regret, it increases the probability to choose entrepreneurship as the career. This study adds to knowledge on the influence of attitude on entrepreneurial career intention. We have shown that the influence of attitude is modified by upward counterfactual thinking. This finding should help to identify an entrepreneurial mindset.

**4.6 LIMITATIONS**

The main limitation of this study is the sample. The sample size is small, and from the same business school. The survey respondents are students. Though the samples are valid, researchers and practitioners may be sceptical about the career choices of students in their second and third years of study.

We analysed the influence of a single content specific counterfactual thinking in entrepreneurial career intention. Our data are cross-sectional. To understand the accurate influence of counterfactual thinking on career decisions, the subjects need to be observed several times until they take up their careers. The current study is only a snapshot that explores a static relationship between counterfactual thinking, attitude, opportunity identification and entrepreneurial career intention. Another limitation is the single item construct. Although there is evidence that the single item construct has sufficient validity, some researchers are still debating this issue.

## 4.7 CONCLUSION

The study exposed the influence of counterfactual or regretful thinking on entrepreneurial career intention. We analysed the influence of content specific counterfactual thinking in entrepreneurial career intention among the students in a business school. In the study, we found that counterfactual thinking or regret has no direct influence on entrepreneurial career intention. However, it modifies the influence of attitude and opportunity identification in entrepreneurial career intention. Higher levels of counterfactual thinking increase the influence of both attitude and opportunity identification in entrepreneurial career intention. Lower levels of counterfactual thinking reduce the influence of opportunity identification negatively. This influence on attitude reduces the influence of attitude on a lower rate. The findings show the importance of counterfactual thinking to analyse the profile of an entrepreneur.

This finding is of interest for theory development and for policy related to entrepreneurship development. From a policy perspective, the findings should help in the selection of people for support programmes by identifying those with a higher intensity of counterfactual thinking about a missed opportunity. From a theoretical development perspective, it helps to improve the entrepreneurship behaviour theory, in turn, and helps us to achieve the overall objective of the study. Future study should include counterfactual thinking in the entrepreneurship behaviour model. Future work should also address the impact of upward content specific counterfactual thinking among respondents ready to embark on a career within six months.

# Chapter 5

## Conclusion

This chapter summarises the contributions of this study on the determinants of entrepreneurial intention and behaviour. The aim of the study was to improve entrepreneurship behaviour theory. To achieve this we posed three research questions: 1) What causes an inverse U shape relationship between age and entrepreneurship? 2) How does the weighted competency variable improve behavioural control in entrepreneurial intention and behaviour analysis? and 3) What is the relationship between counterfactual thinking and entrepreneurial intention? To address question 1, we summarised the role of age in entrepreneurship behaviour. We analysed the role of age in early stage entrepreneurial activity and in serial entrepreneurial activity in Chapter 2. We found that age has both a direct and indirect influence on entrepreneurship behaviour, and the influence is different in early stage entrepreneurial activity and in serial entrepreneurial activity. This is an important addition to the knowledge on the determinants of entrepreneurial behaviour.

Based on the findings in Chapter 2, we linked the direct role of the demographic variables (including age) in entrepreneurial intention and behaviour analysis in Chapter 3. Existing behaviour theories assume that there is no direct relation between demographic variables and entrepreneurship behaviour (Ajzen, 2002, 2011). The theory assumes that the influence of demographic variables in entrepreneurship behaviour is captured by attitude. Since we found both a direct and an indirect relationship between age and entrepreneurship behaviour in Chapter 2, we studied the influence of demographic variables in chapter 3. We found a significant direct influence of the demographic variables on entrepreneurial intention and behaviour. This extends our knowledge on the influence of demographic variables in entrepreneurship behaviour. Since demographic variables have both a direct and indirect

influence on entrepreneurial intention and behaviour, we can say that demographic factors should be part of an analysis of entrepreneurial behaviour.

Behavioural theories assume that the perceived behavioural control variables influence the relationship between intention and behaviour. According to the TPB, the perceived behavioural control variable can explain the differences between intention and behaviour (Ajzen, 1991; 2011). However, previous studies found a mixed influence of the perceived behavioural control variable in entrepreneurship analysis. In our study, we were interested in whether the weighted competencies have a significant influence on entrepreneurial behaviour as opposed to the perceived behavioural control variable. This was the topic of question no. 2. We studied the influence of the weighted competency variables in Chapter 3. We conducted a pilot study in the UK and a national level study in Bangladesh. We tested the influence of competencies and weighted competencies on entrepreneurial intention and behaviour respectively. We linked the significant relationship between weighted competencies and entrepreneurial behaviour. We found a significant positive relationship between weighted competencies and behaviour. However, the influence of some behavioural control variables (e.g. network) changes with the country. The investigation of this research question makes two interesting contributions. First, competencies and weighted competencies have a significant influence on entrepreneurial intention and behaviour respectively. This explains the significant relationship between behavioural control and behaviour. We contribute to the literature by replacing weighted competencies for perceived behavioural control in the theory of planned behaviour (Ajzen, 1991, 2002, 2011, 2012). Second, demographic variables have a significant direct influence on entrepreneurial intentional and activity. TPB assumes that demographic variables have indirect influence in intention and activity (Ajzen, 2011). These indicate that inclusion of demographic variables and weighted competencies improves behaviour theory.

The first two research questions tested the influence of the demographic variables and weighted competency variables to improve entrepreneurship behaviour theory. Research question 3 is related to the influence of counterfactual thinking in entrepreneurial intention. We tested both the direct and indirect influence of counterfactual thinking in entrepreneurial intention. We identified how counterfactual thinking modifies the influences of attitude and opportunity identification in entrepreneurial intention. Attitude and opportunity identification are important determinants of entrepreneurial intention and behaviour. The influence of these two variables in entrepreneurial intention may be modified by counterfactual thinking. We found that counterfactual thinking significantly modifies the influence of attitude and opportunity identification in entrepreneurial intention. The result enriches our knowledge about the key determinants of entrepreneurship. It contributes also to entrepreneurship behaviour theory. The following sections summarise the results and the study contributions.

## 5.1 AGE AND ENTREPRENEURSHIP BEHAVIOUR

Recent studies suggest that there is an inverse U shaped relationship between age and entrepreneurship. In our analysis, in Chapter 2, we identified that this inverse U shape is the result of the cognitive development in different age groups. We analysed the influence of age related cognitive development on opportunity identification and skills. Our results show that age related cognitive development in young adults positively influences opportunity identification to start a business. This influence continues until middle age after which it declines. We found a similar influence of age on skills. Cognitive development of young adults positively influenced skills to start a business. This influence declines to some extent in middle age and declines sharply in old age. This is due to disuse of skills in middle and old ages. As per the retrieval principle of disuse theory, the information becomes less retrievable from the memory if it remains unused. As a result, the influence of skill is highest for the young adults. But the influence declines for other two age groups. The above findings

explain the inverse U shape relationship between age and entrepreneurship. However, the influence of cognitive age on opportunity identification in serial entrepreneurship is growing with increasing age because of the schema effect of earlier start-up experience. This influence is greatest in old age within the working age span. Because of the repetitive use of skills, we found the same influence of age on skill for serial start-ups. In most cases of these indirect effects, the direct effects of age were highly significant. This result contrasts with the theory of planned behaviour which predicts that demographic variables will indirectly influence entrepreneurial intention and behaviour through attitude.

The results in chapter 2 contribute to explaining why there is an inverse U shape relationship existing between age and entrepreneurship. Earlier studies found an inverse U shape relationship between age and early stage entrepreneurship. In this study we tested the influence of different age groups in opportunity identification and skill, in early stage, and in serial entrepreneurship, and found both a direct and indirect influence of age in early stage and serial entrepreneurship. This result shows that age modifies the influence of opportunity identification and business start-up skills in both early stage and serial entrepreneurship. This therefore enhances our understanding in the relationship between age and entrepreneurship, and will also contribute towards customising entrepreneurship development policy of a country or related public policies based on age. For example, young adults should be given priority in entrepreneurship development training since business start-up skill has the most influence on young adults. Since age has both a direct and an indirect influence on entrepreneurship, we expect other demographic variables also to have a direct influence on entrepreneurship, which contrasts with the assumption in the theory of planned behaviour. The result of the relationship between age and entrepreneurship in Chapter 2 encouraged us to test the direct effect of demographic variables on both entrepreneurial intention and behaviour in Chapter 3.

## 5.2 COMPETENCY VALUE THEORY OF ENTREPRENEURSHIP (CVTE)

Intention and behaviour theories in psychology do not include demographic variables in analyses of behaviour. However, based on earlier studies and our research findings in Chapter 2, it is evident that demographic variables have a direct influence on entrepreneurial behaviour. Among the various theories, the theory of planned behaviour (TPB) assumes that demographic variables indirectly influence intention and behaviour through attitude (Ajzen, 2011). On the other hand, the predictability of the behavioural control variable in the TPB is questionable. In a hypothetical analysis in Chapter 3, we showed that the way to improve the predictability of the behavioural control variable is to use the weighted competency instead of the perceived behavioural control variable. To accommodate the demographic and weighted competency variables we extended the theory of planned behaviour to the investigation of entrepreneurship. TPB has three dependent variables – attitude, subjective norms and PBC. Since this constitutes a major change to TPB to study behaviour in entrepreneurship, we proposed a new theory for entrepreneurship behaviour which we call Competency Value Theory of Entrepreneurship (CVTE), to highlight the importance of competencies as items of behavioural control in entrepreneurship.

### 5.2.1 Demographic Variables, Entrepreneurial Intention, and Behaviour

In the study of entrepreneurship intention and behaviour in Chapter 3, we found that demographic variables have a direct impact on entrepreneurial intention and behaviour. In our analysis, we used age, gender and parents' self-employment. We controlled for attitude and found that the direct influence of demographic variables remained highly significant. This finding justifies the inclusion of demographic variables in entrepreneurship behaviour analysis. In Chapter 2, we analysed the influence of age on opportunity identification and skills in entrepreneurial activity. We found that age has a highly significant influence on both the variables in entrepreneurial behaviour. Chapter 3 showed that the influence of age and

parent's self-employment becomes insignificant at national level when we include behavioural control variables in the model. The influence of gender was significant in all the models. Opportunity identification and skills are two of the behavioural control variables. They show that some demographic variables influence entrepreneurial behaviour indirectly through the behavioural control variables, and when the demographic variables have a direct influence on entrepreneurial intention and behaviour. However, in Chapter 3, parents' self-employment had a significant influence on intention in the pilot study, and age had a highly significant influence on intention in the national level study. Based on the above, we can say that the direct influence of demographic variables should be considered for both entrepreneurial intention and behaviour.

### 5.2.2 Behavioural Control and Weighted Competency

TPB uses PBC to control behaviour. The EE model (Shapiro & Shokol, 1982) uses perceived feasibility, which is equivalent to self-efficacy in human agency theory (Bandura, 2002). In previous entrepreneurship studies, self-efficacy is measured using personal ability and competency variables. In contrast, PBC has been defined as the product of strength of ability times power of ability (Ajzen, 2002). In Chapter 3, we explained that self-efficacy is not sufficient to control behaviour. In addition, PBC may inflate the response bias, instead of controlling it when we multiply strength by the power of a component. In this case, for expected behaviour analysis, we propose to include weighted competencies, weighted based on their perceived value or power. In this study, we used the ratio method to calculate weighted competencies. We employed five competencies to measure the behavioural control variables - opportunity identification, social network, skill and knowledge, financing and ability to work independently. We found that weighted skill, weighted finance and weighted opportunity had a highly significant influence on early stage entrepreneurial activity. The influence of weighted independence and weighted network was insignificant.

Earlier studies in psychology and entrepreneurship have found a mixed influence of perceived behavioural control. Instead of perceived behavioural control we used weighted competency for behavioural control. In our study, we found a highly significant influence of weighted competencies on entrepreneurial activity. This extends our understanding of the behavioural control variable. The study provides evidence that weighted competencies have a significant influence on entrepreneurial activity, and thus have significant control on entrepreneurial behaviour. However, the opposite applies to the influence of weighted network on entrepreneurial intention. The influence of network on entrepreneurial intention in the UK pilot study and the national study in Bangladesh is opposite. This revealed a contextual influence of network in entrepreneurial intention based on the country context. This is explained in the next section.

#### 5.2.2.1 Weighted Network and Entrepreneurial Intention in Bangladesh

Earlier studies of entrepreneurship find a significant positive influence of network on entrepreneurial intention. Our pilot study in the UK mirrored this result, while the national level study in Bangladesh found contrasting results. The national level study showed that network has a significant negative influence on entrepreneurial intention. We also found a negative influence of weighted network on entrepreneurial intention in Bangladesh. Interestingly, the influence of network and weighted network in Bangladesh were significantly positive for entrepreneurial activity. This indicates that existing entrepreneurs negatively influence potential entrepreneurs in Bangladesh. On the other hand, those trying to become entrepreneurs in Bangladesh are positively influenced to start a business. The influence of parents' self-employment in Bangladesh is also negative for entrepreneurial career intention.

Most of the previous studies in entrepreneurship in developed countries found a positive influence of parents' self-employment in entrepreneurial intention. In the pilot study in UK we also found a positive influence of parents' self-employment in entrepreneurial intention.

However, similar to network, we found a negative influence of parents' self-employment on entrepreneurial intention in Bangladesh. This is may be the result of severe negative start-up experiences of existing experiences in Bangladesh. Bangladesh ranked 83rd in the World Bank Doing Business index in 2013 (World Bank, 2014). In this Bangladesh ranked 189th for electricity supply, 177th for property registration, and 185th for enforcing contacts. These say a lot about the negative experiences of the existing entrepreneurs. In a developed country like UK, entrepreneurs are not facing any severe administrative or infrastructural problem to start a business. UK is ranked 18th in the World Bank Doing Business index in 2013 (World Bank, 2014). The findings reveal that the influence of business networks in entrepreneurial intention and activity in a country may be modified by the level of administrative support and the infrastructure of the country. This supports the negative influence of network for entrepreneurial career intention in Bangladesh. This is an important contribution to the existing knowledge on the influence of network from a developing country perspective.

### 5.3 COUNTER FACTUAL THINKING AND ENTREPRENEURIAL INTENTION

Chapter 4 analysed the relationship between counterfactual or regretful thinking and entrepreneurial intention. There are two types of counterfactual thinking – content specific counterfactual thinking, and content neutral counterfactual thinking. Earlier studies in counterfactual thinking in entrepreneurship are limited to differences between entrepreneurs and non-entrepreneurs based on counterfactual thinking. Ours is the first study to analyse the relationship between content specific counterfactual thinking and entrepreneurship. We found that counterfactual thinking has no direct influence on entrepreneurial intention. However, counterfactual thinking significantly modifies the influence of attitude and opportunity identification to influence the entrepreneurial career intention.

So, in entrepreneurship theory, counterfactual thinking may be a background variable for attitude and behavioural control variables. However, we need to conduct more nationally representative surveys of counterfactual thinking and entrepreneurial intention. The finding for counterfactual thinking and entrepreneurial intention extends our knowledge about how counterfactual thinking influences an individual's entrepreneurial intention. The findings enrich our knowledge of existing behaviour theory and help to achieve the research objective of this study.

## 5.4 CONCLUSION

In this dissertation we explained the determinants of entrepreneurial intention and behaviour from a social psychological perspective. We studied the influence of demographic variables, weighted competency variables, and counterfactual thinking in entrepreneurial intention and behaviour. We explored the impact of demographic variables in entrepreneurial intention and behaviour in detail, particularly the impact of age in entrepreneurship. We also explained the limitations of existing behavioural theories in psychology to study entrepreneurship. To overcome the limitations of our study, we proposed the competency value theory of entrepreneurship (CVTE) by modifying the theory of planned behaviour (TPB) in psychology to study entrepreneurship. We studied CVTE theory in a pilot survey and in a national survey. The results supported our proposed theory–the competency value theory of entrepreneurship (CVTE). We further analysed the impact of counterfactual thinking on entrepreneurial intention to improve our entrepreneurship behaviour theory. We found an indirect influence of counterfactual thinking on entrepreneurship career intention.

The study makes five important contributions to the knowledge in the field. These are: 1) age has different types of influence in three different life cycle stages – young adult, middle age, and old age. The different types of influence are the results of information processing speed

and use of business start-up skills in different life stages. These results contribute to our understanding of why there is an inverse U shape relationship between age and entrepreneurship; 2) The influence of age in different stages in the life cycle is different for early stage entrepreneurship activity and for serial entrepreneurship activity. The influence of age in early stage entrepreneurship is growing positively with increased age until middle age, after which the influence declines. On the other hand, in serial entrepreneurship the influence of age is also growing positively with increased age; however, the influence is the highest in old age; 3) Demographic variables have both a direct and an indirect influence on entrepreneurship behaviour. The inclusion of demographic variable in entrepreneurship behaviour theory should improve the theory; 4) Weighted competency has a significant influence on entrepreneurial activity as a behavioural control variable. So, by replacing weighted competencies instead of perceived behavioural control, we can improve entrepreneurship behaviour theory; 5) Counterfactual thinking has an indirect influence on entrepreneurial intention. By including the counterfactual thinking as a background variable in entrepreneurship behaviour theory, we can improve the theory further. This will help us to explain the influence of the determinants of entrepreneurship more accurately. Understanding the influence of the determinants of entrepreneurship will help us to develop the policy and programmes more accurately, to then promote entrepreneurship in a country.

## 5.5 FUTURE RESEARCH

Future research should address at least three issues. Firstly, future research could investigate the predictability of CVTE theory in a longitudinal study; this would test the relationship between intention and behaviour by controlling the behavioural controllability of the weighted competency variable, and would help to explain the gap between entrepreneurial intention and behaviour. Since intention and behaviour are not taking place together, the relationship between intention and behaviour of an individual needs to be

studied at two different points of time in a longitudinal study. By conducting the longitudinal study we can test if weighted competency can explain the variations between entrepreneurial intention and behaviour. Previous studies in entrepreneurship found a wider gap between the rates of entrepreneurial intention and activity (Blanchflower & Oswald 1998; Henley, 2007). However, earlier studies could not identify the reasons for the differences. On other hand, PBC of TPB has limited success to explain the difference between entrepreneurial intention and activity. Since we found a significant influence of weighted competency variables in entrepreneurial intention and activity, weighted competency variables may explain the differences between intention and activity. So, we need to test whether weighted competency can explain the differences between entrepreneurial intention and activity in a longitudinal study. This will help us to test the CVTE theory, and also to improve the entrepreneurship development programmes.

Secondly, we should also study the influence of counterfactual thinking in entrepreneurship behaviour. In future research, we need to separately test the influence of content specific and content neutral upward counterfactual thinking, in a longitudinal study. We should also consider the fixed effect of career change on intention and behaviour. Any significant direct influence of counterfactual thinking would allow us to include counterfactual thinking in the CVTE model. Existing behaviour theories do not consider the impact of counterfactual thinking in entrepreneurship intention and behaviour, however, this study found a significant indirect relationship between counterfactual thinking and entrepreneurial intention. Studies in psychology found that content specific counterfactual thinking has direct influence in entrepreneurial intention and behaviour. So, we should test the influence of content specific counterfactual thinking in entrepreneurial intention and behaviour in a longitudinal study. This will help us to explain the potential of an individual to be engaged in entrepreneurial activity, if he or she engages in counterfactual thinking for missed opportunity. The research will contribute to the CVTE theory to explain entrepreneurial activity more accurately. It will

also help us to improve entrepreneurship development programmes based on the level of the counterfactual thinking of the potential entrepreneurs.

Thirdly, a future study could test the influence of administrative and infrastructural conditions on the network in entrepreneurship. In the present study we found that the influence of network is negative in entrepreneurial intention in Bangladesh; the influence of network is positive in entrepreneurial intention in the UK. This difference may be the result of the administrative and infrastructural experience of the existing entrepreneurs. World Bank's doing business index provides the ranking of administrative regulations and infrastructural conditions in different countries. So, the moderation effect of the 'doing business index' upon network will help us to test the influence of network in entrepreneurship in different countries. This will help us to understand the reasons of the differences in the network. So, testing the influence of World Bank's doing business index in the network in entrepreneurship will help us to understand the differences in the influence of network.

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# APPENDIX

Some of the Statements of Single Item constructs

Skill – I have sufficient knowledge and skill on starting and running a business.

Finance – I have sufficient fund to start a business

Network – My friends, family members or the people known to me can help me to start a business

Attitude- Self-employment is better than working for others

Opportunity – I have some very good, profitable, and executable business ideas

Social Status – Self-employment gives better social status than working for others

Independence – I do prefer to work interpedently

Regret – I do not regret if I missed a sale to buy a latest model of blackberry/i-phone/Nokia/htc only for £75 (pay as you go) which resell value is £200 now.