ANGEL INVESTMENT DECISION MAKING AS A LEARNING PROCESS

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Working Paper 10-05
Hunter Centre for Entrepreneurship,
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November 2010
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ABSTRACT

This paper extends the literature on the investment decision-making of business angels. Using insights from entrepreneurial learning theory, particularly the use of heuristics and the nature of learning from meagre experience, we explore whether angels learn from experience, how they learn and what they learn. These issues are addressed using verbal protocol analysis, a methodology for examining decision-making in real time, on three groups of business angels with differing levels of investment experience, and on follow-up interviews with these angels. This reveals some differences in the speed of decision making and the emphasis given to various investment criteria. There is some evidence for the use of heuristics in the decision making process, and for the critical role played by vicarious learning from the experience of others. Learning in the individual angel decision making process is a social as well as individual phenomenon.

Key words: business angels, investment decisions, experiential learning, vicarious learning, heuristics, social learning
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INTRODUCTION

There is now a small but significant literature on how business angels make their investment decisions (see Mason, 2006; Riding et al, 2007 for reviews). These studies are of three types. The first type is process studies. Riding et al. (1993) and Haines et al. (2003) have identified a number of discrete stages in their investment decision, similar to that used by venture capital funds (Fried and Hisrich, 1994), comprising the following: deal origination; deal evaluation – which can be divided into initial screening and detailed investigation; negotiation and contracting; post-investment involvement; and exiting. The second type is criteria studies, which examine the factors which angels use to evaluate investment opportunities. This category can be further divided into three sub-categories. One sub-category of studies provides a generalized retrospective view of angels’ investment criteria with responses normally gathered through postal surveys (e.g. Mason and Harrison, 1994; 2002). The limitations of this approach are that they do not distinguish between the type of investment opportunity or between factors used at the screening stage and the detailed evaluation stage. Post-hoc rationalisation is also problematic. Another sub-category is case studies of how individual investors or specific angel groups make their investment decisions. For example, Mason and Harrison (1996) examined deals rejected by a UK business angel investment group. The third sub-category is real time studies, which have emerged in response to the weaknesses in the generalized retrospective approach. Mason and Rogers (1996; 1997) used verbal protocol analysis – essentially asking respondents to ‘think out loud’ as they perform a task, in this case undertaking the initial screening of an investment opportunity. Others have used conjoint analysis – an analytical tool primarily used in marketing, to study factors that influence
purchasing decisions which is based on asking respondents to make a series of trade-offs (e.g. Landström, 1998; Ludvigsen, 2009). A variant on these verbal protocol studies are studies which have examined the real time reactions of investors to oral presentations by entrepreneurs (Mason and Harrison, 2003; Clark, 2008). Finally, some studies have sought, using various methodologies, to compare the investment decision-making processes and investment criteria of business angels and other types of investor (e.g. Mason and Stark, 2004).

A major gap in this literature on angel investing is the effect of experience on investment decision-making. Indeed, previous studies implicitly assume angel investors know what they are doing and that their approach to investing does not change with experience. As a first contribution to addressing this omission we apply insights from the entrepreneurial learning literature to explore the process of learning in angel investing. The paper has three objectives. First, we address the following questions. Do angel investors learn from experience? If so, how do they learn? And how does this learning influence their approach to investing? Second, we discuss the extent to which angels, whether experienced or novice, use heuristics, that is, the decision rules used to reduce complex judgemental tasks to relatively simple cognitive operations (Holcomb, Ireland, Holmes and Hitt 2009), as the basis for vicarious learning from the experience of others. Third, we ask how investors without prior investment experience learn. Many angels make only a small number of investments (Mason and Harrison, 1994; 1996; 2002; Harrison and Mason, 2007) and this may not be sufficient to derive the necessary experience to improve their investment ability. Reflecting on March et al.’s (2003) analysis of learning from samples of less than one we explore how inexperienced angels (with one or fewer investments) learn from experience and convert infrequent events into interpretations that form the basis interpreting subsequent knowledge-shaping experiences. Evidence on these issues has the potential to make a valuable contribution to angel education.
ENTREPRENEURIAL LEARNING

Entrepreneurial action is predicated on learning, and in recent years there have been a number of models developed to account for how entrepreneurs learn (Harrison and Leitch 2005a, 2008). These variously emphasise learning through the accumulation of experiential knowledge (Politis 2005; Cope 2005), the role of learning asymmetries that offer opportunity exploitation advantages (Corbett 2005, 2007; Rae and Carswell 2001) and the accumulation, assimilation and use of entrepreneurial knowledge (Wang 2008; Levesque et al 2009). Much of this research is based, directly or indirectly, on adaptations of Kolb’s (1984) experiential learning theory, which sees learning as a cyclical process of learning from experience through reflection and conceptualisation to action and thence on to further experience (Kayes 2002). In the first overview collection of papers on entrepreneurial learning (Harrison and Leitch 2005a) it has been argued that there is a need for greater research into the process dynamics of learning in entrepreneurial contexts, recognising that such learning is experiential, that learning is a process that alters permanently the character of behaviour, that learning is an individual process (even if it occurs in a social or organisational context – Dutta and Crossan 2005), and that learning is organised by existing routines, rules and practices (Harrison and Leitch 2005b, 364). Furthermore, this review concluded that “there is a distinction between the knowledge stock of an entrepreneurial venture (or entrepreneur) and the process through which that knowledge has been created. Further research is needed on this important relationship” (Harrison and Leitch 2005b, 364).

In this paper we respond to this challenge by examining the extent to which learning is experiential and linked to potential changes in behaviour. We do this in an exploratory study of the investment decision-making process of a sample of business angel investors with different levels of investment experience. In so doing, we add to the literature by examining specifically
the case of learning from experience when there is no (or little) experience to learn from, which is the position of an angel investor contemplating their first investment. As there are still no comprehensive theoretical frameworks to explain how entrepreneurial actors learn (Cope 2005), we ground our analysis in two sets of insights: the role of heuristics in learning (Holcomb et al, 2009) and the process of learning from experience when there is little experience to learn from (March, Sproull and Tamuz 1991).

A connection has recently been established between learning and heuristics (Holcomb et al, 2009). A distinction can be made between experiential learning, that is, learning from experience and the accumulation and storing of that learning as knowledge, on the one hand and vicarious learning, that is, learning by observing others’ behaviours and its consequences and the assimilation of this information and using it as the basis for action. Building on this distinction, Holcomb et al (2009) identify three heuristics that influence learning (Tversky and Kahneman 1973, 1974), given that both experiential and vicarious learning are associated with the acquisition of incomplete or ambiguous information.

First, the *availability heuristic* refers to the extent to which there are traces of event instances (e.g. new venture creation or angel investing) in memory and the ease with which certain associations come to mind. The extent to which memory contains traces of events is relevant here: the more extensive these are, the more likely enactment of similar behaviour will be. In the case of angel investing, we would expect that the greater the experience of investing (and therefore the greater availability of event instances in memory) the more confident angel investors will be in appraising investment opportunities. Second, the *representativeness heuristic* refers to the tendency to identify the central or most significant feature of a category of events and apply it to all examples of that category, such as the set of factors associated with success in venture capital investing,
hence improving decision-making effectiveness (Zacharakis and Shepherd 1999). The greater the experience of the angel investor, therefore, in our context, the greater their ability to make effective screening judgements. Third, the anchoring and adjustment heuristic suggests that in making a decision, individuals settle on an anchor value, based on prior experience, partial analysis or by intuitive judgement, and progressively adjust this in the light of experience. While largely outside the scope of the present paper (as this heuristic is most likely to apply in decisions about, for example, the valuation of a prospective investment and the proportion of equity to be taken, rather than at the initial screening stage) this heuristic suggests that in making such decisions the investor’s anchor values will have an important bearing on the outcome.

In the analysis that follows we will refer to the distinction between experiential and vicarious learning and the role of the availability and representativeness heuristics in accounting for the observed learning processes of a sample of business angel investors of different degrees of experience. In particular, we will point to the importance of vicarious learning as a learning process and as the underpinning for the operation of heuristics in the learning process. March et al (1991) have identified two mechanisms by which meagre experiences (or none at all) can be converted into interpretations of history (ie learning). First, history can be experienced more richly: rather than taking a historical event (in our context, an investment or an investment presentation or pitch) that history can be experienced in multiple aspects, by focusing on critical events and by experiencing more interpretations of that event (emphasising the social as well as individual aspect of the learning process). Second, individuals and organisations can simulate history, either by conceptualising near-histories (what might have happened if circumstances were a little different) or by developing hypothetical histories (heuristics and simulations) that may have interpretative significance greater than the history actually experienced.
HOW BUSINESS ANGELS EVALUATE INVESTMENT OPPORTUNITIES

Mason and Rogers (1997) have provided important insights into how business angels evaluate investment opportunities. When they first become aware of an investment opportunity their first question is to consider how well it ‘fits’ with their own personal investment criteria, an anchoring decision (Tversky and Kahneman 1974). This may include location, amount sought, knowledge of an interest in the sector and ability to add value. Angels then undertake a quick review of those opportunities which fall within their personal investment criteria. Their aim at this point in the decision-making process is simply to assess whether the proposal has sufficient merit to justify the investment of time to undertake a detailed assessment, based on the application of a representativeness heuristic (Tversky and Kahneman 1974). Angels approach this stage with a negative mindset, expecting that the opportunity will be poor (because of the opportunities that they have previously seen) and looking for reasons to reject it. This approach has been termed ‘three strikes and you’re out’ (Mason and Rogers, 1996; 1997) and is supported by evidence that the rejection of opportunities is generally based on several factors rather than a single deal killer (Mason and Harrison, 1996). The market and the entrepreneur are the key considerations at this stage. Less significant are the product/service and financial factors. Indeed, angels exhibit considerable scepticism about the value of financial information in the business plan of start-ups. Nevertheless, investors want to see that there is the potential for significant financial return, that the principals are financially committed and what the money that is invested will be used for. Some angels will be flexible, willing to treat these criteria as compensatory (e.g. a strong management team would compensate for a distant location), whereas others will regard them as non-compensatory (Feeney et al, 1999).
The purpose of the initial screen is to filter out ‘no hopers’ in order to focus their time on those opportunities that appear to have potential. These are subject to more detailed appraisal. The investor will read the business plan in detail, go over the financial information, visit the premises, do some personal research to gather additional information on market potential, competition and so on, and assess the principals. Indeed, getting to know the principals personally (by a series of formal and informal meetings) is the most vital part of the process (May and Simmons, 2001). This stage has received little attention from researchers. According to May and Simmons (2001: 101) “it might consist of a few phone calls and a visit or two, or weeks of meetings, documents flying back and forth and questions, questions, questions.” However, it would appear that most angels emphasise their intuition and gut feeling rather than performing formal analysis (Haines et al, 2003). At this detailed evaluation stage the importance of people factors becomes critical (Riding et al, 1995), with investors emphasising management abilities, an understanding of what is required to be successful, a strong work ethic, integrity, honesty, openness and personal chemistry (Haines et al, 2003; Mason and Stark, 2004). Indeed, angels give greater emphasis to these issues than venture capital fund managers (Mason and Stark, 2004). This emphasis on the people reflects the long and personal nature of the angel-entrepreneur relationship. Rewards, realism of the projections and potential also assume greater importance while ‘investor fit’ becomes less of a consideration (Riding et al, 1995).

Angels typically reject most of the opportunities that they see. In their Canadian study Riding et al (1993) found that 72.6% of opportunities were rejected at the initial impressions stage, a further 15.9% were rejected following more detailed evaluation, and as this stage proceeds another 6.3% were eliminated, a cumulative rejection rate of 94.8%. Thus, business angels proceed to the negotiation stage with only 5% of the investment opportunities that they receive.
This paper extends this literature on investment decision-making by business angels by exploring whether business angels learn from experience, how they learn and how this learning is reflected in their approach to investing. We do so, first, by comparing how investors with differing levels of investment experience approach the appraisal of investment opportunities, and second, by asking investors to reflect on their learning.

**METHODOLOGY**

This paper uses verbal protocol analysis, a technique which involves respondents ‘thinking out loud’ as they perform a particular task, in this case reviewing a potential funding opportunity. The technique has been used successfully to examine the decision-making process of both venture capitalists and business angels (Hall and Hofer, 1993; Zacharakis and Meyer, 1995; Mason and Rogers, 1996; 1997; Mason and Stark, 2004) and has also been applied in a variety of other contexts (see Ericsson and Simon, 1993). The verbalisations of respondents are recorded, transcribed and then the content is analysed by means of a coding scheme devised for the specific research questions. The results of this analysis are generally presented as frequency counts.

This methodology provides a more reliable and much richer understanding of the decision-making process of investor and the criteria used to evaluate investment opportunities than is possible from approaches that use questionnaires, surveys and interviews (Shepherd and Zacharakis, 1999). Self-reported, retrospective data are subject to conscious or unconscious errors associated with *post hoc* rationalisation and recall bias. There are also cognitive perceptual limitations, with evidence that venture capitalists have limited insights into their decision-processes (Zacharakis and Meyer,
1998; Shepherd, 1999). The consequence is that they often overstate the number of criteria actually used, understate the most important criteria and overstate the least important criteria (Shepherd and Zacharakis, 1999). Hence, as Zacharakis and Meyer (1998: 72) note, “past studies provide a laundry list of factors that may be biased in that they list a multitude of factors that have a relatively small influence on the decision.” As a real-time experiment which does not require investors to introspect about their thought processes, verbal protocol analysis sidesteps these recall, post hoc rationalisation and cognitive biases (Shepherd and Zacharakis, 1999).

Moreover, as noted above, the evaluation of investment opportunities is a multi-stage process. Although the same considerations may be present at each stage their relative importance changes during the course of the decision-making process (Riding et al, 1993). A further limitation of questionnaire and interview surveys of decision-making is that they do not differentiate between these different stages in the decision-making process and as a consequence are likely to produce misleading findings.

The focus is on the initial screening stage – the stage when a funder has become aware of an investment opportunity and considers it with a view to obtaining sufficient initial impressions to decide whether it is worthy of detailed consideration or should be rejected out of hand. This stage is done fairly quickly, typically in less than 10 minutes (Sweeting, 1991; Hall and Hofer, 1993; Mason and Rogers, 1996; 1997), with angels rejecting most of the opportunities that they review. One study of Canadian business angels reported that they accepted just 6% of the investment opportunities for detailed consideration (Haines et al., 2003). In the context of the increasing organisational diversity of the angel market, and in particular the growth of syndicates (Mason 2006; Sohl 2007), it needs to be emphasised that all the angels in this study were conducting the screening for the purposes of direct personal investment and on their own behalf only. Investors
who lead small angel syndicates, and the gatekeepers (Paul and Whittam, 2010) for syndicates (who may or may not themselves be investors), may adopt a more formalised and structured approach to this assessment. The individual investors in such syndicates, who make decisions on the basis of screened deals being presented to them by the gatekeeper or lead investor group in the syndicate, may also follow different procedures. The applicability of our analysis and conclusions are, therefore, limited to the individual investor decision making process and cannot be generalised to other investors or investment contexts without further research (see Blair 1996; Knighton 1996 for examples of decision making within angel groups).

Nevertheless, verbal protocol analysis has some limitations. First, a frequency count of ‘thought units’ is an imperfect indicator of the importance of a factor in the final decision (Zacharakis and Meyer, 1995). No weightings are placed on the responses to measure emphasis and the topics mentioned most frequently are not necessarily those that have the ultimate influence on the decision. Nor does it allow for different convincer patterns. In other words, people may repeat something several times if they are unsure but say it only once if they are absolutely sure. Second, subjectivity is involved in coding, analysing and interpreting the transcripts (Riquelme and Rickards, 1992). Third, some respondents may be uncomfortable or self-conscious about thinking and speaking out loud which may distort their thinking (e.g. resulting in excessive repetition of what they are reading). Fourth, it is impossible to entirely remove the effect of the artificiality of the situation. Fifth, from a practical point of view it ignores the role of the source of funding opportunity which is an important initial influence on the investor’s attitude to the opportunity (Hall and Hofer, 1993). However, Ericsson and Simon (1980) argue that verbal protocol analysis is a valuable method of analysing decision-making as long as the following criteria are met: the information reported must be the focus of attention; the task is not highly routinised by habit; there

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1 David Grahame, personal communication, 6 May 2010
must be only a short time between performance and verbalisation; verbalisation does not require excessive encoding; reports are oral; subjects are free from distraction; instructions are clear; and completeness in reporting is encouraged. These conditions are all met in this study.

In order to examine the role of experience in the learning process, and in the absence of longitudinal data over significant period of time for a single set of investors, the study was based on a sample comprising three groups of business angels with contrasting investment experience. Each group comprised four angels, all based in Scotland, who were all identified with the help of LINC Scotland, the national association for business angels. The first group comprised experienced (or super) business angels who had each made five or more investments. The second group comprised novice angels who had each made just one investment. The final group comprised nascent angels who were seriously engaged in looking to make their first investment. The terminologies were taken from an earlier analysis of the character of the Scottish business angel market (Paul et al 2003). Each angel was shown a current real investment opportunity which was sourced from a business angel network. It was given a fictitious name to protect its anonymity and it was given a local address in view of the importance that the majority of angels give to investing in local businesses (Mason, 2007). This was a start-up health care/medical devices company seeking £500,000 ($750,000) in a seed finance round. The angels were asked to read the opportunity in the same way that they would normally read an investment proposal but verbalise their thoughts as they did so. The instruction that they were given was to say out loud the thoughts that came into their mind. Respondents were not required to provide any explanations or verbal

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2 This definition of super angels is with respect to the stage of development of the business angel market in Scotland, which in common with the rest of the UK, is characterised by a large number of relatively infrequent investors, many of them recent entrants into the market, and a few significantly more active investors, some of whom will have many more investments than this minimum threshold (see Mason and Harrison 2010). This contrasts with, for example, the more mature angel market in the US, where super angels can be defined as those making 50 or more investments (Richard Sudek, personal communication, June 2010)
descriptions (Ericsson and Simon, 1993). One of the authors was present as each respondent
performed this task and reminded respondents to think out loud if they lapsed into silence for more
than 15 seconds. The locations were either the angel’s home office, work office or a hotel.

Their thoughts were recorded and subsequently a complete transcript was made for each
respondent’s consideration of each investment opportunity. Following the approach of Mason and
Rogers (1996; 1997) these verbatim transcripts were then broken down into short phrases, or
‘thought segments’ – that is, phrases and sentences that are independent thought units – to permit
analysis. These thought units were then coded first into one of nine categories relating to different
types of investment criteria and secondly into seven categories of cognitive process (e.g.
description, inference, question). All authors were involved in triangulating the codings to ensure
robustness (Leitch, Hill and Harrison 2010). The frequency counts for each category of investor
were then aggregated and compared. A short de-briefing session was then carried out with each
investor after they had completed the evaluation which asked them to reflect on their own learning
as investors. In the case of nascent angels the discussion revolved around what they recognized
they did not know and needed to learn. Our expectations were as follows: we would be able to
observe differences between the three groups angels in terms of how they went about the
investment screening; and these differences could be ascribed to learning from experience,
influenced by the use of heuristics and vicarious learning both from the experience of others and
from strategies to learn from small samples of experience (March et al 1991).

RESULTS
There was no difference between the investor groups in terms of the investment decision. Three of the four angels in each category rejected the opportunity outright, with only one in each group sufficiently interested to want more information and meet the entrepreneur (Table 1).

INSERT TABLE 1 ABOUT HERE

The time taken to make the decision ranged from just under four minutes to just over 20 minutes (Table 1), although as Mason and Rogers (1997) previously noted, there is a strong sense that because of the artificiality of the situation angels went on reading the proposal for longer than they would in normal circumstances. Super angels made the quickest decision and exhibited the least variability. They were nearly two minutes quicker than nascent angels and nearly two-and-a-half minutes faster than novice angels who were the slowest group to make a decision. It seems reasonable to interpret the quicker decision time of the super angels in terms of their greater experience which enables them to ‘cut to the chase’, suggesting evidence of experiential learning and faster cognitive processes (Baron and Ensley, 2006). In particular, their decision processes show strong evidence for the role of a representativeness heuristic in decision making. The decisions of these investors are based on a focus on a limited number of factors which their prior experience has shown to be associated with a prospectively successful investment. This allows them to more quickly assess the likelihood that this proposition will generate sufficient returns to make it attractive to them.

Two observations can be made concerning the investment criteria used by these different types of angels (Table 2). First, there is broad agreement amongst the different types of business angels in
the relative importance of the funding criteria. A simple rank correlation test (Spearman's rho) confirms this: the responses of super angels are strongly correlated with those of novice angels ($\rho = 0.85$) and there are slightly weaker but still substantial correlations between nascent and novice angel rankings ($\rho = 0.74$) and between super angel and novice angel rankings ($\rho = 0.71$), confirming that in terms of their rankings of funding criteria there is a bigger difference between super angels and the other two categories. This provides some initial evidence that there is a learning from experience process at work. Finance is the most important criterion for both nascent and novice angels but ranks only fourth for experienced investors. This is consistent with previous research which notes that experienced angels do not place much emphasis on finances and are fairly cynical about the value of projections (Mason and Rogers, 1997). For nascent and novice angels this priority given to finance in the decision process is consistent with an availability heuristic based on their assimilation (in this case through vicarious learning from the representations of the experience of others rather than from their own direct experience) of prior event histories into memory on which they base their predictions of likely success factors and critical decision influencers (Holcomb et al 2009). As such, this is consistent with a process of learning from meagre samples of experience through experiencing multiple interpretations of those events (March et al 1991).

INSERT TABLE 2 ABOUT HERE

Investor fit is the most important criterion amongst experienced angels, second amongst novice angels but only fourth amongst nascent angels. Experienced angels clearly recognise the value of maintaining clear investment criteria and not deviating from them and by investing in businesses in markets and sectors that they know and understand. There is evidence here of both representativeness heuristic and of an anchoring heuristic in which their prior decision set puts
constraints on the nature of the opportunities they consider attractive. The other significant
deviations relate to marketing, with nascents placing more emphasis on this than either novices or
experienced angels, and the business plan, which experienced angels emphasise more than either
novices or nascents. Again this demonstrates the operation of a representativeness heuristic. There
is a higher degree of agreement amongst those factors that are of lesser importance – operations is
第九 ranked for all three investor types, and the entrepreneur is ranked seventh by both nascent
and experienced angels but fifth by novices. Although not a major difference, this suggests that
novice angels may be more likely to base at lest their initial decisions on the qualities
(trustworthiness, likeability, experience, perceived competence) of the entrepreneur (Harrison and
Mason 2002) than will more experienced investors who can draw on more robust availability and
representativeness heuristics to aid their decision-making. If so, this has implications for attempts
to deepen the pool of angel investors by bringing more nascent investors into the market.

Second, there are contrasts in the way in which the different investor types allocate their time.
Novice investors spend almost one-third of their time on their top ranked investment criterion
compared with 22.3% of their time for nascents and 20.1% of their time for experienced angels.
This difference widens further when their second top investment factor is added (53.7%, 42.9%
and 39.6% respectively) and although the gap narrows after that it remains clearly identifiable
until the fifth investment criteria. This indicates that experienced angels do not become obsessed
with just one or two investment factors. This is an important conclusion for it suggests, in contrast
to the interpretation of the factors identified as important in the decision process, that they are not
employing a representativeness heuristic, which would be reflected in their allocation of more time
to fewer factors in an overall quicker process. For these investors, the operation of an availability
heuristic and of an anchoring and adjustment heuristic, together with the accumulation of more
direct experience on which to draw (which underpins the availability heuristic), appears to
downplay the significance of the representativeness heuristic in their decision processes. In terms of their learning processes, therefore, and a subject for further research, the shift in the relative importance of these heuristics in the learning process with experience is an important topic.

There are few differences in the cognitive processes used by business angels to analyse the investment proposal, either in terms of the rank order of statement types or the absolute frequencies with which they were evidenced (Table 3). Again using Spearman’s rho, there are strong rank order relationships between the responses of super angels and novice angels (\( \rho = 0.89 \)), between super angels and nascent angels (\( \rho = 0.89 \)) and, very slightly more weakly, between novice and nascent angels (\( \rho = 0.80 \)). Inferences, questions and descriptions are the top three statement types for all three groups of angels with question and description ranked second and third for nascent angels but reversed for novice and experienced angels. In terms of their allocation of time nascent angels spend most time asking questions (26.2% cf. 15.1% and 20.1% for novice and experienced angels respectively) and least time on description (16.7% cf. 19.9% and 22.7% respectively). In all cases, and in common with previous research (Mason and Rogers 1996; 1997), recall statements are rare, suggesting that at the initial screening stage at least, there is little evidence of an anchoring and adjustment heuristic at work.

INSERT TABLE 3 ABOUT HERE

DISCUSSION

These contrasts in the verbal frequency counts amongst the three groups of angels are not as great as might be expected, with the differences limited to the time to make the decision and the emphasis given to certain investment criteria. This may suggest that the extent of learning has
been limited. However, this is not the case. In follow-up questions after completing the verbal protocols the super angels all acknowledge that they have learnt continuously.

“You are always learning … It’s been a process of personal evolution” (super 2).

“I learn from every investment I have made” (super 1).

Learning begins with the very first investment. One super angel commented as follows:

“After the first investment I thought, hang on a minute, I really need to be more diligent in the questions and actually test what people are saying to me in a more robust way” (Super 4).

The novice angels similarly also noted that they gained significant learning from their initial investment.

Instead, we attribute the relatively limited contrasts in the verbal protocol frequency to two other factors. First, the impact of much of the learning appears to be reflected in the next stage of the investment process, where angels undertake a detailed investigation of those investment proposals that pass their initial screen, rather than at the initial screening stage itself. In other words, angel investors learn progressively through the process of screening, evaluation and making an investment. Novice investors, therefore, report less learning because they have less experience to reply on. Second, it reflects the nature of the learning, which appears to be restricted, with the majority of super and novice angels noting that the underlying fundamentals (i.e. the key
investment criteria) and their investment processes have remained the same. This apparent
contradiction is explained in the following terms by one novice angel:

“I don’t think it’s so much learning but reinforcement, like people skills being really
important” (novice 1).

Another commented that investing is

“definitely a practical learning experience … [but] it doesn’t change your underlying
approach” (novice 2).

The same point is made by this angel:

“Has my approach to investing changed? Not really. I think it all comes down to the four
things I look for – people, profit, cash generation and exit. So fundamentally no it’s not
really changed … how I actually produce the question sets has changed but
fundamentally these four elements are the most important elements for me” (super 4).

And another commented:

“I think I still do what I did before … what’s at the core of this … [business] … [But] I
don’t necessarily accept all the stuff that’s all around it” (super 3).

In other words, learning appears to have primarily influenced the approach of business angels and
shaped the emphasis that they give to particular investment criteria. Heuristics, and through these
the incorporation of vicarious experience into decision rules and criteria, rather than the accumulation of experience itself therefore appear to play a significant role, and learning occurs through the processes that shape and develop the heuristics underpinning decision-making.

The types of learning cited by the angels support this interpretation. By far the most commonly cited learning (amongst six of the eight novice and super angels) concerned changes to the way in which they assess the people involved in the business. In a clear signal of the importance of learning from experience, the following comments were made by super angels:

“I was willing to believe peoples’ honesty and integrity without necessarily testing it. Something I do differently now is quiz people a hell of a lot more… I certainly do things differently now than when I made my first investment” (super 4).

“Assuming that because people are a specialist in their own field they actually know anything was part of the naivety and learning curve that I went through. I actually thought that people, if they were specialists in that area, knew what they were actually talking about. And that isn’t necessarily the case” (super 4).

“On the assume nothing principle, I am much more careful about understanding what the words in a plan mean and what the writers of the plan mean. When I meet entrepreneurs I am much more interested in their definitions and checking out what they mean” (super 3).

This throws additional light on some of the earlier results of the verbal protocol analysis (see Table 2 above), where it was clear that references to the entrepreneur were only ranked seventh (out of nine) by these investors, and implies that the nature of the learning process shows up in an
enhanced application of a representativeness heuristic. The nature of the means by which these heuristics change as part of the learning process itself remains an important area for further research. In particular, it points to the role of associative learning (Mitchell, De Houwer and Lovibond 2009) in the investment process, as investors build up through experience as association between certain characteristics (in this case, entrepreneur-related) and particular outcomes. Interestingly, novice angels made similar observations.

“I am learning that we are backing people … so I would be much more critical. I would go into much greater detail on the capability of the people and I would try to get more involved” (novice 3)

“I would hope to concentrate more on people than spread sheets” (novice 2)

“What I am now looking at is the people – who are the people, what are their skills what is their background is what I am looking at to give me a sense of comfort. Do the people really know what they are talking about?” (novice 1)

The other area of learning that several angels identified was associated with the need to focus and discriminate and thereby make quicker decisions.

“When I first started looking at propositions …. Everything that came my way I’d spend time looking at it. I might spend time subsequently meeting with the individuals. There is a hell of a lot of stuff I did in those days that now wouldn’t get past the first couple of pages … So there has got to be something that jumps out in the proposition” (super 2).
“I feel far more confident about making quick decisions about investments … [With greater experience] you can very quickly decide to go to the next stage and want to meet these people or don’t want to meet them … So it won’t take me three or four months to make up my mind if I am going to invest or not.” (novice 1)

Finally, two angels said that they now rely more on their instinct and gut feeling.

“When I first started I was always looking for the good points in a proposition. Now I follow my hunch, my gut feeling and disregard more” (super 2).

“I make my investments predominantly on a sixth sense” (super 4).

In all cases, even though our analysis has been restricted to the initial screening stage of the decision process and we have no evidence on changes in outcome, there is evidence in these reflections on the change of approach to investment screening by these investors. This suggests that learning is associated with changes in mindsets as well as behaviours and actions.

There is also evidence that vicarious learning plays an important role in the learning process for these investors. Several of the angels identified other investors as a key source of their learning. One novice angel noted that

“you get involved in more syndicates, looking at attending meetings and just picking up from different people when you go to these meetings in terms of what they are looking at … [and] … you get to the stage where you have people that you respect and take opinion from who you listen to their views who are far more experienced than me” (Novice 1).
This view is consistent with the reliance on experiencing history more richly through exposure to multiple aspects and multiple interpretations of it as a social as well as individual process. A super angel who was quoted earlier saying that “you are always learning” went on to highlight the importance of

“one particular individual that I met about a year and a half ago. He and I have various involvements together so we use each other as a sounding board … Initially I was looking at projects in relative isolation and making decisions myself. Now I bring in someone else for a second opinion. So if I look at a proposition and think it is good I bring in another person to rip the proposition apart for me to see if I have missed anything. So that is how I operate now but it’s not how I operated 18 months or two years ago.” (super 2).

Learning was also precipitated by a ‘learning event’ (Cope, 2003), with a recurring theme being learning from failed investments. As a number of commentators have pointed out, failure, the termination of an initiative – in this case an investment – that has fallen short of its goals – in this case a successful exit – is an opportunity to learn (McGrath 1999; Sitkin 1992; Corbett, Neck ands DeTienne 2007). However, there are a number of cognitive biases that limit the ability to learn from failure. Among these are perceptions of personal responsibility (or non-responsibility), attribution bias, self-efficacy bias, championing and advocacy effects (Corbett et al 2007, 832). From a learning perspective, these cognitive biases may vary with the experience levels of the investors. For example, one super angel commented as follows:
“We had one investment go down, all because the founder was not right. All through the process we were making excuses for him. I am now very aware of not making excuses for people now. It was a harsh lesson that we needed to learn and it has made us better investors as a result” (super 3).

Another super angel investor now invests smaller amounts across a larger number of businesses as a result of a previous failed investment in a clear demonstration of the manner in which learning from experience changes behaviour. Nascent angels, on the other hand, fell into two groups. Some demonstrated clear evidence of the role of cognitive biases in attenuating the learning process. Specifically, two nascents were confident – arguably over-confident - that the knowledge that they had derived from their professional career meant that there was little if anything that they needed to learn. One commented that

“I think I know enough to be able to make informed judgements on businesses as I have spent a whole career doing it” (Nascent 1).

The other commented in similar vein:

“I led a management buyout in 2001 and I’m pretty conditioned to reviewing investment proposals because for years I’ve done due diligence on investments and I have actively been involved in my professional life in various strategic initiatives such as acquisitions, disposals and so on. So the thought process is something I am used to conversing with” (nascent 3).
In contrast, the two other nascent angels recognised their need to learn, and indicated that they
were looking to learn from existing investors, reemphasising the importance of vicarious learning
(learning from the experience of others) in situations where one’s own experience is meagre or
absent. One commented that

“I could produce a due diligence document and go through all the questions that would
satisfy but I’m quite sure an experienced angel would look for other things” (nascent 4).

The other – a former banker – recognised that his banking background did not give him the full
toolkit to become an angel investor. He willingly acknowledged that “there is a lot I don’t know.
Unconscious incompetence probably sums it up” (nascent 2), adding that he was coming to angel
investing “very much with a banker’s head on.” This raises the possibility that nascent angels may
have to unlearn some of their previous experience before they can start to learn how to be an
effective investor. In other words, there is a recognition among some at least of these investors that
they do need to systematically and explicitly address the anchoring heuristics that have used and
develop adjustment heuristics based on more than incremental change in the anchor points.

CONCLUSION

This paper has sought to extend the literature on how business angels make their investment
decision by exploring the effect that experience has on their approach. Given the weaknesses of
retrospective analyses of decision-making our approach was based on a real time methodology,
verbal protocol analysis, which involved asking three groups of angels, differentiated by their
investment experience, to review an investment opportunity. The three groups were compared in
terms of speed of decision, investment criteria and cognitive processes. Super angels – the most experienced - were quickest to make their decision and their review gave greater emphasis to ‘investor fit’ than either the novice or the nascent angels. These angels, in contrast, gave more emphasis than super angels to financial issues. The only difference of note in the cognitive processes was that nascent angels spent more time than either novice or super angels in asking (rhetorical) questions as they read the proposal.

Both the super and novice angels recognised that they have learnt continuously from their investment experience. There is evidence of both experiential learning (individual) and of vicarious learning from the experience of others. There is also some evidence of the importance of heuristics in both the decision making process and in respect of the nature of the learning process itself. Investors in our sample do show a reliance on memories of past events (an availability heuristic) in making decisions, and show a tendency to identify the most significant feature of a category of events (a representativeness heuristic) and apply it rather than an exhaustive set of features. However, somewhat counter-intuitively, this was less pronounced for the more experienced angels in our sample, and this remains an important area for further research.

Although our focus on the initial screening stage precluded extensive discussion of anchoring and adjustment heuristics, there was some evidence to suggest that novice angels in particular anchored their judgements more frequently in their prior experience. For them, this reinforces a weak availability heuristic ands may be associated with poorer quality investment decisions. Again, this represents an important area for further research.

However, it is also clear from this analysis that the learning has been in terms of their approach to investing rather than their fundamental investment philosophy. Moreover, this learning has had more effect on how they conduct their due diligence on opportunities that pass their initial
screening rather than on the initial screening stage itself, with the key learning based around the way in which they assess the people involved in the business. Some have also learnt how to discriminate more effectively and hence make quicker decisions. Investing with other, more experienced, angels has been a significant source of learning for the majority of novice and nascent angels. Failed investments have also been a significant source of learning. The attitudes of some of the nascent entrepreneurs, on the other hand, seemed complacent, believing that they could rely on knowledge that they had accumulated in their professional career, pointing to both the existence of substantive cognitive biases and to the potentially negative impact on learning of inappropriate anchoring heuristics accompanied by a bias-limited adjustment heuristic.

Finally, the paper confirms the importance of the social dimension of learning for several of the business angels. These angels note that learning from other, more experienced angels, both members of the same investment syndicate and investment partners, have been a significant source of learning. Much of the entrepreneurial learning literature is based on a view of learning as an individual process of learning from experience. However, the evidence from this exploratory research into learning in the angel investment decision-making process points to the importance of vicarious learning from the experience of others, to compensate for the difficulties of learning from experience when there has been no experience to learn from, and to the role of heuristics as a means of processing and reducing that experience into a more limited set of decision criteria.

Three consequences follow from this analysis. First, there is a need for further more detailed exploration of the issues raised in this paper, and in particular of the role of heuristics in angel decision making, across a wider sample of investors in a broader range of stages in the decision process and in a more diverse set of investment settings (including group and syndicate investment situations). Second, there is a specific need to explore more extensively the nature of the
entrepreneurial leaning process in a social as well as individual context, recognising that the
generation of knowledge, including tacit and affective as well as cognitive knowledge, is a social
process (Burgoyne 1995). Third, based on this new understanding of the angel learning process,
and in view of the importance attached to simulating experiences through the generation of
hypothetical histories (March et al 1991), approaches to angel education (e.g. through angel
academies – San José et al, 2005) could usefully be recast to emphasise the reliability of learning
through the construction and sharing of belief (the development of appropriate heuristics) and the
validity of learning through the construction of causal belief (the association of initial factors and
outcomes, the what happened, why it happened and how we should learn from it questions). In so
doing, it will be possible to accelerate the speed with which individual angels, of some experience
or none, can ‘extract meaning from sample sizes of one or fewer’ (March et al 1991, 15).
REFERENCES


### Table 1. Decision And Length Of Time To Make Decision

<table>
<thead>
<tr>
<th></th>
<th>Super Angels</th>
<th>Novice Angels</th>
<th>Nascent Angels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision</td>
<td>x x x √</td>
<td>x x x √</td>
<td>x √ x x</td>
</tr>
<tr>
<td>Time Taken</td>
<td>11m 5m 6m 6m</td>
<td>20m 5m 6m 11m</td>
<td>6m 14m 9m 3m</td>
</tr>
<tr>
<td></td>
<td>50s 30s 25s 30s</td>
<td>53s 20s 30s 15s</td>
<td>55s 25s 40s 55s</td>
</tr>
<tr>
<td>Average Time</td>
<td>7m 34s (Median 6m 28s)</td>
<td>10m 59s (Median 8m 53s)</td>
<td>8m 44s (Median 8m 18s)</td>
</tr>
</tbody>
</table>

Key: x = reject : √ = consider in more detail
Table 2. Verbal Protocol Frequency Counts by Funding Criterion

<table>
<thead>
<tr>
<th>Funding Criterion</th>
<th>Super Business Angel</th>
<th>Novice Business Angel</th>
<th>Nascent Business Angel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor Fit</td>
<td>20.1 (1)</td>
<td>20.6 (2)</td>
<td>8.8 (4)</td>
</tr>
<tr>
<td>Product</td>
<td>19.5 (2)</td>
<td>18 (3)</td>
<td>21.4 (2)</td>
</tr>
<tr>
<td>Business Plan</td>
<td>17.2 (3)</td>
<td>14.9 (4)</td>
<td>6.5 (6)</td>
</tr>
<tr>
<td>Finance</td>
<td>14 (4)</td>
<td>22.3 (1)</td>
<td>32.3 (1)</td>
</tr>
<tr>
<td>Market</td>
<td>12.7 (5)</td>
<td>7.2 (6)</td>
<td>15.3 (3)</td>
</tr>
<tr>
<td>Strategy</td>
<td>2.6 (6)</td>
<td>5.3 (7)</td>
<td>6.5 (5)</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>11 (7)</td>
<td>8.7 (5)</td>
<td>4.4 (7)</td>
</tr>
<tr>
<td>Other</td>
<td>1.9 (8)</td>
<td>2.9 (8)</td>
<td>4.4 (7)</td>
</tr>
<tr>
<td>Operations</td>
<td>1 (9)</td>
<td>0 (9)</td>
<td>0.3 (9)</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes: Percentages do not add up to 100 because of rounding

Spearman’s Rho rank order correlation:
- Super – Novice \( \rho = 0.85 \)
- Novice – Nascent \( \rho = 0.74 \)
- Super – Nascent \( \rho = 0.71 \)
Table 3. Verbal Protocol Frequency Counts by Statement Type

<table>
<thead>
<tr>
<th>Statement Type</th>
<th>% of thought units by type - averaged by type of Business Angel</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Super Business Angel</td>
<td>Novice Business Angel</td>
</tr>
<tr>
<td>Inference</td>
<td>37.7 (1)</td>
<td>38.1 (1)</td>
</tr>
<tr>
<td>Description</td>
<td>22.7 (2)</td>
<td>19.9 (2)</td>
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<tr>
<td>Question</td>
<td>20.1 (3)</td>
<td>15.1 (3)</td>
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<tr>
<td>Comment</td>
<td>7.5 (4)</td>
<td>10.3 (4)</td>
</tr>
<tr>
<td>Preconception</td>
<td>5.2 (5)</td>
<td>6.3 (6)</td>
</tr>
<tr>
<td>Recall</td>
<td>3.6 (6)</td>
<td>1.8 (7)</td>
</tr>
<tr>
<td>Action</td>
<td>3.2 (7)</td>
<td>8.5 (5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Notes: Percentages do not add up to 100 because of rounding

Spearman’s Rho rank order correlation:
- Super – Novice $\rho = 0.89$
- Novice – Nascent $\rho = 0.80$
- Super – Nascent $\rho = 0.89$