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CAUSAL MAPPING THE COGNITIVE UNDERPINNINGS OF ENTREPRENEURSHIP: LESSONS FOR ENTERPRISE RESEARCH AND DEVELOPMENT?

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Summary: This study explores nascent micro entrepreneurs' and small business advisors' causal beliefs about entrepreneurship and micro business. The aim is to contribute theoretically by illuminating the cognitive preconditions of micro entrepreneurship, largely overlooked so far, and by providing new insights for developing entrepreneurship. After the introduction, the paper discusses the study's conceptual background, context and method, comparative causal mapping (CCM). The study finds that the respondents share coherent belief systems about the focal issues. The findings, presented as aggregated causal maps, are corroborated by examining the elicited active concepts' saturation and by comparing the actors' predicted and actual counselling behaviours. The discussion addresses the results' validity and usefulness, the method's ability to reveal deeper entrepreneurial beliefs and, lastly, the study's limitations and implications for research and entrepreneurship development.

INTRODUCTION

This study explores nascent micro entrepreneurs' (NME) pre-founding beliefs about individual entrepreneurship and small firm performance. For complementary evidence, also the NMEs' small business advisors' (SBA) respective belief systems are examined. The aim is to understand better the *cognitive* preconditions of small-scale entrepreneurship and firm formation and to provide new insights for entrepreneurship development and support.

Two streams of entrepreneurship research inform the study. The first explains entrepreneurship and new firm's emergence and performance. Typical findings have emphasized entrepreneurs' personality, motives/drivers and competences and various aspects of the environment (Carter *et al.,* 2003; Everett and Watson, 1998; Frank *et al.,* 2007; Jayawarna *et al.*, 2011; Jenkins and McKelvie, 2016; Ricketts, 2008; Shane *et al.,* 2012; Shonesy and Gulbro, 1998). A newer trend emphasises the role of cognitions, e.g., processes of perception, inference and decision-making. A recent, partly cognitive approach in entrepreneurship studies is based on the *theory of planned behaviour* (TPB) (Ajzen, 2002, 2011; Fishbein and Ajzen, 2010; Kautonen *et al.,* 2015). On this view, entrepreneurial action is preceded by intentions, which result of behavioural beliefs and attitudes, social beliefs and subjective norms and perceived situational control. These in turn are considered to depend on the actor's underlying general beliefs. The TPB framework can be applied without revealing these beliefs, which means that they have not been researched, although this could illuminate "… the formation of entrepreneurial intentions and the process leading from intention to behaviour." (Fayolle and Linãn, 2014, p. 665; Krueger, 2003, 2007). This study explores the belief systems of two entrepreneurial actor types, nascent micro entrepreneurs and their advisors, and aims to contribute new factors and explanatory mechanisms to entrepreneurship theory (Whetten, 1989).

The study's other conceptual base and empirical context is that of entrepreneurship policy especially concerning small-scale entrepreneurship development and practices. Academic views differ here from totally rejecting to undecided and lenient to warmly supportive, reflecting whether purely economic or also social and ethical criteria are observed (Acs *et al.,* 2016; Atherton, 2006; Garcia-Lorenzo *et al.*, 2018; Minniti, 2008; Shane, 2008). In actual practice, developed countries like the UK or Finland support micro entrepreneurship and self-employment, not only growth-start-ups, using measures like financial support and maintaining advisory organizations for free or low-cost counselling of nascent entrepreneurs. It is argued that this promotes the entrepreneurs' private interests and policy goals such as local job creation or reducing unsound groundings, which could cause unwanted private losses and firm/job churning (Bennett, 2014; Laukkanen and Tornikoski, 2018). Entrepreneurship researchers have examined different aspects of small business counselling and its impacts (cf., e.g., Bennett and Robson, 2005; Chrisman and McMullan, 2004; Dyer and Ross, 2007; Ramsden and Bennett, 2005; Stenholm and Aaltonen, 2012). However, cognitive studies of small business advisors are rare (cf. Laukkanen and Tornikoski, 2018; Mole, 2000) and NMEs' cognitions have been studied not at all. This study elicits both NMEs' and SBAs' belief systems, assumed to be active in counselling situations, to suggest new insights for SBA practices.

Hopefully, the study can also foster cognitive studies in entrepreneurship, increasingly endorsed as an important direction (Mitchell *et al*., 2002; Baron, 2004; Baum *et al*., 2011; Grégoire *et al*., 2015; Randolph-Seng *et al*., 2015). Much of this thrust comes from cognitive psychologists, who tend to

emphasize studying general micro-level cognitive processes, which appear especially relevant in entrepreneurship, asking, e.g., "Why do some persons but not others recognize opportunities" (Baron, 2004:221). Arguably, however, the scope of "appropriate" topics in entrepreneurship should include also more down-to-earth questions like what do some real actors know/think about a given issue or how do different situations or external changes influence their belief patterns. This influences indirectly the perceived realism of cognitive research in entrepreneurship via perceptions concerning the necessary theoretical and empirical work. This can be seen, e.g., by comparing clinical and especially neuroscientific methods (Nicolaou *et al.*, 2019) to approaches, which can be administered in real organizations with real persons. In general, a certain "declinicalisation" of cognitive research might be beneficial. For instance, although obvious it is sometimes forgotten that the *contents* of people's minds, their knowledge/beliefs, cannot be accessed directly, independent of them[1]. Cognitive (and entrepreneurship) researchers must usually ask people and hear/see what they say/write to infer what they know/think (Evans, 1998; Markman and Gentner, 2001). Fortunately, our position is similar as in other applied fields, which are interested in the cognitive determinants of the behaviours of actors like top managers or politicians. Management and organization cognition (MOC), political science, information technology and environmental studies have long explored actors' knowledge/belief systems (*aka* cognitive maps, mental models) (cf. Axelrod, 1976; Hodgkinson and Clarkson, 2005; Jones *et al.,* 2011; Narayanan, 2005) using interviews or questionnaire or documentary data, which are analysed by qualitative, interpretive methods or semi-quantitative approaches such as the present cognitive/causal mapping. This study can perhaps contribute by presenting a case of a cognitive topic, method and findings, which entrepreneurship researchers can concretely assess.

The paper is structured as follows. The next section discusses the study's conceptual underpinnings, research questions and design. The third section describes the empirical context, respondents and methodology. The fourth presents the NME and SBA respondents' elicited belief systems using aggregated causal maps (ACM). This enables predicting the belief systems' impact on counselling situation. The predictions and indirectly the present method approach's validity are tested. The last section discusses the study's findings, theoretical and methodological implications and limitations and suggests some possibilities for entrepreneurship development and further research.

CONCEPTUAL BACKGROUND

The direct starting point of this study was the growing number of studies, which explain or predict active or potential entrepreneurship in terms of the *theory of planned behaviour* (Ajzen, 2002, 2011; Fayolle *et al.,* 2006; Fayolle and Liñán, 2014; Liñán *et al.,* 2011; Kautonen *et al.,* 2015; Solesvik *et al.,* 2012). According to TPB, entrepreneurial behaviour such as starting a micro firm is preceded by *intention*, which is a combined product of the actors' *attitude* and subjective *social norms* concerning the behaviour and their *perceived behavioural control* (PCB). These in turn are posited to depend on the actors' *behavioural beliefs* about the behaviours' consequences, *normative beliefs*

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[1] In clinical studies, mental models are also inferred indirectly of behaviors, e.g., systematic errors in problem-solving tasks, and then corroborated using interviews and/or questionnaires (Gentner, 2004; Evans, 1998).

about what others expect, and *control beliefs* regarding things perceived to further or hinder the behaviour. It is realized if/when an opportunity arises and there is behavioural control, as perceived by the actor. Typically, TPB studies explain 30–45% of intentions and, for obvious reasons, somewhat less (around 25%) of behaviours (Armitage and Conner, 2001; Kautonen *et al.*, 2015).

The TPB constructs are measured using responses to statements to indicate the existence/non-existence and strength of the respective affective or instrumental attitudes or beliefs. For instance, agreeing with statements like "Entrepreneurship is very advantageous for me" suggests instrumental beliefs about entrepreneurship's impacts; agreeing that "Persons close to me support my becoming an entrepreneur" indicates a social belief and a corresponding norm; and agreeing that "There are no practical difficulties to my becoming an entrepreneur" would imply (positive) control beliefs (or attitudes). Thus, elicited TPB attitudes/beliefs represent readily accessible thinking (Ajzen, 2011; Sutton *et al.*, 2003). This "surface" level is assumed to be underpinned by higher-level, "deep" knowledge structures, e.g., "cognitive scripts, mental schemas, and maps" (Fayolle and Linãn, 2014, p. 665). This suggests questioning are there such things, what are they about and how might they influence the attitudinal or belief constructs and intentions. To illuminate them, Krueger (2003, p. 110) suggests cognitive science methods (!) such as "…causal maps, schemata and scripts…." Taking this as a working point of departure, this study uses causal mapping to reveal the NMEs' (and SBAs') relevant belief systems, operationalizing them as individual and aggregated cause maps.

What are beliefs? In the TPB, beliefs are subjective probabilities that objects like a behaviour have certain attributes (Fishbein and Ajzen, 2011, p. 90). More usually, beliefs or knowledge[2] refer to general propositions, commonly held to be true, which inform actors in particular about what exists and how things work in the world (Good 2001). This is perhaps also roughly what, e.g., Krueger (2007, p.124) meant when defining beliefs "deeply held strong assumptions that underpin our sense-making and decision making". What makes beliefs important? In general, there is extensive evidence that beliefs/knowledge and conscious thoughts influence behaviours, often in combination with situational and affective factors (Baumeister *et al.*, 2011). This is based on our basic capability to think symbolically and represent internally, with sufficient accuracy, what exists in relevant parts of the world and how everythings functions. This enables discerning and making sense of the phenomena and issues one encounters and must solve, influence or adapt to (Johnson-Laird, 1983; Hill and Levenhagen, 1995). Particularly important is *causal* knowledge, i.e., distinct units and variously coherent systems/models of knowledge/beliefs, which enable explaining, predicting and inferring things and thus understanding, purposive problem-solving and planning and consequently also formation of intentions and goal setting in everyday and professional contexts. Cognitive psychologists call such representations (causal) *mental models* (Johnson-Laird, 1983; Markman and Gentner, 2001; Rouse and Morris, 1986; Sloman and Lagnado, 2015), in the case of spatial objects, *cognitive maps*. In applied studies like political science or MOC (Axelrod, 1976; Narayanan, 2005) parallel terms include *belief systems*, mind-sets, theories-in-use, earlier also cognitive maps.

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[2] The so-called classic definition is that knowledge is a well-grounded, true belief. However, our knowledge-in-use is largely socially acquired and accepted/believed as true and it is practically difficult to clearly differentiate knowledge and belief. Therefore, these notions are used here basically as synonyms.

Why study entrepreneurial actors' beliefs? In general, adequately isomorphic knowledge of one's action domains is a precondition of their "practical" or "successful" intelligence, which survival and performance requires (Baum *et al*., 2011; Sternberg, 2004). Revealing entrepreneurial beliefs and understanding better their functioning should provide a better theoretical grip of entrepreneurship's origins and also new ways to develop entrepreneurship by influencing active or potential entrepreneurs' beliefs. This is implied when entrepreneurship information is disseminated in media and by education measures (Albarracin and Shavitt, 2018; Fishbein and Ajzen, 2010), but also small business counselling can be considered a cognitive intervention. The SBAs use their general and local knowledge for inferences and recommendations about the individual projects and persons and provide their clients information and a better sense of entrepreneurship and business. Counselling situations involve also the parties' more or less divergent preconceptions, which influence their expectations, approaches and the outcome. Therefore, it seems useful to study the NMEs' and their advisors' those belief systems, which are probably active in a counselling situation.

The functions of NMEs' or SBAs' mental models and causal knowledge can be understood by considering what usually happens when someone must explain or comprehend something, solve a problem or make a decision in real or artificial task situations like responding to interviewing. A typical first step is to try to recall a relevant retained mental representation of the situation as distinct units of causal knowledge or a model. Sometimes this suffices; sometimes it provides scaffolding for building *ad hoc* a situationally adapted new model using imagination and local information. Whatever the case, the model is simulated "in the mind's eye" by mentally intervening in the target system as conceptualized (Baumeister *et al.*, 2011; Hagmayer and Sloman, 2009; Sloman and Lagnado, 2015). This enables *if-then* inferences and flexible, imaginary thinking even about novel things till a subjectively satisfactory solution, plan or understanding, is found and realized or communicated as the situation demands. Obviously, situations and their significance and the generated representations' complexity and veridicality vary.

As to the origins of, e.g., NMEs' knowledge/beliefs, some is acquired/learned experientially and vicariously over time. Today, however, a large part is concepts and ideas, which are acquired gradually by social transfer in cultural indoctrination, during formal education and later in everyday organizational arenas and by media, which too have different original sources (Bandura, 1986; Chi and Ohlsson, 2005). Knowledge adoption follows a rough functional logic: things which are regarded or socially defined as relevant to one's tasks or position or are somehow personally attractive will be acquired, other things tend to be ignored. Thereby, new material replaces old usually gradually and unconsciously by attrition, sometimes resulting of strong new evidence or social pressure. The outcome is that normal adults, let alone educated/expert persons, possess a huge repository (Chi and Ohlsson, 2005) of distinct knowledge/beliefs and variously complex and coherent systems/models at different levels of generality, veridicality and accessibility (tacit/explicit), but mainly about domains, which are practically or subjectively important.

The notion and key role of causal beliefs and models has methodological implications. Such knowledge refers by definition to things and events and their cause-effect, temporal or correlational relationships, which the actors perceive exist. It follows that *cause maps*, which consist of nodes and arrows, can represent important parts of actors' causal knowledge and mental models, in particular their phenomenological and causal, i.e., systemic or mechanism aspects. For researchers

cause maps enable describing and mentally simulating the actors' thought patterns to understand their or the target systems' behaviours. As noted, a dilemma in cognitive research is the lack of a direct access to peoples' minds' contents. Like attitudes or intentions, causal beliefs and mental models are theoretical constructs. Their existence and contents must be inferred of communications like documents or interview statements to acquire data, e.g., for causal maps (Axelrod 1976, Gentner 2004, Jones *et al.,* 2011). This entails problems of validity as discussed below.

The above suggests two research tasks. The first concerns finding out about the "underlying beliefs" of entrepreneurial actors and assessing the findings in terms of the TPB. To elicit the beliefs of nascent micro entrepreneurs (NME) and, for a complementary perspective, those of their small business advisors (SBA), the study uses *comparative causal mapping* (CCM) as described below. To tap beliefs, which can be assumed to underlie these actors' reasoning in counselling, the interviews focused on two topics: (a) the causes and consequences of becoming an entrepreneur and (b) those of micro firms' success/failure. To corroborate the CCM results, the groups' typical belief systems and their counselling behaviours are compared by predicting the topics and foci of typical counselling situations and by corroborating the predictions using an SBA questionnaire.

The expectations about the probably emerging belief systems are twofold. First, the present NMEs' educational and work-life backgrounds are diverse (see below). They may have considerable knowledge of some domains but, in terms of entrepreneurship, they are lay persons with the important difference that they seriously consider entrepreneurship; otherwise they would not be the SBAs' clients. Thus, they have probably thought about entrepreneurship and been receptive to and actively sought related information. Their belief systems should reflect that but this is difficult to predict except that they probably emphasize the positive outcomes and the general feasibility of the idea. In terms of TPB compatibility, the NMEs' beliefs are expected to correspond to the TPB notions of behavioural, social and control beliefs. As to the SBAs, they are professionals who regularly evaluate and assist NMEs. Their knowledge systems should be rather sophisticated and also reflect their tasks and objectives in private and public terms.

The second task concerns the implications for SBA practices. It was argued above that revealing and understanding entrepreneurial actors' beliefs, in this case of the NMEs and the SBAs, can provide new insights, which benefit SBA practices, but which are otherwise not possible. In a positive case, this would support the usefulness and feasibility of a more cognitive approach in entrepreneurship development. This will be assessed in the discussion section.

CONTEXT, RESPONDENTS, METHOD

Research context
The study's context is the *Finnish Entrepreneurship Agencies (*FEA), the country's only nationwide provider of advisory services to micro entrepreneurs. Currently, FEA has 29 local agencies, which employ 90 SBAs assisted by local expert networks. In a typical year, FEA serves around 15 000 clients and helps found 8 000 firms. This corresponds roughly to one half of early-stage entrepreneurs and a third of all new firms in Finland. The FEA's main function is to evaluate prospective entrepreneurs' business ideas and qualifications and to offer no-cost advice whether and

how to realize the project. FEA provides also business contacts and formal recommendations about start-up allowances or loans. Currently only the start-up phase is covered.

Participants

The study's nascent micro entrepreneur (NME) participants are clients of two FEA agencies. Because FEA cannot disclose client information, the participation had to be based on the NMEs' voluntary decisions. The criterion was that they had not yet begun the counselling so that the interviews would reflect their pre-founding thinking. The idea was to grow the sample stage-wise by observing the emerging concepts' saturation. For scheduling reasons this could not be followed exactly, resulting in a somewhat larger sample than strictly necessary (see below).

The NME sample (N=13) had 8 female and 5 male participants. Their mean age was 44,1 yrs. (SD 10,24) with a range of 27-57 yrs. Notably, 6 NMEs have a university, 5 a polytechnic degree and 2 a trade school one. This indicates a higher education level compared to GEM studies' average NMEs (Suomalainen *et al.,* 2016) or to Finnish enterprise allowance receivers, of whom 42 % of had a polytechnic degree and 24 % a university degree (Stenholm and Aaltonen, 2012).

The SBAs' belief systems were elicited for an earlier study (Laukkanen and Tornikoski, 2018). This group (N=15) had 6 female and 9 male SBAs with a mean age 45.3 yrs. (SD 8.76). All had considerable counselling experience (7.9 yrs. SD 6.24). The majority had an MSc, some a BSc in business and also several years' experience as an owner-manager or of a family business.

Comparative causal mapping

This study uses a *comparative* variant of causal (aka cognitive) mapping (CCM) (Laukkanen and Wang, 2015) to reveal and analyse the studied actors' individual knowledge/beliefs. There are some caveats. First, as noted, there is no direct access to people's minds' or memory substance. The existence and contents of theoretical constructs like causal beliefs or mental models/maps must be inferred of their communications, in this case verbal. Second, it is not assumed that CCM fully exposes the "black boxes". Considering the complexity of normal adults', let alone professionals' knowledge base, there is no practical way to do that. What is possible is to locate beliefs about *specific* research-relevant domains, issues or phenomena, in the present case the actors' notions about entrepreneurship and micro business by semi-structured interviewing (SIM) around two anchor topics: (1) Why does (or does not) someone become an entrepreneur and what are the consequences, and (2) The causes and consequences of micro firms' emergence and success/failure. The results are expected to illuminate the cognitive underpinnings of entrepreneurship and new firms' emergence and to be also relevant for SBA/NME practices. Both aspects can be assessed by analysing the findings and the theoretical and pragmatic inferences they suggest. Thus, the study is indirectly also a methodological test of the CCM approach. Third, a general property of causal mapping is to combine original binary causal statements (a➜b) first into individual cause maps (ICM), which represent an actor's retained and transitory causal knowledge/models and inferences about the target domain/issue. Depending on the respondent's actual knowledge/expertise relative to the domain, ICMs can be accurate or inflated representations of the actual knowledge/belief base (Leiser, 2001). This applies also to the ACMs as intersections of the ICMs. Thus, it is not suggested that every or an average NME or SBA has a coherent or similar belief system as represented by the ACMs. The point is instead to describe and understand the ideas and concerns, which probably

characterize the NMEs' pre-entrepreneurship thinking and, respectively, the SBAs' notions, which are likely to underpin typical counselling situations. To corroborate the findings, the study examines what actually tends to happen in the present counselling situations.

At the outset of the CCM/SIM interviews, the process was explained, emphasizing that no sensitive issues will be discussed and that the main thing is to hear the respondents' own views. SIM interviews begin by asking the respondent to tell first about the causes of the (first) anchor topic and then about its consequences. This produces a primary stratum of original notions, more easily recalled as the anchor phenomenon's causally proximate causes or effects. Next, the format is repeated but using the just elicited original concepts as new anchors. This produces a large number of new concepts, causally perhaps more distant from the anchor notion but still representing the interviewees' retained beliefs or natural *ad hoc* mental models and inferences. The present interviews covered only the antecedents of the primary causes and the consequents of the primary effects. The NME interviews lasted M=66.77 min (SD=13.99). In the SBA interviews the present anchor topic took roughly 2/3 of the total time (M=80.0 min, SD=16.9).

SIM raw data consist of a large number of original causal statements, i.e., concept pairs (a➜b, b➜c, etc.), where a notion, rather its referent, is stated to influence or cause another concept, to follow from/after it or to be caused by it. The NME data contain 923 original concepts (M=71.00, SD=16.49 per respondent) and 1 312 causal relationships (M=100.92, SD=21.69 per respondent). The SBA data consist of 1 153 original concepts (M=76.87, SD=19.14 per respondent) and 1 539 causal relationships (M=102.60, SD=28.10 per respondent).

A critical step in CCM studies is raw data's coding. It converts the original concepts (in Finnish) into standard terms (in English), which represent the distinct phenomena referred to by the former. Coding enables observing synonyms and homonyms and removing other (presently) redundant details like polar states or qualifying attributes. The coding was at low level, where the standard terms are close to the original concepts. This implies less compression and fewer problems of interpretation. To ensure the coding's validity, it was evaluated by two external reviewers (below).

The coded data were processed by a CCM application (CMAP3[3]). This creates two datatables, one containing the active standard concepts (SNT, node terms), one the standard causal units (SCU), i.e., cause-effect pairs. The process also determines which and how many respondents "own" a given SNT (i.e., used a thus coded original concept) and SCU (i.e., the respective original causal statement). This enables distilling a specific respondent's or group's active standard causal links, which can be converted into pictorial ICMs or ACMs. CMAP3 also calculates indicators such as ICM densities and mutual distances.

Validity in CCM studies
Validity means usually a methods' ability to measure what it is expected to measure; in this case, does the CCM/SIM method tap and the resulting ICMs satisfactorily represent the respondents' knowledge/belief systems and inference tendencies. In interview studies this depends primarily on the interviewees' sincerity (Axelrod, 1976): Did they say what they think and mean what they say?

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[3] CMAP3 software and support documents can be downloaded without cost at: http://www.uef.fi/cmap3.

This can only be inferred from the context. In this case the interviews were conducted in neutral surroundings following a standard protocol and allowing roughly equal response times. Second, the topics were non-sensitive and there were no obvious motives or time for the participants to actively hide or to fabricate things. Therefore it is assumed that the data reflect the participants' sincere responses and readily accessible knowledge and reasoning tendencies.

A key issue is CCM coding: Are the original notions correctly interpreted as same-denoting with the respective standard concept and other original concepts in the category? The goal is satisfactory semantic validity so that the standard terms (in English) make sense and the original concepts (in Finnish) have been consistently coded observing their original referents. The present coding was reviewed by two experts familiar with the method and the context. The average percent agreement was high (NME IRR=99.42%, SBA IRR = 98.51%)[4].

A CCM specific validity indicator is the emergence of shared individual cause maps, which is also a precondition of plausible ACMs. A useful indicator of convergence (or its lack) is the *saturation* of the respondents' active standard concepts from the first to the last respondent. In this case (Figure 2), around 90 % of both groups' active concepts emerged already by the 7th respondent, i.e., roughly half of the samples. This indicates that both within-group belief systems (about the focal issues) are fairly homogeneous and that the method taps them satisfactorily.

Finally, cause maps' validity can mean the belief systems' ability to predict respective behaviours. In general, actors' (sincere) beliefs and proximate behaviours like statements or decisions have been found to be consistent (Axelrod, 1976), the connection obviously weakening over time. This validity aspect was assessed by examining typical counselling situations as discussed below.

FINDINGS

This section examines the NMEs' and the SBAs' individual belief systems' convergence and presents the typical contents as aggregated cause maps (ACM). The ACMs will be used to infer the belief systems' manifestations as issues addressed in NME/SBA counselling. The last subsection discusses an SBA survey testing the inferences.

Diversity or uniformity
The idea of ACMs is to capture the actors' *typical* thought patterns. This requires that the ICMs, which underlie the ACMs, are widely shared. This is indicated by the respondents' concepts' saturation (Nelson *et al.,* 2000). As shown in Figure 1, in this case most active concepts in both groups emerged by the 7th respondent. After this point each additional respondent contributes only one or two new concepts. As the causal links follow the concepts, this indicates that the NMEs' and especially the SBAs' individual belief systems (about the focal issues) are fairly homogeneous.

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[4] IRR calculation used *http://dfreelon.org/utils/recalfront/recal3*. This yields a high average percentage agreement but low chance-corrected IRR measures (e.g., Fleiss' Kappa=0.0029). This is not unusual with few disagreements in a large number of coding decisions (Feng, 2015). Percentage agreement is recommended in cases of well-informed judges and unlikely guessing (McHugh, 2012).
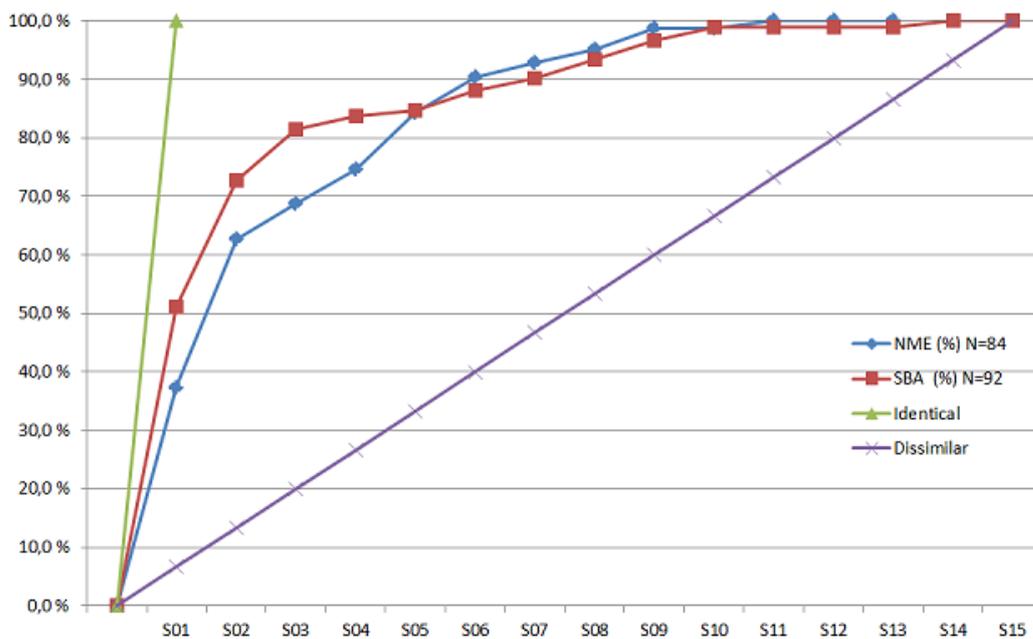
Figure 1: Saturation of the NMEs' (n=13) and the SBAs' (n=15) active standard concepts

The result means also that smaller samples would have sufficed to locate the core belief systems as required by the research task (Guest *et al.,* 2006). This is hindsight, but helps set an appropriate sharedness level for intersecting the ICMs to produce the ACMs. This is partly a subjective, partly a practical issue. In the literature, cut-off points of around 50 percent have been suggested (Carley, 1997, p. 536), in this case N=>7. This happens to correspond to the present saturation pattern and was therefore adopted. Testing other values showed that lower points produce impractically dense ACMs with many idiosyncratic concepts; higher ones respectively excluding probably common ones. The present level seemed a satisfactory compromise as indicated by ACMs' nodes' median total frequencies (TF = number of respondents owning the notion): in the NME ACM (Figure 2) Md/TF = 9.0, in the SBA ACM (Figure 3) Md/TF = 8.0.

Belief system contents

The first ACM (Figure 2) summarizes the NME's entrepreneurship and business related beliefs. It contains 37 standard concepts and 56 relationships (SCUs), some of which reciprocal, a concept appearing both as a factor and an outcome. The concepts in bold refer to phenomena, which practically all NMEs noted.

The ACM's upper part displays the NMEs' ideas about entrepreneurship. They explain it first by personal goals such as ensuring livelihood, independence and better life quality. Successful entrepreneurship realizes them, which is why they appear as drivers and outcomes. The NMEs also think that specific traits and motives can differentiate entrepreneurs from "normal" persons and drive them. Second, there are salient beliefs about entrepreneurship's business aspects. Some note that a Business Idea (BI), a product/service or detected need can be a trigger. Furthermore, the NMEs think entrepreneurship requires certain competences, but their ideas about this are vaguer. Notably, for most NMEs the main reason preventing entrepreneurship is *fears* concerning failures'

consequences and the uncertainties of launching and running an NMF. Further noted deterrents are the absence of the above "push" or "pull" factors or not being an "entrepreneurial type".
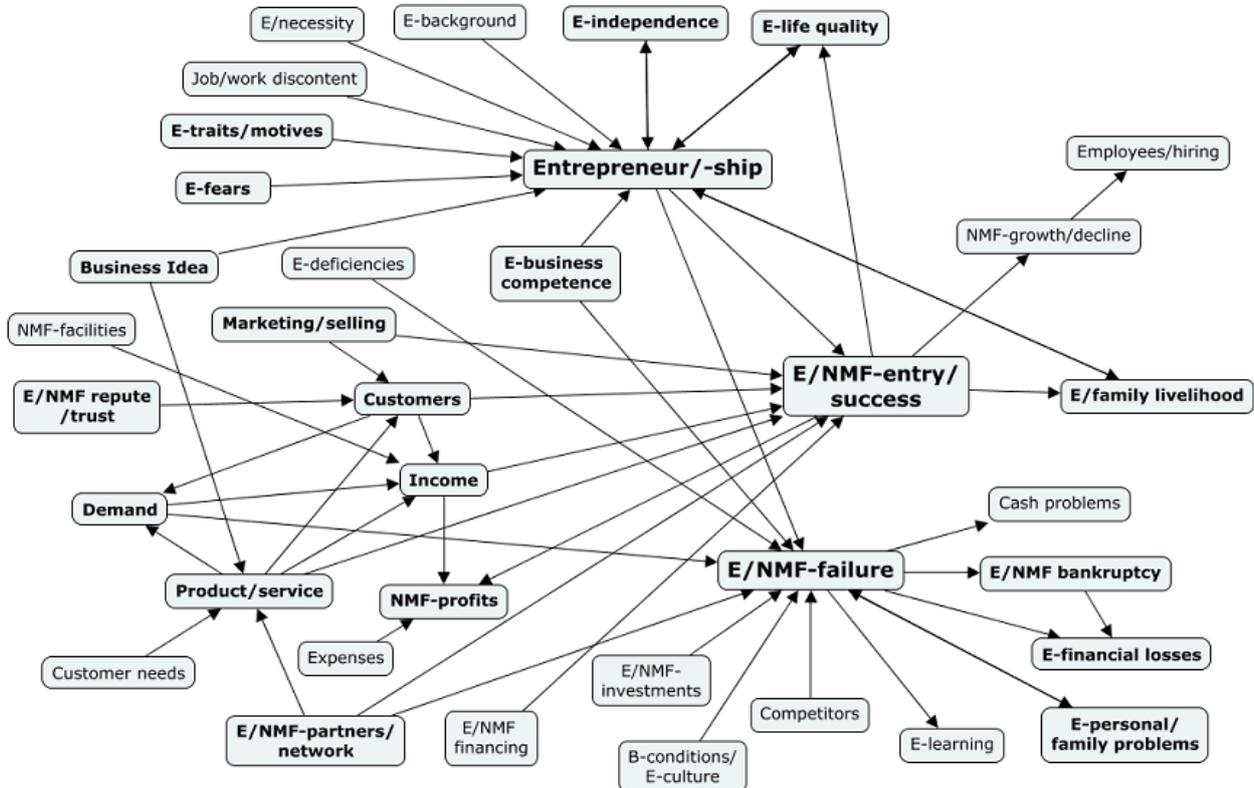
Figure 2: The NMEs' aggregated cause map

The ACM's middle part displays the NMEs' beliefs about new micro firm (NMF) success. The explanations are twofold: an active, competent entrepreneur and a product/service, which is based on the BI and corresponds to customer needs and attracts customers, possibly with partner network support. As ways to influence customers, the NMEs are aware of marketing, personal selling and of the eventually earned reputation. As key outcomes of NMF (and entrepreneurial) success, the NMEs emphasize again ensuring a livelihood and a better life quality. As more distant results, some mention NMF growth, need to hire personnel and creating jobs and public welfare resources. Notably, only two NMEs noted traditional motives like affluence or social status. Perhaps these too are perceived as more hypothetical issues in this early stage.

That entrepreneurship can also fail seems a major concern to the NMEs as shown by the respective subsystem's density in the ACM. Failure causes to the NMEs are deficiencies in key factors like demand and competence or partner issues, e.g., losing an outsourcing contract, but also personal weaknesses. Further failure factors include investment errors, intense competition and unforeseen changes of conditions such as barriers to customer traffic or a sudden emergence of new technologies. Surprisingly, to most NMEs failure always means a *bankruptcy* with major financial losses and personal and family problems. The usual unforced, undramatic termination seems

unknown[5]. At the same time, the NMEs' attitude is remarkably euphoric: Failures can happen but not to one, but should it happen, one can return to a wage-earning job or start anew having learned a lot. This may reflect common tendencies to avoid cognitive dissonance (Fiske and Taylor, 2013), here between one's intentions and perceived risks. At this stage, it is perhaps natural to handle the dissonance by minimizing the latter.

When analysed for correspondence with the TPB model, it is evident that the NMEs' belief system contains a number of concepts and causal notions, which could logically underlie their expressed behavioural and control beliefs/attitudes, assuming they are inquired. This can be seen in the complex of condition, factor and goal conceptions about individual entrepreneurship and in their notions about entrepreneurship's business aspects, which seem rather developed. However, somewhat unexpectedly, these NMEs' belief systems contain practically no references to social factors like external pressure or norms, which promote or block entrepreneurship. Notably, only a couple of NMEs mentioned things like entrepreneurial culture or continuing a family firm, not common enough to appear in the ACM.

Figure 3: The SBAs' aggregated cause map

The ACM in Figure 3 summarizes the SBAs' beliefs about the causes and consequences of new micro firms' emergence and success/failure. It contains 58 nodes and 114 causal links, some reciprocal. The nodes in bold are shared by practically all SBAs. Compared to the NME ACM, it is clearly more complex, indicating more sophisticated thinking about the focal issues. For the present analysis the most relevant is the ACM's left side, which displays the SBAs' views about the factors

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[5] In Finland, 8-10 % of firms' terminations are formal bankruptcies (2016: 2408/24870 = 9.7%). Moreover, most of these involve SMEs, not small micro firms.

and mechanisms of NMF success or failure. This subsystem comprises two primary factor sets and mechanisms. One is the NME's proposed business, manifested as a rough BI or a more developed business plan (BP). Key factors to the SBAs are the existence of demand, "paying customers", competitiveness in view of the local competition and the available resources. The SBAs also emphasize BP quality. In general, the SBAs' perceived business factors are symmetrical and continuous, i.e., they have different states with respective impacts on the total system and outcomes. Second, the SBAs emphasize the NMEs' entrepreneurial characteristics, where they discern several backgrounds and sub-dimensions. A specific failure factor is the NMEs' negative attitudes/traits, which refer to issues like strong introversion, laziness or alcohol or moral problems.

Correspondence of beliefs and counselling behaviours

As noted above, cause maps' predictive ability requires a reasonable correspondence of the participants' core belief systems as represented by the ACMs with the foci and contents of typical counselling sessions. The ACMs suggest two broad areas, which both sides can be expected to address and one grey area, which may or may not be an issue in typical counselling.

The first predictable focus is the NMEs' proposed BI and their intentions and goals, which they seek to accomplish. This seems evident considering the salience of the corresponding elements in both parties' typical belief systems. Moreover, this is common neutral ground, understood as clearly relevant by both. For the NMEs these issues concern the very preconditions of entrepreneurship; for the SBAs these are standard topics which they are accustomed and also prepared to handle. Using their accumulated experience and business and local knowledge experienced SBAs can usually quickly assess a proposed BI in rough terms of possible vs. unrealistic and also detect which aspects need more clarification. Thus, the SBAs contribute mainly by ensuring that the NMEs understand the issues and can/will solve them and draw the correct conclusions.

The second predictable focus is the NMEs' qualifications and capabilities. The NME ACM suggests an awareness of their importance. However, NMEs can seldom assess their own qualifications relative to the project's demands. Although critical, these questions too appear neutral and are probably openly addressed. For the SBAs, however, NME qualifications and capabilities present a dilemma. Although the ACM suggests that they know the significance of NMEs' characteristics, they are difficult to assess in practice. Presumably, the evaluations represent a mixture of (1) inferences about the NME's background; especially work experience, (2) the quality of "homework" like the BPs, and finally, (3) subjective personality assessments. The SBA ACM seems to support this: The included entrepreneur-related factors are largely those of which some information like work background or education is available, or which are inferred, not necessarily validly, of the NMEs' overt behaviours, e.g., extraversion or meticulousness.

Overall, the ACM findings suggest that typical counselling sessions are (in this case) business-like, non-emotional affairs. The exception and difficult to predict issue is the NMEs' fears, which appear significant to them but apparently not to the SBAs. This could reflect difficulties of handling them or simply practical pressures to prioritise the obligatory business and capability issues. Be this as it may, it would seem that NMEs' qualms are not routinely tackled but that this can vary depending on different NMEs' attitudes and needs.

The above predictions were tested by inquiring the SBAs. They have experienced numerous counselling sessions, whilst the present NMEs had not yet participated in one. This provides asymmetrical evidence, but it was assumed that at least the NMEs' most pressing concerns would be manifested in the SBAs' responses. Technically, a set of FEA units was selected at random and a list of SBAs built, who were asked to answer an open email questionnaire. As above, the idea was to follow saturation logic, collecting data successively till no new response types were found. Here this point was reached at N=15[6]. The data were entered into a worksheet to distil typical behaviour categories or response patterns. The following summarises the results.

There is usually 1 or 2, sometimes 3 sessions (S) of 1.5-2 hrs. S1 examines the NME's situation, business idea (BI) and a tentative business plan (BP), if prepared. In about half of the cases the process ends here because the BI is found unrealistic and/or the NME decides to give up. The rest, potential founders, get homework (BP, evidence of turnover, etc.) and expert network contacts. In S2 the BP and new evidence are analysed, resulting in SBA recommendations. Eventual S3s are for technicalities like founding, enterprise allowance applications, and support network.

The counselling seems to focus on two areas, as predicted. The first is the BI and its realism. The SBAs look for evidence of demand or for a plausible business model and revenue logic. However, it is the NME who must provide the proof, e.g., in the form of customer contacts, test marketing or expert opinions. The SBAs evaluate also the adequacy of resources. The second area is the NMEs' capabilities. The SBAs say they look for two things: (a) the NMEs' personality, ideally "a good E-type" with evident high motivation and drive, and (b) their practical capabilities, especially knowledge of the specific business and customers and their skills and resources like financing capacity. Whilst assessing capabilities present mainly factual problems, the personality assessment seems quite subjective reflecting each SBAs' observations, experiences and preconceptions. Formal personality tests are not used.

Overall, the SBAs find business plans important. They provide a shared platform and structure the process and contents of counselling. For the NMEs, BP models are checklists of things to observe and guides for planning and financial calculations. For the SBAs, prepared BPs enable assessing the project's feasibility and the NMEs' communication skills, and indirectly, their business understanding, knowledge and capabilities.

As noted, NME fears were found salient in their belief systems but not in those of the SBAs. To clarify this, the SBAs were asked how they handle fears and sensitive issues in general. The responses suggest three approaches. The prevalent, typical of male SBAs, is a cheerful approach, where qualms are believed to vanish when the NMEs begin to believe in their projects' feasibility and understand its practical realization. The second approach, characteristic of female SBAs, provides sympathetic listening, advice and encouragement. Finally, there is a rare "ostrich" approach, which denies the existence of such phenomena. Overall, nearly all SBAs say they are prepared to discuss sensitive issues *assuming* an NME wants that, which, however, seems quite unusual among the FEA clients. Why this is so is an interesting question.

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[6] These SBAs'(N=15) mean age was 54,50 (SD 7,82), average SBA-experience 17,08 yrs. (SD 9,12) and business experience 20,69 yrs. (SD 12,22). 10 had an MSc, 4 a Polytechnic (BBA) degree, 1 undefined.

DISCUSSION

This section assesses the CCM findings first generally and in terms of the research task of accessing the deep belief structures, assumed to underlie the TPB studies' attitudes and beliefs. It also discusses the study's methodological implications and limitations, suggests some directions for future research and addresses its implications for entrepreneurship development.

Assessing the CCM findings

The findings can be assessed first in terms of their (face) validity as descriptions of the NMEs' and the SBAs' belief systems about individual entrepreneurship and firm formation and performance. This calls for subjective simulating, in the mind's eye, the situation and thinking of hypothetical NMEs or SBAs, and asking would such persons think approximately as suggested by the ACMs.

To begin with the SBAs, perhaps a key observation is that they conceptualize factors, issues and mechanisms, which are clearly relevant when assessing typical NMEs and their businesses. With the exception of NME's personalities, the SBAs emphasize phenomena, which can be reasonably well known in normal conditions. The findings suggest that, assuming correct information, the SBAs can usually provide appropriate recommendations and guidance, thereby observing predominantly their clients' personal and business interests. As to the NMEs, although their belief systems appear much simpler than those of the SBAs, there is considerable overlap. At least these NMEs have, for lay persons, a rather developed initial mental grip of entrepreneurship and business, which should provide a sufficient basis for productive counselling. However, there is a caveat. First, CCM coding unavoidably hides some of the NMEs' typical lay notions about business processes and conditions. For instance, they did not use and thus probably do not possess basic accounting and financial concepts. Furthermore, as noted, CCM necessarily combines original binary causal statements into models, which may or may not represent the actual belief systems, but determining this is difficult and requires knowing the respondents' experience and educational background. In this respect, the SBAs' ACM appears plausible whilst the NME ACM probably exaggerates their typical actual level of thinking.

The ACMs can be examined also for things, which are not there or which suggest biased notions. In this case, the NMEs seem unaware of failure causes and risks caused by difficulties with key stakeholders. Their ideas about failure's consequences are overdramatic. The SBAs probably overemphasize stereotypic ideas of "proper" entrepreneur personalities and the predictive power of overt "Big 5" traits such as extraversion or agreeableness (Zhao *et al.,* 2010), known to predict entrepreneurial performance only moderately compared to learnable capabilities. Further SBA biases include bypassing the indirect social and economic consequences of micro entrepreneurship such as local displacement and their risk aversion, which can lead to overcautious recommendations (Laukkanen and Tornikoski, 2018).

Lastly, the elicited belief systems can be assessed in terms of *behaviour correspondence*. This study examined the NME/SBA counselling interaction, finding that the SBAs' and indirectly also the NMEs' belief systems correspond broadly to the foci and processes in typical counselling. However, the responses also suggest that not everything the NMEs' and SBAs' elicited beliefs imply will be explicitly addressed. This concerns in particular the NMEs' fears and personal

characteristics. This may have cognitive but also practical grounds like available time and resources, possibly also cultural ones, suggesting further research.

Comparing CCM and TPB beliefs

As noted earlier, the NME ACM suggests that their belief systems correspond to two of the TPB model's main dimensions (motives/goals, means), but show no traces of shared social beliefs. The more interesting question, however, is did the present approach capture the NMEs' "deep knowledge structures" as implied by the research task? In this respect, it is evident that CCM and TPB studies elicit very different beliefs. Responses to typical TPB statements do not reveal beliefs as such but rather *imply* the existence (or non-existence) of a given belief and indicate its strength, e.g., that someone has weak or strong beliefs about entrepreneurship's benefits or none at all. In contrast, CCM elicits directly actors' phenomenological beliefs (A exists, A is/has x) and causal beliefs (A➔B, B➔C). This follows of the acquisition method, here the SIM interviews. Another important method consequence is that only *existing* beliefs emerge thereby.

But does causal mapping tap the "deep knowledge structures"? At first glance it may seem so. For instance, if it is shown that someone knows/believes that entities like jobs, entrepreneurship, business idea and sales-based income exist, and has a causal belief that becoming an entrepreneur creates a job which brings income which one needs, it is logical to expect that the person agrees with a statement that "Entrepreneurship is beneficial to me". However, emphasising knowledge structures may oversimplify human cognitive processes. As noted, people possess (more exactly, have been found to behave as if they did) large repertoires of distinct causal knowledge and varyingly coherent mental models, which are retained and more or less accessible in long-term memory. However, to use (or to communicate) that knowledge, it must be processed in conscious working memory (see, e.g., Jonides *et al.*, 2005). This involves not only memory recall but also *generative* processes like imagination, logical inferences and creative problem-solving, whereby also affective and situational factors like vigilance or trust may be in play. This concerns real-life situations and necessarily also behaviours like SIM interview or TPB questionnaire responses.

Thus, it would seem that the attitudes/beliefs which TPB measures and the present CCM data are both situational manifestations of the respondents' retained/recalled conceptual base, "knowledge structures", *and* their transitory mental models and inferences based on both. As usual in social research, the answers and data depend on what is asked and how. In this case TPB statements enable implying the existence/non-existence of a *specific* belief and its strength, CCM and cause maps present a *systemic view* of a person's or group's general phenomenological and causal beliefs about a given domain or issue. The research purposes define which kind of data is relevant.

Lessons for entrepreneurship development.

In general, the NME/SBA counselling in this case appears appropriate and effective. However, the SBAs' information base may depend largely on the NMEs' field/homework, which implies risks of overconfidence, omissions and errors. Furthermore, the present SBA approach emphasizes confirming that the proposed project works now, but not that it functions and that the NME can handle it also in the longer run. However, especially in small business unexpected things often invalidate original ideas and even capable entrepreneurs err. A short term remedy is to ensure and, if possible, develop NMEs' capabilities and to extend using outside experts' knowledge. A better

solution is to extend the NME/SBA cooperation over at least 2 or 3 first years. Solving both issues requires, however, additional FEA resources and more generous entrepreneurship policies.

A moot issue is the apparently light handling of NMEs' fears and their ambiguous beliefs about business failure. Arguably, tackling openly the possibility of failure can be useful even if euphoric NMEs feel no qualms at the outset or do not express them. It counteracts overconfidence (Invernizzi *et al.,* 2017), removes tacit fears and fosters motivation and more careful decision-making (Cacciotti *et al.,* 2016). Moreover, preparing for a failure, having a "Plan B", benefits also the usually very risk-aversive SBAs. They could feel permitted to recommend more ambitious Plan As, knowing that the NME can handle the foreseeable difficulties and has a fall-back position.

Research implications and limitations

Methodologically, the study shows that a relatively uncomplicated approach (CCM) can reveal social actors' individual and shared belief systems. The main limitation is that this is an explorative case study in a specific context with self-selected respondents. This restricts the findings' applicability to the FEA context with the caveat that these NMEs may not be quite representative of FEA's other clients, let alone typical NMEs elsewhere. Thus, the study contributes primarily as an example of cognitive research focused on entrepreneurial actors' belief systems. This, however, can have a wider theoretical and methodological application potential (Whetten, 1989).

As for future research, the study and/or the methodology can be replicated in different contexts, e.g., by using CCM methods to compare different types of NMEs or NMEs with lay persons. The findings about NME's fears suggest new research but also the question could this aspect be included in TPB studies. After all, fear of failure is a major blocking factor in entrepreneurial entry (Jenkins and McKelvie, 2016; Wyrwich, *et al.*, 2016). Lastly, it would be important to explore entrepreneurial actors' cognitions by co-operative projects of cognitive scientists and entrepreneurship researchers (Grégoire *et al.,* 2015; Hisrich *et al.,* 2007; Nicolau *et al*., 2019). This could strengthen the theoretic base and provide more empirical evidence to foster cognitive research in entrepreneurship in general.

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