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# **The decision to innovate**

**Literature and propositions**

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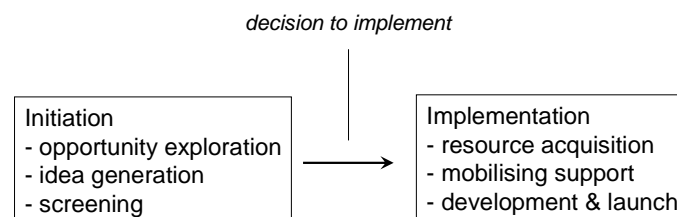
# 1 Introduction

## 1.1 Motivation

The successful business of the future is believed to be one that continuously innovates, i.e. is able to demonstrate flexibility and to pro-actively anticipate business opportunities. On the waves of a plethora of innovation and entrepreneurship studies, the past fifteen years have witnessed increased attention for the innovative efforts of individuals. Research into individual innovation endorses the view that organizations should develop and use the innovative potential of their employees as a means to foster organizational success (e.g. Van de Ven, 1986; Amabile, 1988; Axtell *et al.* 2000; Unsworth & Parker, 2003). Similarly, the related field of entrepreneurship research centres around the individual that explores and discovers opportunities, decides to exploit them, and implements them through a process of resource acquisition and organization (e.g. Shane, 2003).

This study focuses explicitly on individuals' decisions to innovate. One drawback in innovation research is that, at the level of individuals, not much attention is paid to what determines whether innovative ideas are implemented. This is clearly apparent in the widely recognised stage model of the innovation process (see figure 1, derived from Zaltman *et al.* 1973).

figure 1 Stage model of innovation



The stage model breaks down the innovation process into a number of activities. In its most simple form it distinguishes just two phases: initiation and implementation. Initiation is a divergent phase, including activities such as the recognition of problems and thinking about ways to improve things. The initiation phase results in innovative ideas e.g. an idea for a new product, service or work process. Implementation is a convergent phase; it is directed towards the development and launch of the actual innovation so that its benefits can be acquired. The dividing line between the two phases is the point of the first adoption of the innovation; i.e. the point at which the decision to implement the innovation is made (King & Anderson, 2002).

Although it has repeatedly been stressed that innovation also includes decision-making, this subject remains basically uncovered in innovation studies at the individual level. In a review of creativity literature for instance, a subject that covers an important part of the research domain of individual innovation, Mumford (2003) recommends that future work should also investigate 'late cycle skills', i.e. behaviours directed to the realization of creative ideas, starting with the critical moment of deciding whether and how to implement.

In this paper we investigate what influences an individual's decision to proceed with an innovative idea once the idea has been recognised. We make an inventory of factors that previous studies suggested to be antecedents of this decision to innovate. For this purpose we also studied the literature on entrepreneurial decision-making. No doubt both fields overlap as they cover similar issues. Both disciplines, for example, cover the generation of ideas: in innovation studies creativity is a key topic (e.g. Zhou & Shalley, 2003) while entrepreneurship studies investigate opportunity exploration by self-employed people (e.g. Krueger, 2000). However, entrepreneurship literature also pays attention to factors that remained uncovered in most innovation studies. For example, it focuses explicitly on what happens in the extra-organisational environment (market and demand features). It also pays greater attention to personal traits that affect whether ideas are implemented (Shane, 2003). On the contrary, however, entrepreneurship literature has two important drawbacks. First, it focuses almost exclusively on start-up firms, implying that the decision to exploit an idea is operationalised by fairly simple counts of new ventures. The moment at which established entrepreneurs decide to innovate has been overlooked and is an important area for future research (Shane, 2003: p. 264). Second, entrepreneurship studies barely investigate employees in established firms ('intrapreneurship'). So we conclude that, like innovation literature, entrepreneurship theory can benefit from an exploration of the antecedents of the decision to innovate.

## 1.2 Objective

### *Main question*

The main question in this research is: *What makes individuals (entrepreneurs, employees in organisations) decide to proceed with innovative idea?*

We intend to address this question from two angles: the solitary, established entrepreneur and the employee within an established organisation. The subject is also relevant for practitioners. As knowledge nowadays becomes the most important production factor in modern countries and ever more businesses exist because of their knowledge-intensity (Hislop, 2005), organisations increasingly depend on the innovative potential of their staff, including supervisors (the entrepreneur or manager) and subordinates (employees). Policy makers may also benefit from a theoretical framework of the decision to innovate. Ever since the EU's Lisbon conference in 2000, national governments within the European Union have embraced the idea of stimulating innovation in businesses. Individuals who decide to proceed with innovative ideas are needed at the core of innovative investment realisation. Awareness of the factors that may trigger their decision can eventually help to formulate better policy measures.

### *Methodology*

We combined insights from innovation and entrepreneurship literature to examine the antecedents of the decision to innovate. Despite their use of similar concepts each of these types of literature tends to systematically ignore the other's work. By drawing on this literature a conceptual model and propositions have been developed concerning the connection between various key arguments, personal-, team-, task- and organisational factors and the decision to innovate. As both types of literature have a much broader scope than just the decision to innovate, large parts of what we could possibly report are irrelevant in the light of our research question. This report gives an overview of our findings.

### 1.3 Outline

Chapter 2 starts by defining innovation and briefly introduces how individuals' innovative ideas are born. We next turn to our main goal of clarifying what factors influence individuals' decisions to innovate. Three main arguments are presented that determine whether an individual proceeds with an innovative idea or not: perceived pay-off, situation control and intrinsic motivation. We also develop propositions on the interaction between these three arguments. The chapter ends with a discussion of how the decision to innovate may be measured in practice; this section provides a basis for future empirical investigations.

Chapter 3 discusses a range of factors that may influence how individuals perceive innovative ideas (*i.e.* how they assess the arguments of perceived pay-off, situation control and intrinsic motivation) and which we propose influence their decision to innovate. These factors are classified in seven groups: idea features, personal traits, cognitive ability, resources, task features, team- and organisation factors and environmental factors. Their relevance to entrepreneurs and employees within organisations is discussed. As the literature provides a plethora of potential antecedents, our overview cannot be regarded as exhaustive. Rather it illustrates that, at the individual level, the field of antecedents of idea implementation is broad and provides many options for future work.

Chapter 4 ends with our conclusions and a brief discussion of the limitations of this study. In the coming period we plan to test our model and its propositions in an empirical survey.





## 2 The decision to innovate

### 2.1 Innovation

Before we discuss what influences the decision to innovate, it is necessary to define innovation and to describe when the decision to proceed becomes relevant. Trying to explain the decision to innovate without this explanation would run the risk of introducing ambiguity and misunderstanding.

Schumpeter (1934) is considered to be among the first to recognise the process of innovation and its impact on economic development. He described innovation as the creation and implementation of 'new combinations'. These new combinations can be related to new products, services, work processes and markets. Innovation has been defined many times since Schumpeter. Authors generally emphasize the element of newness, including anything perceived to be new by the people doing it, or as something different for the organisation into which it is introduced. In addition to an innovation apparently being 'something new', definitions have other aspects in common. King and Anderson (2002: p. 2-3) define innovation as

- Something new to the social setting within which it is introduced, although not necessarily new to the person(s) introducing it
- Based on an idea
- Aimed at producing some kind of benefit
- Intentional rather than accidental
- Not a routine change
- Public in its effects.

This definition builds on West and Farr's (1990) frequently cited definition of innovation. An innovation is considered as something new to a social setting (e.g. individual, group, firm, industry, wider society) although not necessarily new to the person(s) introducing it. An idea is a necessary condition for an innovation. It is the starting point, but it cannot be called an innovation in itself. An innovation is aimed at producing some kind of benefit. Apart from financial gains, possible benefits might be personal growth, increased satisfaction, improved cohesiveness or better interpersonal communication. The definition also includes the creation of new ideas to benefit not only the role, group or organisation but society as a whole.

Innovation is restricted to intentional attempts to derive anticipated benefits from change. When a firm's employees are unable to use e-mail and then discover that their sales results have improved thanks to intense telephone contact with customers, this would not be an innovative action. If, however, the firm deliberately takes the same action in order to improve customer relations, one could regard it as innovative. Innovation involves an application component; merely having a creative idea is not enough. This implicitly underlines the importance of our research here: what makes an individual decide to proceed with an innovative idea?

### 2.2 Sources and identification of ideas

The decision to innovate can be made only after an innovative idea has been identified or, in terms of entrepreneurship literature, an opportunity is recognised and a potential solution has been identified.

Innovation usually starts with the detection of a 'performance gap' a mis-match between actual and potential performance. Innovation literature stresses that the realisation of something new begins with a person identifying new opportunities (e.g. Parnes et al.1977: Basadur 2004, Amabile,1988). The start of an innovative process is often determined by chance: the discovery of an opportunity, a problem arises or perhaps even a puzzle that needs to be solved. The trigger to identify opportunities may be a chance to improve conditions or a threat requiring an immediate response. Some opportunities for innovations may be easy to identify but others can remain overlooked for a long time. In 1845 when Sir John Franklin took one of the new-fangled 'tin cans' of veal to the Arctic he had to make sure he had a hammer and chisel at hand to open it. It was only in 1885 that the first can opener was introduced (Petroski, 1992). Sources of opportunity, as defined by Drucker (1985), relate to the factors that can initiate innovations. He identified seven sources of opportunities:

- The unexpected (unexpected successes, failures or external events)
- Incongruities (gaps between 'what is' and 'what should be')
- Process needs (in reaction to identified problems or causes of failure)
- Changes in industrial- and/or market structures (changes in contemporary markets like rapid growth, re-segmentation, convergence of separate technologies, etc.)
- Demographics (changes in population features like birth rates, educational attainment, labour force composition)
- Changes in perception and
- New knowledge (scientific, technical or social knowledge, or combinations of the three).

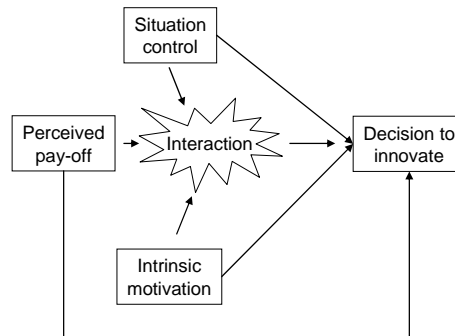
The discovery of opportunities is one thing; ability to construct new ways to address them is a second. Innovation literature stresses idea generation as a necessary condition for innovation (e.g. Kanter, 1988; Van de Ven, 1986; Amabile, 1988). Key to idea generation appears to be the combination and reorganisation of information and existing concepts to solve problems and/or to improve performance. Rothenberg (1996), in his study of Nobel laureates, found that these new combinations often provide a basis for advances in science. Along similar lines, Mumford *et al.* (1997) found that skill in combining and reorganising concepts is one of the best predictors of creative achievement. Kanter (1988) speaks of 'kaleidoscopic thinking'. In a kaleidoscope a set of fragments form a pattern. But the pattern is not locked into place. If the kaleidoscope is shaken or twisted, or the angle of the perspective is changed, the same fragments form an entirely new pattern. It is an apt metaphor for the generation of ideas to satisfy opportunities, because the kaleidoscope allows people to shake reality into a new pattern. Idea generation often consists of re-arranging already existing pieces to create a new possibility. In general, then, the best idea generators are those individuals who can approach problems or performance gaps from a different angle.

### 2.3 Arguments for the decision to innovate

In this paper we assume that an opportunity has been discovered and an idea has been generated to address it. Either an entrepreneur or an employee within an organisation may have identified the innovative idea. From the individual innovation and entrepreneurship literature we have identified three theoretical arguments that are often used to explain why individuals decide to proceed with idea implementation: 1. perceived pay-off, 2. situation control and 3. intrinsic motivation. It is striking that these arguments are always used in isolation. We claim that each of them can be expected to

stimulate idea implementation, but the decision to innovate will be most stimulated when all three arguments are satisfied. This is visualised in figure 2.

figure 2 Arguments for the decision to innovate



### *Perceived pay-off*

For many years scholars have investigated decision-making in a variety of contexts. A dominant stream of research in decision-making is the (bounded) rationality perspective. In this perspective it is usually one single authoritarian individual who takes decisions (Schoemaker, 1993). It is argued that decision-making is a rational purposive process, in which individuals know exactly what they want because they have carefully collected information, developed alternatives and selected the best alternative possible to fully maximize their utility (March & Simon, 1958; Allison, 1971). However, individuals have cognitive limitations and cannot oversee all the consequences of their choices, implying that 'people intend to act rationally, but do so only limitedly' (Simon, 1957: xxiv).'

The rationality perspective has been applied in many fields of research. Entrepreneurship literature, for example, uses a rationality perspective to explain why some individuals decide to exploit identified opportunities and others do not. Entrepreneurship literature postulates that to pursue uncertain opportunities, individuals must perceive some kind of pay-off, *i.e.* believe that they will gain more than they are giving up. When people make a decision to exploit an opportunity, they do so because they believe that the expected value of exploitation (both monetary and psychic) will exceed the opportunity cost for the alternative use of their time plus the premiums that they would like for the uncertainty (Venkataraman, 1997).

Innovation literature has also proposed rationality perspectives in order to explain why innovations are implemented. Farr and Ford (1990) take a bounded rationality perspective by assuming that the likelihood of an individual being innovative depends on the perceived pay-off achieved through change. Even if a person senses a need to innovate and has generated an idea to solve this need, implementation is unlikely to occur if it is felt that the pay-off from such behaviour is low. Farr and Ford (1990) propose that individuals must see a 'reasonable' set of positive outcomes from a possible innovation before they will attempt to carry out this change. Outcomes that may be valued positively by individuals can go beyond the relief of solving a problem. Perceived pay-off is determined by monetary rewards, organisational advancements, formal and informal recognition by others, beliefs about self-worth and achievement, greater job security, the reduction or avoidance of boredom, etc.

### *Situation control*

The argument of situation control was proposed by Gebert (1987) and colleagues to explore the psychological mechanisms underlying an individual's decision to innovate. The argument is derived from Lazarus's (1966) cognitive stress-coping theory and this theory has been applied to a wide variety of contexts, including innovation. A basic assumption of the situation control argument that is shared with many other innovation theories is that a performance gap must be perceived before even starting to think about innovation. Once a need for change has been recognized, an individual may perceive this situation as a threat or as a challenge (cf. Lazarus, 1966). Divergence between a desired state and an actual state determines the scope of the situational change that is judged to be needed, and the extent to which a need for idea implementation is perceived (Gebert *et al*, 2003).

Provided that a performance gap is perceived, the individual engages in an appraisal of situation control. Whereas the primary appraisal relates to the current situation, this secondary appraisal focuses on the analysis of coping strategies, that is, the ability to deal with the situation. Two considerations are essential here (Gebert, 1987: p. 944). First, the individual judges whether he or she personally possesses the necessary resources (e.g. authority to act, decision-making competence, autonomy, time, budget, staff, knowledge) to cope with the situation. If insufficient control is perceived, the individual assesses the likelihood of reducing the discrepancy between the desired and actual state by procuring resources elsewhere, such as from a superior or supplier.

Situation control determines whether an individual perceives a situation that is susceptible to change. Where there is sufficient situation control the implementation of an idea becomes probable (Krause, 2004). When insufficient situation control is perceived, innovation-blocking behaviours will be likely, including flight (leaving job, absenteeism, etc) and intra-psychic coping (e.g. repression, denial, rationalisation) (Lazarus, 1966; Krause, 2004).

### *Intrinsic motivation*

The intrinsic motivation argument is derived from Amabile's (1983; 1988; 1996) componential theory of creativity in the workplace. Creativity is an aspect of innovation that actually precedes the decision to innovate. It deals with when and how ideas are born rather than if they are implemented (Amabile, 1988). The argument of intrinsic motivation has, however, been applied to other contexts where individuals make decisions to act. Intrinsically motivated persons are for instance more likely to donate their blood for medical applications and pick up their children from kindergartens without being too late (Frey & Jegen, 2001). This argument can be applied to the decision to innovate as well.

Amabile's theory posits that there are three key components of creative performance: domain-relevant skills, creativity-relevant processes, and task motivation. Domain-relevant skills refer to an individual's factual knowledge and expertise in a given domain. Creativity-relevant processes are about explicit or tacit knowledge concerning how to produce creative ideas. Both components are personal characteristics and hard to change in the short run. The third component, task motivation, has become the most-often used theoretical argument in individual innovation research. An individual's motivation can be intrinsic or extrinsic in nature. Intrinsic motivation is defined as 'any motivation that arises from the individual's positive reaction to a task itself; this reaction can be experienced as interest, involvement, curiosity, satisfaction, or positive challenge' (Amabile, 1996: p. 115). On the other hand, extrinsic motivation is defined as 'any mo-

tivation that arises from sources outside of the task' Amabile promises that people will be most creative when they are intrinsically motivated. Intrinsic motivation can be undermined by extrinsic factors that make people feel externally controlled in their work (Amabile, 1988, Fray G Jegen, 2001)

Although invented as an aspect of creativity, we have reason to expect a positive connection between intrinsic motivation and the decision to innovate. There are clear cognitive limits to the rational model, as decision makers satisfy rather than optimise and rarely engage in comprehensive information searches (Jones 2004). Current theory suggests there are other arguments, and we propose that intrinsic motivation is among them. The more an idea is accompanied by a task and/or outcome that an individual finds intrinsically motivating, the more he/she is likely to decide to implement the idea. If one truly enjoys working on the implementation of the idea, or the new situation that the innovation is expected to achieve, a positive decision becomes more likely. On the contrary, when individuals perceive that an idea is feasible only to satisfy outside sources (e.g. new legislation) their motivation to implement becomes extrinsically driven and will be less persuasive.

### *Interactions*

It is striking that previous innovation and entrepreneurship studies have explored the arguments discussed above in isolation. Of the few who attempted an integrative approach, the early qualitative study by Mintzberg and colleagues (1976) tried to combine various arguments to explain how innovative decisions are made. According to Mintzberg *et al.* (1976) the 'moment of action' is determined by the cumulative amplitude of stimuli, including the influence of the idea source, the interest of the decision maker in it, the perceived payoff, the uncertainty associated with the implementation, and the perceived probability of the successful termination of the decision (p. 253). The arguments of perceived pay-off and situation control are easily recognised in this discussion.

We here continue previous work by proposing that each of the arguments can stimulate the decision to innovate, but we also propose that there is a bonus if the three arguments are satisfied simultaneously. Thus, we expect perceived pay-off, situation control and intrinsic motivation to cumulate into a three-componential model of an individual's decision to innovate. In order to proceed with an innovative idea, the individual needs to perceive a pay-off from it, be aware of sufficient situation control and be intrinsically motivated for the tasks and/or outcomes that the idea will induce. In popular terms: individuals need to be willing, able and expect a benefit. Future empirical work should measure and confront the three arguments, test if they are directly connected with the decision to innovate and explore the two- and three-way interaction effects between perceived pay-off, situation control and intrinsic motivation.

## **2.4 Measurement**

Having proposed the main arguments that make individuals proceed to innovative ideas, we now ask ourselves how the decision to innovate can be measured. This is important for future empirical exercises.

The problem of measurement is complicated by the fact that most decisions to innovate are not taken at a single, discretionary point in time. Entrepreneurship literature demonstrates that when an individual has decided to proceed, the feasibility of an idea will

be further validated. In most cases an informal decision precedes the formal decision. Only after the formal decision has been made do individuals broadly communicate their intentions (Gibcus & Van Hoesel, 2003; Gibcus & Van Hoesel, 2004). A counterpart for this finding is also found in innovation literature, as innovation process models usually mention the screening of ideas as a relevant activity, implying that innovative ideas are first reviewed and assessed as to their feasibility (e.g. Zaltman et al. 1973; King & Anderson, 2002). After a first positive decision has been taken individuals usually collect additional information and can possibly decide whether to terminate, to change course, or to go ahead (Mintzberg et al, 1976). Therefore we cannot assume one single decision point. This makes it extremely difficult to trace what happens to ideas once they have been identified.

A direct measure of the decision to innovate would be to track individuals with innovative ideas and monitor them to see to what extent they put effort into these ideas. Alternatives include behaviour- and output-based measures. We now elaborate on these measurement options<sup>1</sup>.

#### *Direct measurement*

The most direct way to measure the decision to innovate would be to perform an initial survey among a sample of individuals to ask whether they currently dispose of innovative ideas they have not decided about yet. Then, in a follow-up study the individual could be asked whether he/she has actually taken action to implement the innovative idea (rejection, inspiration for other ideas, or implementation). A comparison of those who adopted and discarded their ideas would highlight significant differences between various proposed antecedents to be further specified, possibly including our proposed arguments of perceived payoff, situation control and intrinsic motivation.

From a methodological point of view this approach is effective, but it is also expensive and time-consuming. Given the lack of one single decisive moment and the fact that ideas evolve, this option would be feasible only in longitudinal designs. Besides, recording innovative ideas requires the in-depth questioning of large groups of persons. Many 'dead-weight' interviews are likely because not every individual will have an innovative idea or be able to reconstruct it at the time of the survey. In addition, follow-up surveys create an extra source of non-response, resulting in low overall response rates.

#### *Behaviour-based measures*

Innovation literature offers alternative measures, including the option to look at what individuals do. Innovative work behaviour (IWB) is a concept that has been introduced to investigate employees' innovative behaviour. IWB is a voluntary behaviour i.e. willingness to be innovative in one's job beyond what is formally required. It includes implementation-oriented behaviours like coalition building and idea implementation (Kanter, 1988; Scott & Bruce, 1994; Janssen, 2000). Whenever individuals display such behaviours this indicates they decided to proceed with innovative ideas.

<sup>1</sup> In case of laboratory experiments other measures would be feasible. We do not discuss these here.

Coalition building is often needed to implement innovative ideas. It relates to the acquisition of power by selling an idea to potential allies (Kanter, 1988). Although most innovative ideas have some legitimacy and appear to fill a performance gap, resistance to change is likely. The prospective users of the innovation (colleagues, leaders, customers, etc) may feel uncertain about what the outcome will be. They tend to focus on how an idea will affect them or their functioning. There is also a general tendency for people to perceive information selectively, *i.e.* consistent with their existing views, implying that extremely creative ideas tend to receive no priority. Finally, habit is an impediment to the implementation of ideas. People have a built-in tendency to return to their original behaviour, a tendency that sabotages change (Jones, 2004). Coalition building can be regarded as a first indication that an individual has decided to innovate and is willing to put effort in it. Examples of relevant behaviours include persuading and influencing other employees and leaders or, in the case of entrepreneurs, communicating and selling an idea to potential customers and sources of finance (*e.g.* Kanter, 1988; Howell & Higgins, 1990; Van der Ven, 1986).

One type of behaviour related to coalition building is championing. A champion is someone who emerges to put effort into ideas (which he may not have generated himself) and bring them to life (Shane, 1994). The innovative individual who takes prime responsibility for the introduction of innovations is often not formally appointed, but rather someone with a strong personal commitment to a particular idea and someone who is able to 'sell' it to others (Kanter, 1988).

As another alternative to coalition building the decision to innovate can also be indicated by the construct of idea communication. As a first step towards implementation, an individual might communicate the idea to others (*e.g.* peer colleagues, potential customers, sources of finance) for feedback and to build support. If someone communicates his ideas, this is an indication that he is willing to proceed with the idea.

Idea implementation is related to the actual transformation of an idea into some concrete output. It consists of behaviours like development, testing and introducing the innovation. The outcome may be a prototype of a new product or service, new work processes or procedures for the execution of work. An individual should put considerable effort into 'making the idea happen'. Idea implementation deals with making ideas a regular part of working processes (*e.g.* Van der Ven, 1986; Kanter, 1988).

Behaviour-based measures like coalition building, idea communication and idea implementation are typically collected in field studies using multiple-item scales. They could be self-rated by individuals, but as a better alternative, peer ratings are obtained from supervisors (in case where the focus is on employees) or subordinates (in case of entrepreneurs) (Zhou & Shalley, 2003).

#### *Output-based measures*

Another alternative would be to take an output-based perspective. Entrepreneurship researchers for example tend to solve the problem of measurement rather pragmatically: the decision to exploit an opportunity is put on a par with starting a new business. By far most entrepreneurship studies focus on start-up firms where simple counts of new ventures within a particular time frame and/or type of industry serve as a dependent variable (Shane, 2003). This approach is clearly unsuitable when one is dealing with established entrepreneurs or individuals within organisations, but still the thought of using the outputs of the innovation process as an indirect measure for one's decision to innovate may be feasible.

Innovative outputs may be expected as a consequence of the decision to proceed, Scott and Bruce (1994), for example, reported significant correlations between individuals' innovative work behaviours and their independently rated counts of invention disclosures. Innovative output is usually assessed by drawing on objective sources of information, such as patent counts, technical reports, innovation awards and invention disclosures (e.g. Scott & Bruce, 1994; Tierney, Farmer & Graen, 1999). Such measures can be available particularly when individuals are occupied in innovative professions (e.g. R&D workers, artists and scientists). One drawback of objective measures is their unavailability for those in other professions. In sectors like retail trade, agriculture, wholesale trade, construction and personal services, objective output measures are hard to obtain.

Recent empirical studies have therefore used self-ratings of innovative output, for example, individuals can respond to questions about the extent and scope of innovations they contributed to in their work. West and Hirst (2003) and West and Anderson (1996) measured the output of innovation processes by means of the number of innovations and their quality. What qualifies as an innovation, and the quality of an innovation are subjective judgments, even though sometimes great efforts are made to achieve as much agreement between judges as possible concerning the extent to which individuals perceive the quality of innovation. Others, for instance Tjosvold *et al.* (2004), took a more simple approach by using rating scales for innovativeness that were filled in only by managers. Another example includes Axtell *et al.*'s (2000) self-ratings on suggestions and implementations related to new products and services, work practices, knowledge and markets (groups of customers). Differences in these self-ratings of innovative output indicate that individuals differ in their decision to innovate.

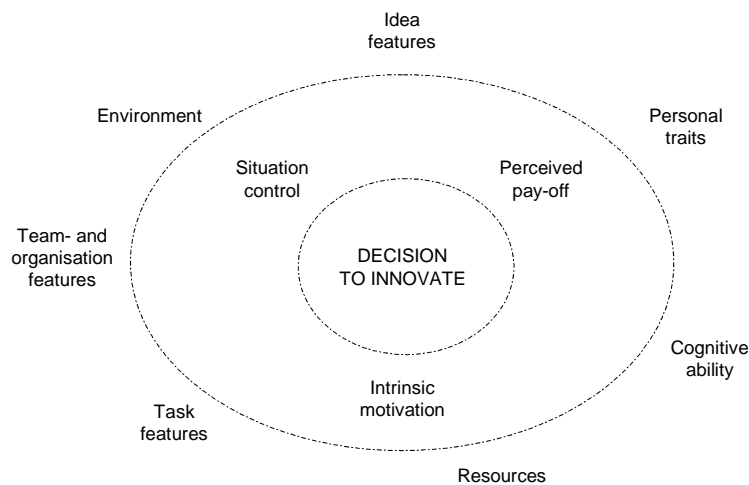


### 3 Antecedents of the decision to innovate

The main arguments we discussed previously have repeatedly been proposed to depend on many other factors. In their discussion of perceived pay-off, Farr and Ford (1990) for example suggest a number of factors that affect the individual's belief that innovation may result in positive outcomes. Examples include managerial and leadership behaviours, relationships with peers, organizational policies and procedures, and resources (p. 71-73). Likewise, Gebert (1987) and later on Krause (2004) claimed that perceptions of situation control depend on antecedents such as autonomy, time, budget, staff and knowledge and, if insufficient control is perceived, on the likelihood of reducing the discrepancy between the desired and actual state by procuring resources elsewhere, such as from a superior or supplier. Finally, intrinsic motivation has been demonstrated as depending on contextual factors such as competence and self-determination in relation to a given task and being supported and encouraged to take initiatives and to try new things rather than being influenced by constraints imposed by others (Zhou & Shalley, 2003).

Both innovation and entrepreneurship literature offer many potential antecedents of the decision to innovate. We have classified these in seven groups (figure 3).

figure 3 Antecedents of the decision to innovate



These groups of antecedents differ in their relevance to solitary entrepreneurs and employees in organisations. Most of them, *i.e.* idea features, personal traits, cognitive ability, resources, task features and environmental issues are believed to be relevant to all individuals. For team- and organisation features we expect only an association with employees' decision to innovate. This is for obvious reasons; entrepreneurs have no superiors and are expected to face less social pressure from their subordinates.

#### 3.1 Idea features

Some kinds of ideas are inherently better able to attract support. At the level of individuals, implementation is likely to go ahead if the idea is either marginal (appears off-to-the-side-lines so it can slip in unnoticed) or idiosyncratic (can be accepted by a few

people without requiring much additional support). When ideas need to be 'sold' to others, they are more likely to proceed when they are trial-able (can be demonstrated on a pilot basis), reversible (allowing the organization to go back to pre-implementation status if they do not work), divisible (can be done in stages), consistent with sunk costs (build on prior knowledge and resource commitments), concrete (tangible, discrete), familiar or compatible (consistent with past experience and compatible to existing practices), congruent (fit the organization's direction) and have publicity value (visibility potential if they work) (Kanter, 1988). If an idea differs substantially from these features, individuals generally face higher costs of implementation and will be less likely to proceed (Shane, 2003).

Empirical results of new product development projects confirm that ideas with particular features have a better chance of being successfully implemented. New products have been demonstrated to be superior if they meet users' needs, offer unique features not available in competitive products or solve a problem the user has. Winning products offer benefits or attributes easily perceived as useful by the customer, and benefits that are clearly visible (Cooper, 2003). Except for potential revenues, new products ideas are generally considered to be useful when they provide leverage for existing and in-house strengths, competencies, resources, and capabilities. In contrast 'step out' projects, that would take an organisation into territory that lies beyond its experience and resource base, increase the odds of failure (Cooper, 2003).

Entrepreneurship theory also stresses that some ideas are easier to implement than others. Entrepreneurship theory contrasts two extreme types of opportunities: Kirznerian and Schumpeterian opportunities. These opportunities have consequences for the type of idea that is identified. In a nutshell, Kirzner (1973) and Schumpeter (1934) disagreed over whether the existence of opportunities involves the introduction of new information (Schumpeter) or just differential access to existing information (Kirzner). According to Kirzner (1973) opportunity requires only differential access to information. Due to this people can obtain differential access to resources, and recombine them in different ways to realise a pay-off. In contrast, Schumpeter (1934) believed that new information is important in explaining the existence of opportunities. He argued that changes in technology, political forces, regulation, macro-economic factors and social trends create new information that individuals use to figure out how to recombine resources into more valuable forms.

Both types of opportunity lead to different types of innovative ideas. Schumpeterian opportunities induce a dis-equilibrating force. They involve radical types of innovation by the creation of something genuinely new (a product, process, service, etc) that disrupts how current products, processes and services across industries are made (Schumpeter labelled this phenomenon 'creative destruction'). In contrast, Kirznerian opportunities bring an economy closer to equilibrium. They involve less radical types of innovation as they tend to reinforce established ways of doing things and do not require new information. As a result, Schumpeterian opportunities can be regarded as more valuable and rare, but are also associated with substantial risk. The implementation of ideas based on Schumpeterian opportunities is more difficult and intense (Shane, 2003). Radical ideas face intense pressures to show that the idea is viable before the individual is allowed and/or supported to engage in implementation. This is due to the fact that individuals perceive potential losses more negatively, than they perceive gains positively. To most people a loss of \$10,000 has a larger negative value, than has a gain of \$10,000. Individuals therefore have a natural tendency to avoid risks (Baron, 2004).

Applying these findings to the context of the decision to innovate, we propose that relevant idea features include potential benefits to its proposed users, that may be customers, peers or other stakeholders, and acceptable costs in terms of resources and fit with current assets and competences. Any innovative idea will bear some uncertainty and will demand a learning effort, even in the case of incremental, simple innovations. But if a learning effort becomes too big, the decision to proceed will be less likely. Following the discussion above, we suspect that perceived pay-off and situation control will mediate between idea features and the decision to innovate. Idea features determine if an idea is feasible in terms of revenues and costs and if the required effort is realistic.

### 3.2 Personal traits

Both innovation and entrepreneurship researchers have put much effort into explaining the decision to implement by means of trait theory, which means that certain personality characteristics determine what happens with an innovative idea (e.g. Shane, 2003; Anderson *et al.* 2004). Differences in personal traits influence the likelihood that people will decide to innovate because these characteristics lead people to make different decisions about opportunities and ideas than other people with the same information and skills.

Personal traits are largely stable over time. People can and do change their personalities, but these changes are rare in comparison to changes in cognitive features and other proposed antecedents we discuss in subsequent sections. The discussion that follows presents five main traits that have been identified as drivers of the decision to proceed with innovative ideas: 1. extraversion, 2. need for achievement, 3. risk-taking, 4. locus of control and 5. self-efficacy.

#### *Extraversion*

Extraversion is an aspect of personality that incorporates the attributes of sociability, assertiveness, activeness, ambition, initiative, impetuousness, expressiveness, gregariousness, garrulousness and exhibitionism (Barrick & Mount, 1991). Individuals possessing such aspects of personality are more likely to implement ideas. The implementation of innovative ideas often includes the task of persuading others, particularly customers and employees/colleagues. The ability to persuade others that one's judgment is valid depends heavily on sociability, assertiveness and initiative, all of which are aspects of extraversion (Shane, 2003).

We therefore propose that extraversion makes a person more likely to generate enthusiasm and support among others and increase the likelihood that the individual will be able to implement ideas. We also expect that of the earlier mentioned arguments, situation control is a key mechanism that mediates between extraversion and the decision to innovate, as extraversion gives an individual better options to influence his/her environment.

#### *Need for achievement*

Need for achievement is a personal trait that makes people undertake activities and tasks that involve personal responsibility for outcomes, and requires individual effort and skill. Shane (2003) argues that the need for achievement is an important concept in one's decision to innovate. First, implementation of innovative ideas requires solving novel and ill-specified problems. The willingness and ability to solve such problems de-

mands an orientation toward meeting challenges, a characteristic of those people who are high in need for achievement (Harper, 1996). Second, the implementation of ideas involves goal setting, planning and information gathering. Achievement-oriented people have a strong tendency to plan, to establish future goals, to gather information, and to learn (Miner, 2000). Third, need for achievement generates the drive to exert the effort required to bring ideas to fruition. As a result, it increases the likelihood that a person will sustain goal-directed activity over a long period of time, persevering through the failures, setbacks and obstacles that are the inevitable result of decision making under uncertainty with incomplete information (Wu, 1989).

To summarise we propose that the need for achievement makes an individual more likely to proceed with innovative ideas. Possible intermediary variables between the need for achievement and the decision to innovate include situation control and perceived pay-off. We expect those with a high need for achievement to be aware of a better access to key resources and a more positive judgement of the benefits of implementation.

#### *Risk-taking*

Risk-taking propensity is an aspect of personality that measures people's willingness to engage in high-risk activities. People with a high risk-taking propensity are more likely to proceed with innovative ideas because risk is a fundamental part of any innovation process. Research for example suggests that firm founders have higher propensities to take risks than individuals in the general population (Shane, 2003). People with a higher risk-taking propensity appear to have fewer problems with ambiguous situations (Baron & Harrington, 1981; Patterson, 1999). Before a new product, service or process can be introduced, no one can predict with certainty that it will produce the desired outputs, meet consumers' needs, generate a profit, or capture that profit in the face of competition because no one can predict the future (Wu, 1989). There are technical and adoption-based risks to be faced, as no one knows exactly what type and amount of resources it will be needed to introduce the innovation, nor is it certain that the product, service or process will work, and whether proposed users will adopt the innovation (Amit *et al.* 1993).

We thus propose that a risk-taking propensity makes a person more likely to accept the ambiguities and uncertainties of the implementation phase, and makes him/her more likely to proceed. We also expect that of the three main arguments, situation control and intrinsic motivation will be intermediary mechanisms. Those with high risk-taking propensities are expected to perceive more opportunities to obtain key resources and genuinely enjoy working towards implementing the idea.

#### *Locus of control*

Locus of control is the extent to which a person believes to be able to influence his/her environment, *i.e.* the extent to which individuals believe that their actions affect outcomes (Rotter, 1966). According to various scholars, individuals characterised by an internal locus of control, (*i.e.* they believe that their actions directly influence the outcomes of an event) are more likely to undertake innovative activities. They have a stronger sense that they can control their environment, and will be more likely than people with an external locus of control to proceed with innovative ideas. The confidence that individuals have in the value of an innovative idea depends, in part, on their evaluation of their own abilities to exploit the opportunity. This self-evaluation, in turn, depends on the degree to which the individual believes that he/she can influence the environment (Harper, 1996).

Individuals with an internal locus of control are therefore proposed to be more likely to proceed with innovative ideas. We also expect that perceived situation control is a mediating variable, as individuals with this trait will be more aware that they are better able to influence their environment.

#### *Self-efficacy*

In their proposed model of individual innovation, Farr and Ford (1990) assumed that the likelihood of an individual introducing an innovation is a function of self-efficacy, defined as self-perceptions about one's ability to produce and to regulate events in one's life. It relates to the individual's perception that change can be successfully implemented in a situation, i.e. one's efficacy beliefs concerning the implementation of change. Self-efficacy is expected to have a powerful impact on human behaviour, especially behaviour related to change. Innovative individuals make subjective assessments about uncertain opportunities that differ from the subjective probabilities made by others. Consequently, they must have confidence in their own judgment and must not become too uncomfortable at the prospect of being wrong or at odds with a sceptical and disbelieving majority (Casson, 1995). Strong perceptions of self-efficacy result in the individual approaching tasks with enthusiasm, expending great amounts of energy toward task accomplishment and persistence in the face of obstacles (Bandura, 1982). Those with serious doubts about their capability to succeed, on the other hand, are more likely to avoid the activity, exert little effort, and give up quickly.

We propose that individuals with high self-efficacy are more likely to innovate. We also propose that situation control is a mediating variable. Since individual innovation may involve both uncertainty about future outcomes as well as possible resistance from others affected by the change, the individual who possesses a reasonable amount of self-efficacy will face fewer barriers and problems in obtaining the necessary resources to change the situation when implementing innovative ideas.

### **3.3 Cognitive ability**

Entrepreneurship literature has demonstrated that most entrepreneurs are not continuous innovators. After having founded a company once to exploit a business opportunity, they refrain from new innovations once their company is successful. This implies that a decision to innovate at one point in time will not necessarily predict later engagement in innovation. Some individuals may have an innate preference to innovate, but others appear to implement innovations accidentally, suggesting that factors other than personal traits are relevant.

The cognitive abilities of individuals are one of the alternative antecedents of the decision to innovate. In the past both innovation and entrepreneurial researchers have attempted to explain innovation from a cognitive point of view, implying that prior knowledge and experience affects the innovation processes (e.g. Shane 2000, Baron 2004). We propose that cognitive abilities enable an effective implementation of innovative ideas. The more an individual disposes of relevant knowledge and expertise within a given domain, the more likely he/she is to effectively implement an idea within that domain.

Cognitive abilities of individuals are more easy to change, e.g. by means of training and education. Unlike personal traits cognitive abilities vary significantly over time, and are

largely situation dependent. Past studies suggest various factors as a proxy for the cognitive abilities of individuals: 1. Education, 2. Work experience and 3. Age.

### *Education*

Entrepreneurship theory demonstrates that a person will be more likely to exploit an opportunity if he/she is better educated. The information and skills that education provides will increase the expected returns for opportunity exploitation. Education increases a person's stock of information and skills, including those needed to pursue an opportunity. Moreover, education improves entrepreneurial judgment by providing people with analytic ability and an understanding of the entrepreneurial process (Casson, 1995). According to the extent that an individual has been educated in the relevant skills and information to exploit opportunity, he/she faces less uncertainty about, and has greater expectations of, the value of the opportunity (Hebert & Link, 1988).

Innovation literature also suggests a positive connection between education and idea implementation. Previous studies into the innovative work behaviour of individuals for example used education level as a control variable to rule out the impact of differences in cognitive ability (e.g. Scott & Bruce, 1994).

Taking these insights in the context of the decision to innovate, we propose that an individual's education level associates positively with the decision to proceed. We also propose that situation control is an important mediating variable, as education equips an individual with what is needed to implement innovations.

### *Work experience*

While education provides is one useful route for gathering that information and those skills that are useful to implement innovative ideas, work experience may be another. Through work experience, people develop information and skills that facilitate the formulation of implementation strategies, the acquisition of resources, and the process of organising. Indeed, entrepreneurship literature suggests that work experience is a proxy for the access of individuals to knowledge and abilities needed to exploit opportunities (Shane, 2003). Besides, innovation studies of individuals in organisations usually apply tenure as a control variable. Just like education level this serves as control for differential cognitive abilities of individuals (e.g. Scott & Bruce, 1994; Janssen, 2000). To date literature has suggested that work experience can be operationalised with various indicators:

- General business experience, measured as the number of years of work experience, increases the likelihood that a person will innovate. Through general experience, people gain information about many of the basic aspects of business which are relevant to innovation. Moreover, it provides training in the skills needed to implement innovations, including selling, negotiating, leading, planning, problem-solving and communicating (Romanelli & Schoonhoven, 2001; Klepper & Sleeper, 2001).
- Functional experience also influences the likelihood of the decision to innovate. Many innovative ideas draw dis-proportionally on knowledge of marketing, management and product development rather than on knowledge of finance and accounting which are more easy to outsource (Roberts, 1991). Therefore, people with functional experience in marketing, product development and management are more likely to decide to innovate.
- Industrial experience may also stimulate the decision to proceed with innovative ideas. People with prior experience in an industry as a customer or supplier often have a better understanding than others of how to meet demand conditions in the

relevant market. Experience in industry provides information that outsiders cannot gather (Johnson, 1986).

In all we propose that an individual's work experience is positively related to the decision to proceed. We also predict that situation control is the most important mediating factor as work experience provides cognitive abilities that help to implement innovations effectively.

#### Age

Another cognitive factor that influences the tendency of people to innovate is age. Unlike education and experience, which are proposed to have a positive impact, age is expected to have a curvilinear relationship. Age incorporates the positive effect of experience, but this effect is believed to diminish as older people generally perceive fewer challenges and less variety in their work (see section 3.5). Besides, as people age, their willingness to bear uncertainty and to take risks declines because their time horizons shorten (Shane, 2003).

Age is thus not a mechanism in itself, but can be thought of as a factor that captures other proposed antecedents, including work experience, job variety and risk-taking propensity. Depending on the nature of an empirical test, age could be a useful control variable. Alternatively a curvilinear relationship could be tested; the relationship between age and the probability of proceeding with innovations would be an inverted U-shape. On the upward curve perceived situation control would be an important mediating variable. On the downward curve intrinsic motivation is expected to be relatively important.

### 3.4 Resources

Resources such as time, physical and financial means, are needed to enable the implementation of almost any idea. Innovation research has demonstrated that resources are critical to trigger employees to start with and remain committed to innovative activities within organisations. As Janssen *et al.* (2004) point out, the implementation of an innovation can be costly because getting acquainted with new ways of working will take extra work time of those involved. Studies of new product development projects show that many new products within larger organisations suffer from a simple time and money commitment, resulting in higher failure rates (Cooper, 2003). Especially when a competitive situation arises, managers respond by restructuring and doing more with less, so resources are limited or cut back. As a consequence employees perceive diminished incentives to innovate. The availability of resources is thus important for innovation. However, the optimal amount of resources is a subject of debate. Nohria and Gulati (1996) suggested that within organisations an optimal level of 'slack' is required for innovation. They defined slack as the 'pool of resources in an organization that is in excess of the minimum necessary to produce a given level of organizational output. Slack resources include excess inputs such as redundant employees, unused capacity, and unnecessary capital expenditures' (p.1246).

Work arrangements that would help employees to implement ideas include the possibility to use a set portion of their time for independent work developing their own ideas, and the availability of internal 'venture capital' to assist the realization of innovations. 3M corporation is an often-mentioned example of these aspects. In an interview on the firm's strategy the chairman of 3M, de Simone, stressed that 'researchers are allowed to

devote 15% of their time to projects that pique their interest, even those on which management has already pulled the plug...if you want to encourage innovation, you have to close your eyes when people are so excited about a project that they refuse to stop' (Ernst, 2002, p. 15).

Entrepreneurial literature also considers resources to be a key aspect in the decision to innovate. Exploiting opportunities requires the acquisition and recombination of resources before the sale or introduction of the output of that recombination (Aldrich, 1999). Research shows that established entrepreneurs prefer to finance innovations from the cash-flow of their current operations, rather than borrow money from a bank or venture capitalist. About seventy percent of all entrepreneurs exclude the possibility of external finance, as – in their view - most financiers impose annoying restrictions on their future behaviour (Shane, 2003). Nonetheless, entrepreneurs appear to be highly proficient in obtaining resources from informal network partners, including family and relatives, main suppliers and customers. Entrepreneurship literature thus suggests that a well-developed resource base is an advantage, but not the most critical contingency factor for the decision to innovate. An individual's resource mobilisation skills - the ability to acquire resources needed to implement an innovative idea – can very well compensate an initial lack of resources. Features that may help to build resource mobilisation skills include the earlier mentioned traits (e.g. extraversion) and cognitive abilities, but also the possession of a large network of informal contacts (see hereafter).

We propose that a perceived lack of resources will discourage individuals from putting effort into an innovative idea. Also, we expect that perceptions of resource availability will depend on personal traits (especially extraversion), cognitive ability and the possession of particular network contacts. In terms of the earlier mentioned key arguments that influence the decision to innovate, situation control may be the most important variable to mediate between perceptions of resources and the decision to innovate.

### 3.5 Task features

A frequently-used model of task features of individuals is the one developed by Hackman and Oldham (1980). Their five-factor theory includes two task features which are often investigated as driving forces behind the innovative efforts of individuals: 1. variety and 2. autonomy. As a third relevant task feature, we propose 3. an individual's external work contacts. We elaborate on these features below.

#### *Variety*

One primary aspect of a job that is supposed to enhance idea implementation is the extent to which individuals perceive variety in their tasks. Job variety determines if a person is motivated. In his work on team level innovation, West (2002) argues that certain task characteristics can result in an intrinsic motivation that is fundamental for innovativeness within a team of persons. Drawing on Hackman and Oldham's (1980) theory of job content, the task that evokes such motivation is described as 'a whole task, that is perceived by the team as significant for the organisation or wider society; that makes varied demands on team members and requires them to use their knowledge and skills interdependently; that provides opportunities for social contact between them; and provides opportunities for learning, skill development and task development' (West, 2002; p. 379). We expect that similar features will apply to individuals. Individuals with a task that permits various kinds of activities, with full responsibility for a project from start to finish, are more likely to be committed to their work and to proceed with inno-



vative ideas. Research has demonstrated that these particular aspects boost an individual's innovative work behaviour (e.g. De Jong & Den Hartog, 2005). According to Amabile (1996), of all the things one can do within the borders of organisations to stimulate employees' innovative work behaviour, perhaps the most effective is the simple task of matching people with the right assignments.

In entrepreneurship literature evidence of the impact of job variety is more difficult to find but a few studies indirectly suggest that an entrepreneur's 'decision to innovate is also enhanced by a variety in the tasks Past research shows, for example that in small firms with standardised products and work processes ( e.g. retail trade, hotels and restaurants, hair dressers) innovation is less common than in firms with differentiated and knowledge intensive products (e.g. consultancy services, chemical products IT services) (De Jong, G Muizer 2005) In the latter type of industry entrepreneurs probably have more opportunities to innovate as they derive their economic value from diverse and varied activities. Similarly, Baum and Locke (2004) refer to the fact that entrepreneurs with more challenging goals achieve a better business performance, which is partly due to more intensive opportunity exploitation

Perceived variety in a job is proposed to relate positively to one's probability to proceed with ideas. Variety enhances individuals' intrinsic motivation and this should facilitate their eagerness to implement innovative ideas. We thus regard intrinsic motivation as a relevant mediating variable between variety and the decision to innovate.

#### *Autonomy*

Autonomy, is defined as the ability to determine independently how to do a job or certain task, has very often been associated with individual innovation. Most of the evidence relates to employees in organisations. Autonomous employees are believed to be better motivated and able to implement innovative ideas effectively, because they are in control and able to deal with bottlenecks during the implementation phase. In an empirical study among 360 knowledge workers in 36 service firms, De Jong and Den Hartog (2005) showed that the amount of autonomy that is perceived by knowledge workers is directly related to their innovative work behaviour. Spreitzer (1995) also showed that when employees experience autonomy, they feel less constrained and are more likely to demonstrate innovative behaviours. Research on the initiation and implementation of ideas by Axtell et al. (2000) suggests that autonomous forms of working are also crucial in creating the employee attitudes necessary for implementing such new ideas.

Entrepreneurship literature barely mentions autonomy as a driver of opportunity exploitation. This is for obvious reasons: entrepreneurs are self-determining in most situations. Although we would not expect autonomy to be a bottleneck for them, the entrepreneurship literature does provide some findings that indirectly stress the significance of autonomy for the implementation of ideas. A well-known motive to become an entrepreneur, for example, includes 'a desire to be independent and enjoy the advantage of a free life' (Shane, 2003). There are also many entrepreneurs who find themselves controlled by market circumstances. In some industries (e.g. specialised manufacturers of car parts, metals or textiles) entrepreneurs are dominated by a few large customers, and find that they must conform with their dictated market conditions. This limits the range of potential innovation opportunities to those enabling cost savings (Shane, 2003). Other ideas are simply difficult to implement.

Given these findings, we propose a positive connection between perceived autonomy and the decision to innovate. Mediating variables may be intrinsic motivation and situa-

tion control. Intrinsic motivation is relevant because autonomy makes individuals more enthusiastic and committed to a task itself, rather than having to worry about what others (leaders, customers, etc) require. Such individuals will experience higher levels of intrinsic motivation to proceed with an innovative idea. Likewise, autonomy is likely to result in a positive appraisal of situation control. Whenever a need for change is seen, on the condition that the individual perceives sufficient situation control, he/she is better able to implement innovative ideas in the hope of improving the situation that needs to be changed.

#### *External work contacts*

External work contacts relate to the frequency and scope of one's contacts with individuals or groups outside the organisation such as customers, suppliers, knowledge institutes and competitors. For employees in organisations, innovation literature suggests that those with more frequent and diverse external work contacts are more likely to proceed with innovative ideas. External contacts provide the individual with a source that helps to better understand customers' needs and wants, the competitive situation, and the nature of the market. The analysis of new product development projects for example demonstrated that these factors are critical to new product success (e.g. Ernst, 2002). Even in the case of technology-driven new products (where the idea comes from a technical or laboratory source), the likelihood of success is greatly enhanced if customer and marketplace inputs are built into the implementation project soon after its inception. Conversely, a failure to adopt a strong external orientation spells disaster (Cooper, 2003).

The notion that individual innovation benefits from external work contacts is not new. Kanter (1988) had already noted that close contacts with 'need sources' were an important innovation activator. In her words: 'Contact with those who see the world differently is a logical prerequisite to seeing it differently ourselves' (p. 175). In this context, Perry-Smith and Shalley (2003) developed propositions on the association between social relationships and the related construct of creativity. They suggest that individuals with frequent external work contacts will dispose of a more diverse network with many weak ties. The access to non-redundant information and diverse social circles provided by these weak ties facilitate a variety of processes helpful for creativity.

In this context, entrepreneurship literature stresses the importance of social ties. Those individuals with frequent external work contacts can be regarded as having a large and diverse network. This network in turn serves as a source of resources and information. To be able to implement an idea individuals must be able to gain access to resources that facilitate implementation. These resources are often obtained through a person's direct and indirect social ties (Aldrich, 1999). For example, entrepreneurship research has demonstrated that entrepreneurs use their social contacts to obtain information about things such as permits, management practices, appropriate investors, and trustworthy suppliers.

We propose that the scope and frequency of an individual's external work contacts are an antecedent of his/her decision to proceed with an innovative idea. Possible mediating variables are situation control and perceived pay-off. A large and diverse network helps the individual to gather resources, so his/her feelings of situation control will be improved. Likewise, external work contacts give one the opportunity to collect sensible feedback and to better assess the feasibility of an innovative idea. This in turn results in a better assessment of the perceived pay-off of the idea and thus enhances its implementation.

### 3.6 Team- and organisation features

Innovation literature also provides a number of factors which relate only to employees within organisations. We have labelled these as team- and organisation features. Here we elaborate on three of such features: 1. climate for innovation, 2. leadership and 3. rewards systems. These factors obviously do not relate to solitary entrepreneurs, but they may affect the decision to innovate of those who are not self-employed.

#### *Climate for innovation*

Climate relates to the feelings, attitudes and behavioural tendencies that characterise organisational life (Nystrom, 1990). It is at the heart of the informal structure of a work group or organisation. Groups can exert powerful pressures on employees to adjust their behaviour. The more strongly an employee is attracted to a group and wishes to remain part of it, the more likely he is to conform to the majority view within the group. A deviant person will be subject to strong persuasive pressures and eventually, if he does not conform, will be excluded from the group (Tesluk *et al.*, 1997). Thus, if norms and values in a work group prescribe 'innovation', individuals within that group will be triggered to be innovative. One relevant study in this context was performed by Axtell *et al.* (2000). Drawing on a survey among the employees of a manufacturing plant, they concluded that climate for innovation is important to realise innovative outcomes. It makes a difference if employees find their colleagues to be supportive as soon as promising ideas have been approved and have to be implemented. Another example is the work of Cooper (2003). In his investigation of new product development projects he demonstrated that a positive climate for innovation is one which supports and encourages intrapreneurial efforts and risk-taking behaviour. In such a climate employees will be more happy and willing to proceed with innovative ideas.

Innovation literature proposes different dimensions of an innovative climate. Each of them can be hypothesised to related to the decision to innovate. To mention a few examples (for a detailed discussion we refer to West, 1990; West & Hirst, 2003):

- Vision. A vision is an idea of a valued outcome that represents a higher order goal and motivating force at work (West, 1990). Work groups with clearly defined objectives are more likely to be effective and to develop new goal-appropriate methods of working since their efforts have focus and direction. This could well be related to individuals' decision to proceed with particular innovative ideas.
- Participative safety. When employees realise their colleagues' attitudes and behaviour are protecting their welfare and interests in ways that allow them to experiment, the climate can be described as having a strong socio-emotional support. West (1990) proposed participative safety as an aspect of innovative climate, based on the thought that involvement in decision-making is motivated and reinforced while occurring in an environment which members of the organisation perceive to be interpersonally non-threatening.
- Constructive controversy. This may improve the innovative performance of a work group (Tjosvold, 1998). Constructive controversy is characterized by the full exploration of opposing opinions and frank analyses of task-related issues. In the same context De Dreu and West (2001) argue that minority dissent, meaning that a minority within the group publicly opposes the beliefs of the majority, causes members to rethink current paradigms, resulting in higher rates of innovation.
- Task orientation. Another dimension of climate for innovation is concern among group members about the excellence of task performance, characterised by evaluations, modifications and positive-critical appraisals. High standards of performance

are encouraged, and a diversity of approaches to achieve excellence is tolerated (West, 1990).

- Support for innovation. This relates to the norms of innovation or the approval and practical support of attempts to introduce new and improved ways of doing things (West, 1990). In many instances groups, as part of their objectives or social desirability, express support for the development of new and improved ways of working, but often do not provide 'enacted' support in terms of time and/or money investments. West (1990) therefore distinguishes between 'articulated' and 'enacted' support for innovation, and claims that both types of support are necessary for attempts to introduce innovations.

To sum up: climate for innovation is expected to relate positively to the decision of individuals to innovate. Following from the discussion above, it is likely that perceived situation control is a main mediating variable. Facilitative group norms can be expected to influence individuals' perceptions of their ability to change a situation where there is a performance gap. Intrinsic motivation and perceived pay-off however may also play a role. Facilitative group norms can ensure that individuals are able to focus on their tasks rather having to worry about the approval of their work group. Also, group norms in favour of innovation can affect how individuals perceive the benefits of idea implementation: recognition of peers can enhance individuals' perceptions of a positive pay-off.

### *Leadership*

Leadership is an influential factor for those individuals in a subordinate position. There is actually much to say about how leaders (managers, entrepreneurs) affect the decision-making of their subordinates. From previous work we derive that particular leadership styles are relevant to stimulate employees' willingness to implement ideas. Leadership styles that have been frequently associated with individual innovation include participative leadership, transformational leadership, and direct support for innovation:

- Participative leadership involves the use of various decision-making procedures that determine the extent to which people can influence their leader's decisions, and have autonomy to design and guide their own tasks. Such leadership can take many forms, including consultation, joint decision-making and delegation (Yukl, 2002). In the context of individual innovation participative leadership is often identified as an important antecedent (Rickards & Moger, 2006). Participation is likely to increase the ownership that employees feel for the outcome of decisions made and their commitment to these, which should increase the likelihood of them trying to propose new and improved ways of fulfilling these outcomes. One study that found empirical support was carried out Axtell *et al.* (2000). It revealed positive connections between participation and employees' innovative output. We propose that in order to enhance idea implementation leaders should use a substantial amount of consultation, joint decision-making and delegation. This enhances employees' intrinsic motivation and situation control, and (as a consequence) their willingness to proceed with innovative ideas.
- Transformational leadership attempts to explain how certain leaders are able to achieve extraordinary levels of employees' performance. Transformational leadership predicts followers' emotional attachment to the organisation and emotional and motivational arousal of followers as a consequence of leader behaviours like charisma, inspiration, individual consideration and intellectual stimulation (Den Hartog, 1997). This form of leadership has been shown to encourage individual innovation by employees (e.g. Krause, 2004). It has also been connected to the outcomes of creative work, such as R&D projects (e.g. Keller, 2006). In line with Shin and Zhou (2003) we propose that transformational leadership positively affects

employees' decision to innovate. A transformational leader encourages experiments to explore new ways of doing things, to test new products, services and procedures, or in other terms, to abandon old ways of life and make way for new ones. Intrinsic motivation is expected to mediate the relationship. Under conditions of transformational leadership employees are better able to focus on the tasks at hand and do not need to worry about external constraints imposed by their leader (cf. Shin & Zhou, 2003).

- Leaders can also try to exert a direct influence on decision-making by their subordinates by providing support and by recognizing their innovative efforts. Previous work suggests that individual innovation is triggered by the provision of verbal support (e.g. Krause, 2004), recognition of innovative efforts (Judge *et al.* 1997) and by enacted support *i.e.* providing resources to implement innovations (Judge *et al.* 1997; Nijhof *et al.* 2002). Such behaviour improves employees' perceptions of situation control and boosts their intrinsic motivation.

We stress that leadership is probably one of the key antecedents to stimulate employees' decision to innovate. Except for direct linkages, leaders also have an indirect impact via many other factors we discussed so far. For example, leaders play an important role in shaping the climate of their teams and organizations (West *et al.* 2003). Leaders have several primary 'climate embedding mechanisms', including what leaders regularly pay attention to, measure, and control (Schein, 1990). In addition, leaders are able to influence the distribution of resources, personal traits of employees (via recruitment procedures), cognitive ability (via training programmes) and task features (by assigning persons with varied tasks, and with frequent external contacts). Through all such mechanisms leaders can (consciously or unconsciously) influence whether innovative ideas are valued and if they are implemented.

#### *Reward system*

Although the potential role of climate and leadership seems relatively clear, this is less so for reward systems. A reward system that explicitly accounts for innovation would include pay increases and bonuses for innovative performances. The perceived pay-off argument predicts that employees will feel stimulated to implement ideas, but the intrinsic motivation argument suggests that individual innovation may actually be diminished. Extrinsic motivation – which we propose discourages one's willingness to proceed with ideas - is based on incentives coming from outside. These include monetary rewards. Providing rewards can actually 'crowd out' intrinsic motivation leading to a diminished innovation performance (cf. Frey & Jegen, 2001).

We propose that in situations of modest rewards employees perceive a reward for innovative efforts as a sort of recognition. Their intrinsic motivation will not be diminished, so we would expect them to proceed with ideas. On the contrary, when a reward is too big and becomes an objective in itself, intrinsic motivation may be crowded out. Under such conditions extrinsic motivation may compensate the perceived payoff of implementing innovation, and we cannot predict what the connection between rewards and the decision to innovate will look like.

### **3.7 Environment**

Any entrepreneur or individual within an organisation has to deal with a wider environment. As we discussed in section 3.5, individuals' contacts with the extra-organisational environment can partly determine whether or not proceeding with inno-

vation is likely. We here propose that the extra-organisational environment also influences the pay-off one perceives from idea implementation. This topic so far remains uncovered in innovation research, but entrepreneurship studies have produced some interesting insights. Entrepreneurship theorists wonder if people are more likely to exploit opportunities in particular industries. Industry differences appear to affect the performance of people when they try to implement innovative ideas. Various authors found, for example, that the nature of the industry in which a new firm is founded influences its survival (Audretsch, 1991; Bates, 1994). Some industries are more supportive of opportunity exploitation than others; industry influences the level of income earned from innovative activity (Kalleberg & Leight, 1991). The evidence suggests that people are more likely to perceive a pay-off and proceed with innovative ideas in some industries than in others.

Yet, the identification of particular industries as supportive or unsupportive to innovation is still parsimonious. The imprecision of this answer has led some researchers to ask what it is about some industries that make them supportive of innovation. According to Shane (2003), these differences include knowledge conditions, market demand, appropriate conditions and industrial structure:

- Knowledge conditions affect the ability of individuals to build on externally produced innovations. For example, in some industries there will be more knowledge spill-overs, e.g. when publicly funded research plays a relatively large role in technology development individuals face more spill-overs from R&D-labs. Also, knowledge creation can be so costly and complex that only large companies can provide the required resources (e.g. pharmaceuticals). These conditions determine to what extent individuals can implement technology-related ideas.
- Market demand characteristics also affect opportunity exploitation as these characteristics determine the revenues that may be obtained. When demand is high and industries are more profitable, idea implementation is more beneficial. In such conditions an individual can develop an uncertain opportunity and has a better chance to remain above minimum average cost while the opportunity is being developed.
- Appropriability regimes include whether patents and other forms of protection apply and how they are arranged. They affect the ease of imitation of (technology-based) innovations. For example, some technological advances can be exploited only when costly or complex complementary assets can be mobilized. It affects whether individuals perceive a pay-off from fundamental research, or it can make them refrain from copying innovations that have been developed elsewhere.
- The characteristics of the companies that already operate in a particular industry, as well as the characteristics of customers and suppliers, will also affect the attractiveness of opportunity exploitation. When, for example, a few large players dominate the market, or when new entrants have modest profit margins or face considerable entry barriers, the likelihood of proceeding with ideas declines.

## 4 Conclusions

We investigated what makes individuals (entrepreneurs, employees in organisations) decide to proceed with innovative ideas. We combined innovation and entrepreneurship literature to develop propositions of what influences the decision to innovate after an idea has been recognised. This is an important topic as practitioners in organisations (managers, entrepreneurs) and policy makers face the challenge of realising continuous innovation.

Three main arguments we propose to be directly associated with the decision to innovate are perceived pay-off, situation control and intrinsic motivation. Previous studies always looked at these arguments in isolation. We propose that the decision to proceed with an innovative idea will be most stimulated when all three arguments are satisfied, no matter if a solitary entrepreneur or an employee within an organisation makes the decision. The three main arguments provide a basis for a cumulative, three-componential theory of an individuals' decision to proceed with innovative ideas.

Potential antecedents of the decision to innovate can be classified in various groups. We labelled them as idea features, personal traits, cognitive ability, resources, task features and environmental factors. Again, these factors can be relevant to both entrepreneurs and employees. Another category relates to team- and organisation features, including climate for innovation, leadership and reward systems. For obvious reasons we propose that these factors are relevant for employees only. For many factors we also expect that some of the main arguments (perceived payoff, situation control and intrinsic motivation) will mediate between a specific factor and the decision to innovate (e.g. situation control would mediate the relationship between resource availability and idea implementation).

This study has some significant shortcomings that need to be solved in future work. First our propositions are still speculative. A future empirical test must demonstrate which propositions can be confirmed. Second, our overview of potential antecedents is incomplete. It covers some factors which are frequently mentioned as drivers of idea implementation. Our overview is meant to illustrate the scope of what makes people to proceed with innovations. Future studies could list and test more factors. Third, our discussion is simplified in such a way that we by-passed potential cross-relationships between the proposed antecedents. An example includes the role of leadership; we identified that leaders are probably a driving force behind many other antecedents, but it is unclear how these connections should be modelled.

Despite these shortcomings, the overview gives some valuable insights for practitioners. When managers, for example, wish to enhance their employees' innovative efforts, our overview summarizes many factors that can play a role and provide a source of inspiration to formulate and plan interventions. Such interventions can be direct (e.g. providing support and resources for innovation) or indirect (e.g. reshaping tasks of subordinates like external work contacts and job variety). Our overview also indicates that part of the ability of subordinates to innovate is due to personal traits and therefore hard to change.

Policy makers may learn from our findings that there is more to life than solving bottlenecks in innovation processes. Most of the current innovation policy interventions aim

to relieve bottlenecks like resource and knowledge availability, by providing subsidies or by stimulating public-private partnerships for example. Implicitly, policy makers seem to rely most on the situation control argument to stimulate innovation. Our overview suggests that intrinsic motivation and perceived pay-off are also important, but current policies almost completely ignore these issues. What can be done to stimulate the intrinsic motivation of people? What is the perceived pay-off they expect from proceeding with innovative ideas, and is there a role for public policies here? For example, a serious reflection on what policy interventions are suitable to enhance the intrinsic motivation of individuals to innovate would probably reveal many new interventions. Rather than focussing merely on money and knowledge deficits, new policies could aim at the attitudes and career planning of individuals.



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