

Uncovering Entrepreneurial Belief Systems Through Cognitive Causal Mapping

Mauri Laukkanen and Francisco Liñán

Abstract This chapter discusses the grounds and methods of studying the knowledge structures (aka belief systems, cognitive maps, mental models) that underlie and guide entrepreneurs' and entrepreneurial actors' perceptions, intentions, decision-making and performance. Current entrepreneurial cognition research (ECR), largely emulating cognitive psychology, tends to emphasise individual cognitive processes, studying how entrepreneurs in general think and solve problems. This is important but underemphasises the also essential questions of what specific entrepreneurs know and think (or ignore); the contents, formation, relevance and consequences of their knowledge and beliefs. This chapter discusses some basic issues of cognition and the conditions of empirically studying knowledge or beliefs. It also presents an accessible and established method, cognitive comparative causal mapping (CCM), for revealing and analysing entrepreneurs' and entrepreneurial actors' belief systems, demonstrating it in the case of nascent micro entrepreneurs and small business advisors. In international entrepreneurship research, this approach facilitates, e.g., tracking the evolution of entrepreneurs' thinking during internationalisation or comparing their belief systems in different cross-cultural or cross-national contexts. Such research is supported by CMAP3, a CCM specific software, by enabling studies where the data, such as interviews, use different languages, the coding and reporting a standard language like English.

Keywords Comparative cognitive causal mapping · CMAP3 · Belief system · Cognitive map · Mental model · Nascent micro entrepreneurs · Small business advisors · Entrepreneurial cognition research · Cross-cultural/national research

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A. Caputo et al. (eds.), The International Dimension of Entrepreneurial Decision-Making, Contributions to Management Science, https://doi.org/10.1007/978-3-030-85950-3_3 (pp. 37 – 63)

1 Introduction

Entrepreneurial cognition research (ECR) has increased markedly in the 2000s (Baron, 2016; Grégoire et al., 2015). Its target phenomenon has been defined as the knowledge structures used, e.g., in venture creation, the central question as how entrepreneurs think by utilising those structures (Mitchell et al., 2007). As shown by recent reviews (Randolph-Seng et al., 2016), the subfield has so far in fact focused on individual-level process issues like biases, expertise, heuristics and problemsolving, largely emulating clinical-style cognitive psychology only migrated to entrepreneurial contexts. The orientation has produced important results such as the findings about causation and effectuation (Sarasvathy et al., 2007, 2015) or entrepreneurial scripts (Mitchell et al., 2009). The current emphasis has, however, also a downside.

First, the “how” orientation has meant largely overlooking content-related aspects of entrepreneurial knowledge, i.e., what do specific entrepreneurial actors know (or ignore), how accurate (or erroneous) their beliefs are and what impacts that has or how their knowledge evolves. The criticality of action knowledge is evident. For instance, expert entrepreneurs seem to develop a general problem-solving approach called effectuation for evaluating ventures (Sarasvathy et al., 2007). Such a decisionmaking and the actual ventures, however, occur in specific operative and strategic contexts of entities, states of affairs and their mechanisms. Founding a firm and managing it requires internalising and understanding at least that context’s critical aspects by gradually developing and maintaining corresponding context-isomorphic, action-relevant knowledge or belief systems. This applies to all fields where individuals’ or teams role is essential. Therefore, studying the beliefs of key actors has long been central, e.g., in political science and management and organisation cognition (MOC) (cf. Axelrod, 1976; Gary & Wood, 2011; Narayanan, 2005; Schraven et al., 2015; Walsh, 1995). Considering the similarities of cognitive demands placed by entrepreneurship and management, the same orientation seems relevant also in entrepreneurial contexts.

Second, the prevalent “how” orientation can breed misconceptions that ECR always requires the clinical-experimental methods of cognitive psychology (Baron & Ward, 2004; Evans, 1998; Gentner, 2004), verbal protocols of expertise studies (Chi, 2006; Grégoire & Lambert, 2015), even neuroscientific techniques (Fiske & Taylor, 2021; Morrison & Knowlton, 2012). Whilst appropriate in process-oriented studies, such methods are not accessible to many entrepreneurship researchers. Therefore, it is important to see that ECR can also be about what entrepreneurs think, i.e., entrepreneurial knowledge and beliefs. This means studying, e.g., what nascent, serial or successful or failed entrepreneurs or their stakeholders know or do not know about key issues or how certain events or interventions influence their thought patterns. Importantly, such research is practicable with normally accessible methods. This chapter aims to demonstrate this.

To do so, let us assume a study of finding out what nascent micro entrepreneurs and their counsellors in three European countries believe are the causes and consequences of individual entrepreneurship and of micro firms’ success or failure. This raises two questions which this chapter can hopefully answer. First, why such studies? Theoretically, studying entrepreneurial actors’ beliefs helps understand the so far largely neglected cognitive underpinnings of entrepreneurship and related mechanisms (Krueger, 2007; Liñán & Fayolle, 2015). This calls for more respective research in different contexts. In pragmatic and policy terms, the need of studying new venture counselling is evident, too. Whilst widespread (Rotger et al., 2012), such programmes’ effectiveness is not obvious (Ratinho et al., 2020). For instance, some researchers emphasise the need for counsellors to empathise with their clients and to adapt the interventions to their beliefs (Nielsen & Klyver, 2020). That, however, requires understanding what the counsellors and their clients think about entrepreneurship and starting ventures. Furthermore, their beliefs reflect different national or cultural contexts (Welter, 2011). For instance, if it is common in a region to think that entrepreneurship is individually and socially rewarding, or conversely, that it is risky or something shunned by the dominant culture, that will be manifested in that region’s level of entrepreneurship and economic and social well-being. Thus, this research can increase our understanding of counsellor-client relationships, perhaps especially in cross-cultural studies.

The second question is how to reveal someone’s beliefs or theoretical notions like knowledge structures such as mental models? Different solutions have been discussed in the literature (cf., Chi, 2006; Evans, 1998; Gentner, 2004; Ifenthaler et al., 2011; Rouse & Morris, 1986). Their shared point of departure is that

knowledge or beliefs cannot be observed directly nor elicited independent of the person. Neuroscientific techniques like functional magnetic resonance imaging (fMRI, Morrison & Knowlton, 2012) enable studying brain activities and related issues, which can be important also in entrepreneurship (Nicolaou et al., 2019). However, whilst such methods can show, e.g., that causal thinking engages the lateral prefrontal cortex, they cannot reveal exactly what the person knows or thinks about something (Khemlani et al., 2014). That must be inferred of communications usually in the form of documents, interview responses or questionnaires. This chapter discusses one such method, comparative cognitive causal mapping (CCM). Variants of cognitive mapping (Laukkanen & Wang, 2015) have been long used in fields like MOC and IT (Furnari, 2015; Narayanan, 2005), political science (Axelrod, 1976), environmental studies (Jones et al., 2011) and increasingly also in entrepreneurship (e.g. Laukkanen & Tornikoski, 2018; Lima & da Silva Müller, 2017; Schulte-Holthaus & Kuckertz, 2020; Tremml, 2020). We present two CCM studies, one of nascent micro entrepreneurs (NME), the other of small business advisors (SBAs). This facilitates assessing CCM's applicability for studying entrepreneurial actors' knowledge in general and in cross-cultural and crossnational contexts.

The chapter is structured as follows. We discuss next basic notions about human cognition and their methodological implications. The third section describes the study's context and methods. The fourth presents the findings about the SBAs' and NMEs' belief systems and discusses a survey conducted to test the method. The last section draws some methodological and research lessons for content-oriented ECR considering especially cross-cultural and cross-national contexts.

2 Conceptual and Methodological Underpinnings

2.1 *Mental Models and Reasoning*

Memory is a key aspect of cognitive functioning (Baddeley, 2010; Evans & Stanovich, 2013; Fiske & Taylor, 2021). It is usually conceptualised to consist of a long-term memory (LTM), a permanent information store with practically unlimited capacity, and a short-term or working memory (WM), a temporary information storage and conscious processing system. WM's capacity is limited, typically to 4–5 words/episodes and 5–7 numbers at a time.

Underlying the notions of knowledge and belief¹ is our ability of symbolic representation: the creation, acquisition and use of internal conceptions or models of our external reality. This notion is common in cognitive and social psychology and in fields like management and organisation cognition (MOC) and political science/psychology (Axelrod, 1976; Johnson-Laird, 2004, 2013; Markman & Gentner, 2001; Narayanan, 2005; Walsh, 1995). This is manifested in theoretical constructs that denote different hypothesised knowledge structures (schemas) (Fiske & Taylor, 2021). These include scripts (prototypical processes or event sequences) (Mitchell et al., 2009), folk/naïve theories (lay systems of belief) (Gelman & Legare, 2011) and mental models and/or belief systems (Bandura, 2001; Gentner, 2004; Johnson-Laird, 2010, 2013; Markman & Gentner, 2001). The latter terms refer to a person's more or less coherent interrelated beliefs/knowledge about a domain or issue, retained in LTM and augmented or generated in the WM using momentary reasoning and imagination. The term cognitive map denotes usually spatial objects' representations (Fiske & Taylor, 2021), sometimes also structures like mental models, but in applied studies also their overt representations like cause maps or most confusingly both aspects.

Mental models/belief systems are practically indispensable. When recalled or created ad hoc in WM, they enable the person discerning what exists in a given part of the world, comprehending how things function and running thought experiments using fast, mind's eye, "kinematic simulation of the world" (Hagmayer &

¹ The terms knowledge and belief are used now interchangeably to refer to social actors' subjective knowledge, in practice propositions they hold and consider plausible enough to express as their views (Good & McDowell, 2015; cf. however, e.g., Churchland & Churchland, 2013).

Sloman, 2009; Johnson-Laird, 2013). This facilitates mentally intervening in perceived real or hypothetical situations by if-then inferences and thus flexible reasoning and comprehending about past, novel or even imaginary events and issues. This is also a precondition of conceiving and planning of alternative courses of action, i.e., subjectively reasoned behaviour (Baumeister et al., 2011).

2.2 Origins of Knowledge and Beliefs

Understanding and influencing entrepreneurial knowledge requires understanding their origins. This involves first experiential learning based on observing and inferring events' co-occurrences and the consequences of one's own or others' behaviours (Cheng & Buehner, 2012; Holyoak & Cheng, 2011). Some beliefs result of intense experiences like growing in an entrepreneur family, leaving long-lasting beliefs about entrepreneurship as something rewarding or precarious. The other major source is social transfer by gradual cultural indoctrination, basic and professional education and working life knowledge transmission (Chi & Ohlsson, 2005; Wyer & Albarracín, 2005). Influential can be also the "common knowledge" conveyed by media and social arenas and the area-specific knowledge obtained of different guides and professional training and counselling (Forbes, 2014). Overall, social transfer typically explains most of people's active beliefs and knowledge (Chi & Ohlsson, 2005). Lastly, there are also cognitive processes whereby people unconsciously acquire higher level, often tacit knowledge (Chi & Ohlsson, 2005).

A different question is the specific knowledge/beliefs people acquire especially considering the huge amount of all potential knowledge. This and the largely automatic selection can be understood functionally. Knowledge people consider (or define) relevant to a task, situation or position, tends to be acquired, and conversely, bypassed if found unnecessary. Some knowledge will be generated and retained as a by-product of everyday problem-solving, some gets adopted resulting of strong evidence or social pressures. The outcome is that normal adults will possess large repositories (Chi & Ohlsson, 2005) of distinct items and systems of knowledge varying in terms of generality, veridicality and accessibility (tacit/ explicit) concerning mainly things, issues and domains that are important to the individual. At social levels especially within organisations and professions, such processes can produce communities of practice (cf. Pyrko et al., 2017), characterised by unique belief systems. For example, the present SBAs who meet regularly and share training, information and experiences, probably form such a community.

Lastly, belief formation underlies cognitive tendencies and biases, although their impact in specific cases like the present respondents can be only surmised. An important common tendency is normal adults' in-built need to explain and to understand other people and the own world by finding plausible, not necessarily true causes or reasons for behaviour and events (Fiske & Taylor, 2021; Sloman & Lagnado, 2015). This is manifested in people's inherent or cultural (Bender et al., 2017) tendencies (Westmeyer, 2001) to explain behaviours and outcomes teleologically or functionally by referring to others' motives or to phenomena's functions, tautologically by assuming people have unique faculties, and environmentally by positing compelling conditions and factors. In the present case, such tendencies or perhaps explanatory heuristics could underlie especially beliefs (propositions) which the respondents express as tentative ideas. A second factor concerning especially the NMEs is our tendency to avoid cognitive dissonance (Fiske & Taylor, 2021; Sternberg & Sternberg, 2012). This is shown in resisting changing one's mind or in ignoring information that contradicts one's previous beliefs and decisions, in general in an inclination to believe what one wishes. Further, also presently probably relevant propensities include the confirmation bias to prioritise evidence that supports previous beliefs, an illusion of control and an optimistic bias (Baron, 2004).

2.3 Methodological Implications

The notion of mental models/belief systems implies that their key elements are causal beliefs/propositions that certain phenomena or states of affairs (A, B, C, etc.) exist and have some influence (or temporal) relationships (that A influences B, C follows B, etc.) (Sloman & Lagnado, 2015). Cause maps (see below) consist of nodes and arrows that correspond to the entities and relationships someone perceives in a domain. This makes causal

mapping a highly useful formality for representing actors' phenomenological and causal beliefs and their systems, including conceived event sequences (scripts) (Ifenthaler et al., 2011; Jones et al., 2011).

Using causal maps underlies some constraints. First, as noted, knowledge/beliefs and their systems must be externalised in natural language or graphically before they can be analysed and interpreted (Evans, 1998; Ifenthaler et al., 2011; Rouse & Morris, 1986). Second, people have no single universal belief system/mental model, but several variously coherent and developed conceptualisations about specific issues or domains. This implies a researcher decision about which issues are relevant and focusing data elicitation accordingly. Third, belief systems cannot be expressed nor elicited as whole gestalts. When probed, people can express beliefs only as successive binary propositions (a ! b, c ! d, etc.), which correspond to what they recall and/or infer based on the recalled knowledge.

The construction of cause maps depends on the data. In archival CCM studies the data, causal propositions, are distilled from texts usually from among much irrelevant material (Axelrod, 1976). In the present case the original propositions had to be elicited by semi-structured interviewing (SSI) (Laukkanen & Wang, 2015). This has the additional benefit of acquiring mainly causal proposition and little redundant data. In cognitive terms, SSI probing activates the declarative LTM which contains retained facts and general notions like concepts, principles, ideas and theories (Baddeley, 2010; Chi & Ohlsson, 2005). Probing usually also triggers WM reconstruction using mental simulation, imagination and logical reasoning (JohnsonLaird, 2010, 2013). It follows that respondents may occasionally utter also things which do not exist in their LTM and might not occur to them when probed again. This must be observed in the study's instructions, uniform elicitation times and data interpretation.

As described below, in CCM, the original propositions are combined, after coding, first into individual cause maps (ICM), representing each respondent's belief systems. By intersecting the ICMs aggregated cause maps (ACM) can be constructed to represent the respondents' shared, typical belief patterns. Using ACMs also helps neutralise the impact of idiosyncrasies and random factors. It is, however, important not to overinterpret cause maps by assuming they are 1:1 replicas of mental models. This follows already of WM limitations (Leiser, 2001). However, when based on valid data elicited from properly instructed and sincere respondents, cause maps are very useful representations of actors' typical beliefs and reasoning patterns about the addressed domains at a given time.

2.4 Research Tasks and Expectations

Assessing the CCM approach involves a practical and a plausibility issue. The former varies by each researcher and study case. The latter means that the method and the findings make sense and conform to basic theory-based expectations.

Perhaps the first expectation is that both respondent groups do have more or less shared belief systems. This follows of belief systems' key role and formation logic as discussed above. A test of this expectation is whether plausible, coherent ACMs can be generated. That is not possible if the belief systems are so divergent that the elicited ICMs have only few shared notions and causal relationships.

Further expectations concern the respondents' belief systems' complexity and within-group congruence, manifested in a higher or smaller number of cause map nodes and causal relationships and more or less complex ACMs. In this respect, it can be assumed that the SBAs' belief systems and thus ACM will be more uniform and complex than those of the NMEs. This follows of the SBAs' business education, counselling experience and characteristics as a community of practice.

The NMEs' belief systems and ACM are more difficult to predict. Their educational and work-life backgrounds, personal situations and objectives vary. In general, it can be assumed that, as lay persons, their shared knowledge/beliefs will reflect, in addition to the above discussed cultural tendencies, also socially shared, common-sense ideas about entrepreneurship. On theoretical grounds (cognitive dissonance), their ideas about entrepreneurship should be sanguine, emphasising entrepreneurship's positive outcomes and feasibility. Otherwise, they would hardly be seeking counselling. A further factor is that the NMEs have no entrepreneurial

experience, yet are seriously considering an entrepreneurial career. Thus, their belief systems about micro firms are less sophisticated and more divergent, suggesting simple ACMs. It is also likely that they have thought about entrepreneurship and sought related information. This suggests rudimentary but still diverse ideas about entrepreneurship and managing a business, also implying less uniform and simpler belief systems and thus a relatively simple ACM.

3 Context, Respondents, Method

3.1 Context and Participants

We present the CCM methodology using two recent study cases. In both, the context is Finnish Entrepreneurship Agency (FEA), the country's only nationwide provider of micro entrepreneur advisory services. Currently, there are 29 local agencies which employ some 90 SBAs, supported by voluntary local experts. In a typical year, FEA has around 15,000 clients and helps found 8000 firms, which corresponds to one half of Finland's early-stage entrepreneurs and one third of new firms. SBAs evaluate prospective entrepreneurs' business ideas and qualifications, offering no-cost advice whether and how to realise the project. They also provide contacts and endorsements about start-up allowances or loans. Currently only the start-up phase is covered.

The SBA sample (N = 15) was constructed by randomly selecting local FEA units and then inviting the manager SBA and one further SBA (if available) to participate. The sample includes 6 females and 9 males and was built stage-wise, observing active concepts' saturation (see below). The SBAs' mean age was 45.3 years (SD 8.76). They have worked long as SBAs (7.9 years SD 6.24). Most have an MSc and also several years' experience as owner-managers or in family business.

The NMEs are clients of two FEA agencies. As FEA cannot disclose client information, the participation had to be voluntary. The criterion was that they had not yet started the actual counselling so that the interviews would reflect their pre-founding beliefs. The NME sample too was based on tracking the saturation of their active concepts. The final sample (N = 13) included 8 female and 5 male participants. Their mean age was 44.1 years (SD 10.24) with a range of 27–57 years. Six NMEs have a university, five a polytechnic and two a trade school degree, a somewhat higher level compared with GEM studies' NMEs (Suomalainen et al., 2016).

3.2 Comparative Causal Mapping

The CCM method is discussed in Laukkanen (2018) and in detail in Laukkanen and Wang (2015). The main stages (Fig. 1) can be summarised as follows. The data, original causal propositions, were acquired using semi-structured interviewing (SSI) around two anchor topics: (1) Why does (or does not) someone become an entrepreneur and what follows? and (2) What are the causes and consequences of a micro firm's emergence and success or failure? As noted, a focusing of respondents' thinking and responses is necessary to elicit beliefs about the relevant domain, in this case, individual entrepreneurship and small firms' performance.

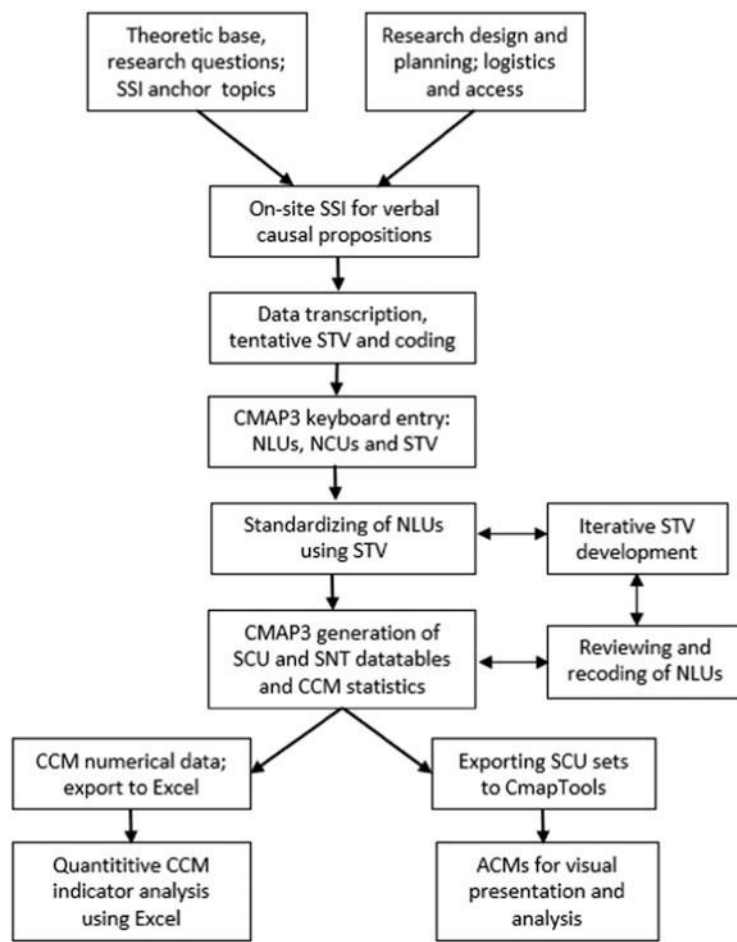


Fig. 1 Main stages of the CCM-SSI research process (For the abbreviations, please see the text)

Before starting, the SSI process was explained. It was emphasised that the respondents' own ideas, not "book wisdom", are sought and that no sensitive issues will be addressed. SSI started by asking first about the causes of the first anchor topic and then about its consequences. This produces a first layer of original notions and causal propositions, more familiar and easily recalled as the topic's proximate causes and effects. Then the same format was repeated using the elicited original concepts as new anchors. This generates a much larger secondary layer of concepts, causally more distant but still representing the respondents' retained beliefs and causal inferences. Because of the limited access time and the need to cover both domains consistently, the present SSI probed only about the antecedents of the primary causes and the consequents of the primary effects. When the first topic was covered and the respondent had not anything to add, the second anchor topic was addressed similarly. The allotted response times were kept uniform. The SBA interviews took a good hour ($M = 80.0$ min, $SD = 16.9$), the NMEs' duration was $M = 66.77$ min ($SD = 13.99$). The interviewer kept handwritten notes (see Laukkanen & Wang, 2015), backed by voice-activated recording (with permission).

As noted earlier, CCM-SSI data consist of causal propositions, i.e., concept pairs ($a \rightarrow b$, $b \rightarrow c$, etc.), where a notion, or rather its referent phenomenon, is stated to influence another notion or to be caused by it. The SBA data contained 1153 original concepts ($M = 76.87$, $SD = 19.14$ per respondent), called natural language units (NLU) and 1539 causal relationships, called, respectively, natural causal units (NCU) ($M = 102.60$, $SD = 28.10$ per respondent). NME data contained 923 NLUs ($M = 71.00$, $SD = 16.49$ per respondent) and 1312 NCUs ($M = 100.92$, $SD = 21.69$ per respondent).

The studies utilised a CCM specific application, CMAP3.² Natural language data, typical of SSI-CCM studies, makes this obligatory (cf. Haak et al., 2013). In practice, original data are keyboard entered into CMAP3, coded/standardised and processed to create the base for graphic cause maps and the numerical data which represent the respondents' belief systems and enable their visual and numerical analysis. The technical processes are explained in Laukkanen and Wang (2015) and in CMAP3 support documentation (Footnote 2).

A key step in CCM is standardising (coding) (Laukkanen & Wang, 2015). It converts the respondents' uttered concepts (now in Finnish) into standard terms (in English) which represent the underlying core meanings and referents. Usually, standard terms are developed iteratively by grouping and inferring of the original concepts and entered into a CMAP3 data table called standard term vocabulary (STV). In practice, standardising interprets the original concepts' meanings and defines them as same-denoting with an appropriate standard term. This also compacts data by identifying synonyms and homonyms and removing (presently) redundant details like polar states or attributes. Most importantly, standardising facilitates converting the NLUs into the STV's standard language and enables thus comparing the respondents' beliefs and defining their similarity or difference.

The present coding was at low level, where the standard terms are close to the original concepts. This simplifies coding and makes it more reliable compared with studies using higher-level standard terms. Because standardising influences the results of CCM, it must be done carefully ensuring its validity, e.g., by using external reviewers (see below).

A key feature of CMAP3 is that the NLUs and the STV reside in separate data tables and that the STV allows two parallel languages. This means that the original data and the STV can (but must not) be in different languages. This is important in cross-national studies (see Footnote 2) and generally in studies where the raw data like interview responses and the reporting must use different languages. The technique facilitates also validating the individual standardising decisions using respondent feedback (Laukkanen & Wang, 2015).

After coding, the original data were processed by CMAP3 into data tables, one containing active standard concepts (SNT, standard node terms), the other standardised cause-effect links or pairs, called standard causal units (SCU). The process also determines which respondents own a given SNT and SCU; that is, had expressed the corresponding original concepts and causal propositions. The incidence information also enables distilling a respondent's or a group's active standard causal links, which can be then converted into pictorial ICMs or ACMs by exporting the SCU sets to a graphic application like IHMC CmapTools³ or MS PowerPoint (Laukkanen & Wang, 2015). CMAP3 also calculates numerical indicators like densities and mutual distances of the ICMs. These as the above data tables can be exported to MS Excel for further analysis and printing.

3.3 *Validity*

In CCM—in qualitative studies generally—validity can be defined as the method's and the findings' credibility (Maxwell, 2013). In this case, at issue is did the SSI tap and do the emerging ACMs represent the respondents' typical beliefs and inference tendencies. Three aspects can be considered.

The first is data validity. Here it depends primarily on the respondents' sincerity (Axelrod, 1976): Did they say what they think and mean what they say? This can only be judged by examining the specific method and the context (Nicolini, 1999). The interviews were conducted in neutral, topic-relevant surroundings (FEA offices) following a standard protocol and allowing roughly equal response times. Importantly, the probing addressed general, not personal issues. The participants had also no obvious shared motives nor a practical possibility to collude so as to systematically bias, hide or fabricate what they all express. Thus, important indirect evidence of the studies' validity is that coherent, relatively detailed ACMs could be generated because this indicates shared belief systems. Otherwise, ACMs cannot emerge. In addition, ACMs reduce the impact

² CMAP3 installation file, the CCM/CMAP3 User Guide and support documents can be downloaded without cost at the University of Eastern Finland website: <https://www3.uef.fi/fi/web/cmap>. Setting up CMAP3 installs automatically two testable learning projects, the default project representing a fictional cross-national CCM study.

³ IHMC CmapTools can be freely downloaded at: <https://cmap.ihmc.us/cmaptools/cmaptoolsdownload/>

of random errors and idiosyncratic biases. Overall, the present data can be assumed to reflect the participants' sincere, readily accessible knowledge and reasoning tendencies.

The second issue is coding. The ideal is reasonable semantic validity whereby the standard terms (in English) make sense in the context and the original concepts (here in Finnish) are consistently standardised and translated observing their original referents. To assess this, both studies' coding was reviewed by two experts, familiar with the method and the context (an SME professor, an experienced outsider SBA).

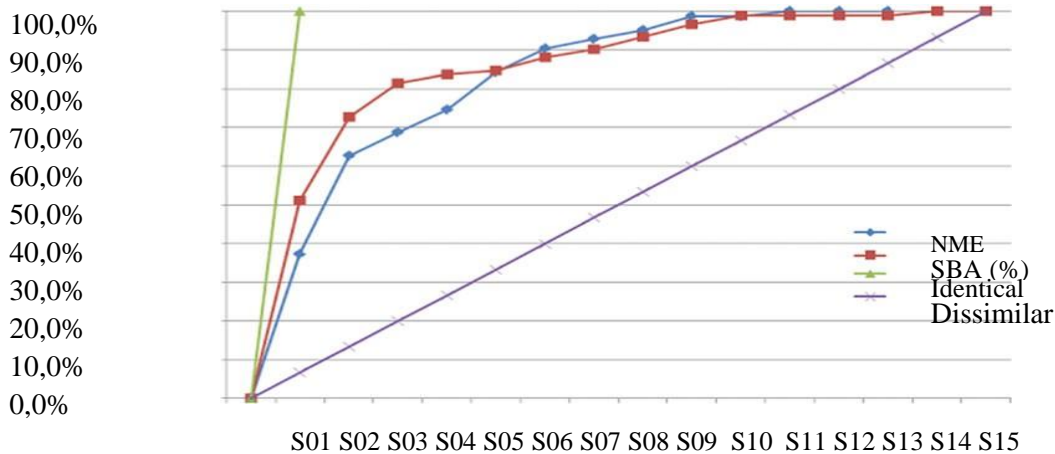


Fig. 2 Saturation of the SBAs' (N = 15) and the NMEs' (N = 13) active standard concepts

This led to some corrections, yet yielded a high inter-rater reliability (IRR) measured as average percent agreement (NME IRR = 99.42%, SBA IRR = 98.51%). This indicates essentially correct coding and high semantic validity.

Lastly, the credibility of causal maps (and mapping) implies reasonable behavioural congruence of the respondents' expressed beliefs and what they do (Axelrod, 1976). If so, cause maps correspond to and make understandable what the studied actors did or enable predicting their corresponding behaviours. When assessing this, the spheres (speech, overt action) must be comparable, i.e., at the same level of specificity and reasonably proximate in time. In this case, the broad congruence was tested by comparing the elicited core beliefs with what happens in NME/SBA counselling. The results are discussed below.

4 Findings

4.1 Examining Belief Systems' Sharedness

As noted, the first expectation concerned the studied groups' beliefs' homogeneity, indicated by the saturation of the respondents' concepts (Nelson et al., 2000). As shown in Fig. 2, the majority of their active concepts emerge already by the 7th respondent in both groups. After this, each additional participant contributes only 1 or 2 new concepts. As causal links follow the concepts, this indicates that the SBAs' and NMEs' belief systems concerning the inquired issues are relatively uniform.

The observed saturation serves also constructing the ACMs which represent the respondents' typical or core thought patterns. Technically, ACMs are intersections of ICMs and contain the standard nodes and causal relationships which a specific number of the group's members share. Causal mapping literature suggests a criterion of around 50% (Carley, 1997). In general, the threshold depends on how uniformly the groups think about the focal issue (Guest et al., 2006). In this case, the observed saturation pattern and the 50% rule both suggest cut-off points of N 6 or N 7. However, the ACMs must also present the participants' core thinking in a practical and comprehensible form. Using CMAP3, this could be tested by generating ACMs using different

thresholds. This showed for both groups that $N \Rightarrow 6$ produces too dense, poorly readable ACMs, a high threshold ($N \Rightarrow 8$), respectively, simple ACMs, which risk excluding probably shared notions. $N = 7$ appeared a good compromise. This is also indicated by the high sharedness of ACMs' nodes (measured by their total frequency, TF, the number of respondents owning a standard concept). The SBA ACM's (Fig. 3) median TF = 8.0; the NME ACM (Fig. 4) median TF = 9.0.

4.2 SBA Belief System

The first ACM (Fig. 3) represents the SBAs' core belief systems about the causes and consequences of nascent micro firms' (NMF) emergence and success and failure. It contains 58 nodes and 114 causal links, some reciprocal. The nodes in bold are shared by nearly all SBAs.

This ACM is relatively complex, indicating sophisticated typical thinking. The left side displays the main factors of NMF success or failure as perceived by the SBAs. There are two primary mechanisms. One concerns the NMEs' business, manifested first in a business idea (BI) or a business plan (BP). The SBAs emphasise demand, "paying customers", the proposed business's competitiveness v. local competition, and the NMEs' resources' adequacy and their BPs' quality. In general, the factors SBAs observe are symmetrical and continuous, different states having a positive or negative impact on the outcome.

The second subsystem concerns NMEs' characteristics. The SBAs discern several background factors shown in the ACM. A specific one explaining especially failure is the standard notion NMEs' negative attitudes/traits. It summarises characteristics which the SBAs have encountered and consider problematic such as strong introversion, laziness, unconscientiousness and alcohol or moral problems.

Two further observations are noteworthy. First, the ACM indicates that the SBA emphasises the negative consequences of an entrepreneurial failure, suggesting an inherent tendency to avert risks as far as possible. Second, the SBAs emphasise the positive societal consequences of NMFs (and thus of midwifing them) but seem unaware of their potential and common negative impacts like causing local firm and job churning (Bennett, 2014).

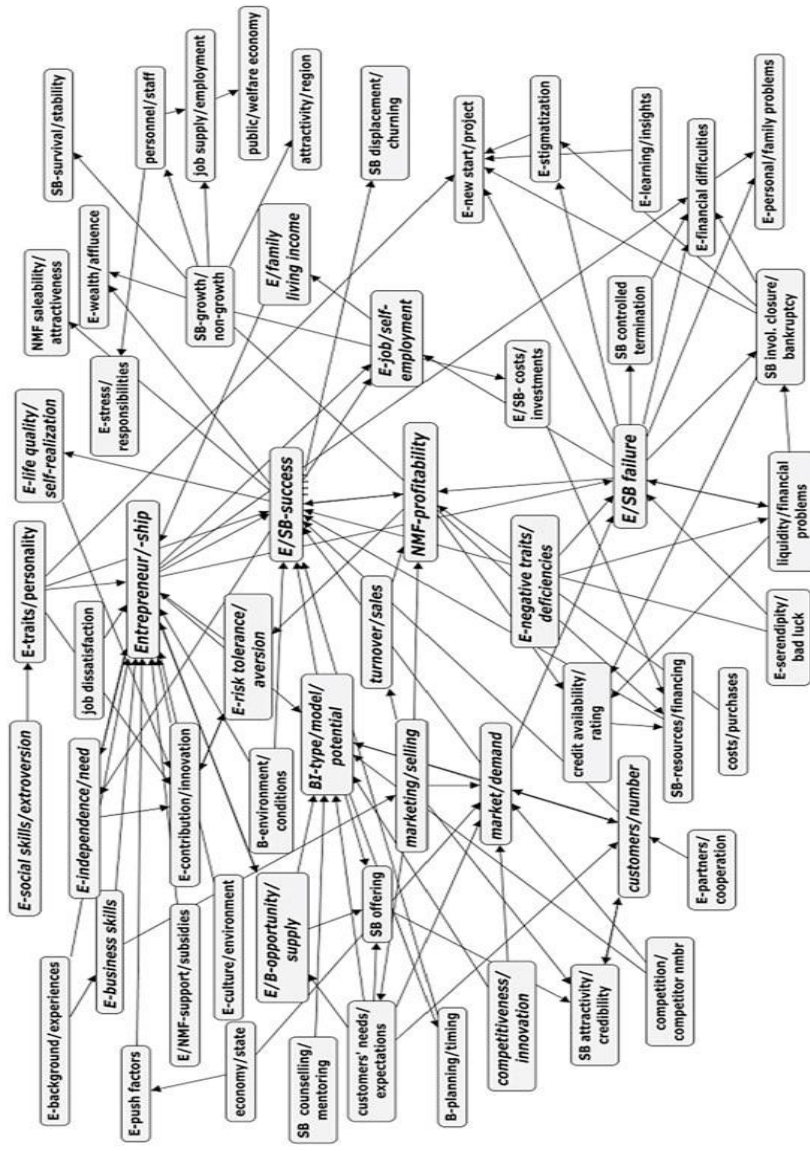


Fig.3 The SBAs' aggregated cause map

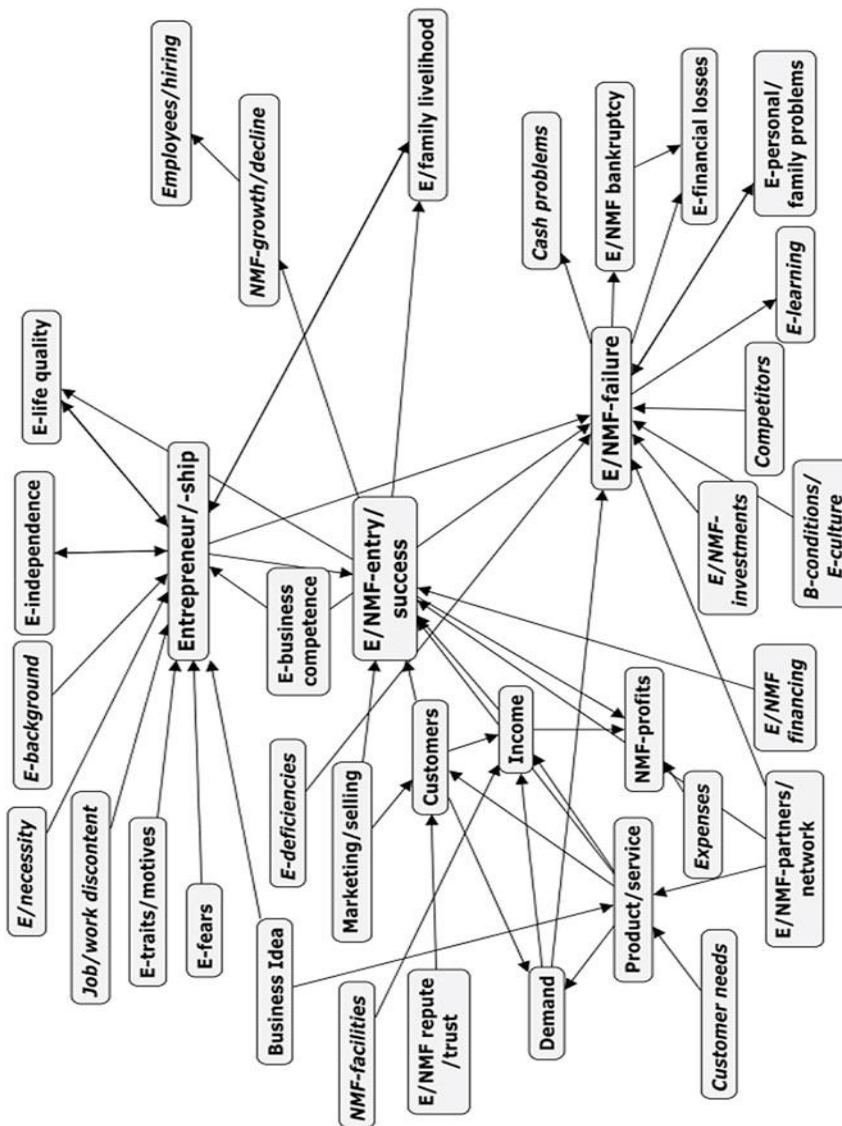


Fig.4 The NMEs' aggregated cause map

4.3 NME Belief System

The second ACM (Fig. 4) summarises the NME's entrepreneurship—and business-related beliefs. It contains 37 standard concepts and 56 relationships, some reciprocal, a concept appearing as a factor and an outcome. The concepts in bold are shared by all NMEs.

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 realises those, which is why they appear as drivers and outcomes. The NMEs also believe that there are specific traits and motives that differentiate entrepreneurs from "normal" persons. Second, NMEs have several beliefs concerning entrepreneurship's business aspects. They note that a Business Idea (BI), an accessible product or service or a detected need can trigger entrepreneurship, and that entrepreneurship requires certain competences about which their ideas, however, are hazier. Notably, to most NMEs the reason preventing entrepreneurship is fears of the consequences of a failure and of the uncertainty of being able to launch and run an NMF. Interestingly, this aspect did not come up in any SBA interview. Therefore, it is missing in the SBAs' ACM.

The ACM's middle part displays NMEs' core beliefs about NMF success. They explain it by an active, competent entrepreneur and a product/service which corresponds to customer needs, attracts customers and has partner network support. To influence customers, NMEs emphasise marketing, personal selling and reputation. As outcomes, ensuring livelihood and better life quality are mentioned again. More distant results

include firm growth, hiring personnel and ability to provide jobs and support public welfare. Notably, stereotypic motives like wealth or social status do not appear in the ACM, only two NMEs noting them. Perhaps such things are perceived more hypothetical at this early stage.

The NME ACM's dense subsystem about NMF failure suggests that too they consider this a serious issue. They perceive several failure causes. Interestingly, nearly all NMEs believe that failure always means bankruptcy, leading to major losses and serious personal and family problems. The normal unforced termination seems unknown. However, the NMEs are remarkably euphoric: Failure can happen but not to one, but should it happen, one can return to a wage-earning job or restart having learned much. This may indicate the common avoidance of cognitive dissonance, here between intentions and perceived risks. At this stage, it is perhaps natural to diminish the dissonance by mentally minimising the latter.

4.4 Correspondence of Beliefs and Behaviours

To assess the congruence of the two groups' belief systems and respective behaviours, a brief SBA survey⁴ (N = 15) was conducted to illuminate the foci and conduct of typical FEA counselling sessions. As evidence, this is asymmetric but unavoidable. The SBAs have counselling experience, the NMEs none. It seems, however, reasonable to assume that the NMEs' main concerns will be manifested in the SBAs' responses.

The ACM simply two, possibly three foci in typical counselling. The first concerns the NME's proposed business and personal goals. These are essential but largely neutral issues. For the NMEs, they mean entrepreneurship's preconditions; for the SBAs things they meet daily and which they are, by definition, prepared to handle. The other is NMEs' qualifications. Whilst the NMEs understand qualifications' significance, they can seldom assess their own capabilities relative to their projects. As for the SBAs, although they emphasise NME competence and characteristics, assessing them is difficult. The SBA belief system reflects this: the ACM contains things for which information is easily available and/or which concern observable characteristics like extraversion or consciousness, inferable (not necessarily accurately) from the NMEs' behaviours. The third but problematic issue is NMEs' fears, salient in the NME ACM but missing in the SBA ACM. The asymmetry suggests that NMEs' qualms are probably seldom actively tackled.

The survey broadly supports the above predictions. The SBAs emphasise the realism of proposed business, seeking evidence of a plausible business and revenue logic. They also examine NMEs' resources. As to NME capabilities, the SBAs emphasise personality, "a good E-type" with overt signs of motivation and drive, knowledge of the business and customers and appropriate skills. The NMEs' business plans are key tools of the SBAs. They facilitate concrete, numerical assessment and indicate the NMEs' communication, conscientiousness and mental capabilities.

The SBAs were specifically asked about NMEs' fears. The responses indicate that these issues come up rarely. The majority think that eventual qualms vanish automatically when the NMEs grasp their projects' practical realisability. Another approach, more typical of female SBAs, provides sympathetic listening, advice and encouragement. Two SBAs denied the existence of fears as "unentrepreneurial". Overall, it can be assumed that most SBAs would not refuse discussing a client's fears if the client wishes that and specifically expresses them. That, however, seems unusual in the present context. Why this is so and which counselling strategies make sense are interesting questions for further research.

⁴ This SBA sample was randomly selected and invited to respond to an emailed open questionnaire. The sample followed a saturation logic, approaching new respondents till no essentially new notions emerged. This point was reached by N ¼ 15. The SBAs' mean age was 54.50 (SD 7.82), average SBA-experience 17.08 years (SD 9.12) and business experience 20.69 years (SD 12.22). 10 had an MSc, 4 a Polytechnic (BBA) degree, 1 undefined.

5 Discussion

This section examines first the belief systems considering the theory-based expectations. It then discusses the CCM methodology and its variants and use in crosscultural and cross-national studies. We conclude by some lessons of the study cases and suggest some directions for further CCM studies.

5.1 *Evaluating the Findings*

A first conclusion is that both respondent groups have shared beliefs systems as expected. This is indicated by the congruence of both groups' active concept bases and by the emergence of coherent ACMs when intersecting the respondents' ICMs. Second, the belief systems' overall complexity is also as predicted, the SBA ACM indicating clearly more sophisticated thinking about the probed issues compared with the NMEs. Such observations may seem now self-evident, but this is hindsight. At the outset they could be only surmised.

Second, the two groups' belief systems' contents provide persuasive evidence of the basic formation logic of practical knowledge. To behave intelligently, social actors must internalise and gradually develop their understanding of their external situations' structures and causal mechanisms. Thus, the SBA ACM indicates a rather detailed cognitive grip of things which are normally germane when counselling NMEs and assessing their projects, largely corresponding to established wisdom about small business and entrepreneurship. On the other hand, the SBAs seem to emphasise things of which information is readily available such as the NMEs' business plans. They may also overstress stereotypic ideas about the role of entrepreneurial personality and overt characteristics like extraversion or consciousness, found to predict entrepreneurial performance only moderately (Zhao et al., 2010). Furthermore, the SBA ACM indicates considerable risk aversion and also unawareness (or routine bypassing) of new micro firms' occasional negative consequences (Bennett, 2014). Such tendencies cannot but influence their inferences and recommendations. However, it should also be noted that the SBAs must prioritise the NMEs', not public, interests and that they have only few hours per client and must use mainly information the NMEs provide.

The NME ACM indicates surprisingly uniform and rather complex shared belief systems. This is unexpected considering that the respondents are lay persons with diverse and "non-entrepreneurial" backgrounds. The system of core beliefs can be assumed to reflect the cognitive impact of the similarities of their objectives and personal situations. It also probable that there has been some self-education using similar, readily available printed and digital materials, which reproduce received wisdom about small business and entrepreneurship. Thus, it is not surprising that the two groups' belief systems indeed partly overlap, which should facilitate constructive counselling. However, the NMEs' grasp of business terminology, processes and conditions is still embryonic, understandable at this stage.

To provide further evidence of the SSI-CCM approach, the SBA survey was conducted. The results indicate basic congruence of the respondents' counselling behaviours and their belief systems. The salient exception is NMEs' fears, prominent in their ACM but missing the SBA ACM. This could have reasons like unpreparedness to handle such problems or simply lack of time, but also cognitive, affective or cultural grounds like common stereotypic ideas about "proper" entrepreneurial behaviour. Methodologically, this observation emphasises that even strong beliefs are not always manifested in overt behaviours if the context or common cultural factors are against it. Reasoned action must observe and balance the actors' other beliefs and their subjective perceptions of the situation's demands.

5.2 *Assessing the Methodology*

According to Carley and Palmquist (1992: 605), "Cognitive mapping is perhaps the most useful means of exploring the nature of shared knowledge in social groups". The above studies demonstrate that CCM-SSI facilitates accessing, describing and analysing the typical belief systems of entrepreneurial actors like the SBAs

and NMEs. The methodology is also applicable in different contexts, including settings involving different languages.

In practical terms, the cases show that CCM-SSI is similar to typical qualitative methods. It uses on-site acquisition of natural language data which require subjective interpretation and thus independent verification in some form. On the other hand, the method is not overly demanding in terms of technical know-how, resources and logistics. Importantly, the time per respondent required for data elicitation, processing and analysis is reasonable. For instance, the NME interviews took typically a good hour yet elicited rather detailed ICMs about two key domains. The downside is that systematic and transparent data processing is more or less requires using software like CMAP3. However, this also generates numerical data for “counting the countable”, important in qualitative studies (Cassell & Symon, 1994; Maxwell, 2010). In addition, the data tables can be exported to Excel for advanced quantitative analysis and further, e.g., to SPSS for cluster analysis (Laukkanen & Wang, 2015).

What alternatives to present approach are there for comparative studies of belief systems? This depends on the question. The above studies’ question is essentially: What are group A’s, B’s, etc., beliefs about X? This necessitates uniform acquisition of original causal propositions about the focal topics. That effectively eliminates using less controllable off-site elicitation and also structured approaches like the concept-pool method (Laukkanen & Wang, 2015; Markóczy, 2000), where the elicited concepts are researcher-defined. Conceivable on-site options for eliciting rich original data include text-writing tasks (Nadkarni & Narayanan, 2005) and low-structured interviewing (Nicolini, 1999). Their problem is that they require time or can tap only a restricted set of beliefs. Further issues can be ensuring uniformity and eliciting much redundant material in addition to relevant data.

The CCM approach can be modified. One way is to elicit uniform original data by video-conferencing, increasingly common because of the Covid-19 pandemic. Furthermore, the study can focus on exploring specific beliefs, e.g., the reasoning behind NMEs’ fears or the role of social relationships. In this case, the probing would go deeper behind the antecedents of the causes, accessed in the above cases.

A very different possibility is to examine not belief systems’ contents as here, but their characteristics such as differences of goal setting or simply relative complexity. That would allow using structured approaches like the above concept-pool method, permitting also larger samples and nomothetic studies. However, such studies should ensure that the pool instrument does represent the participants’ natural thinking. CMAP3 supports also the concept-pool method.

5.3 Cross-cultural and Cross-national Studies

Culture has been defined as the set of values, beliefs and behavioural expectations or “... the collective programming of the mind that distinguishes the members of one group or category of people from others” (Hofstede, 2011: 3). This makes culture essentially a cognitive phenomenon, expressed and mediated through people’s beliefs and causal reasoning (Bender et al., 2017; Oyserman & Lee, 2008), providing therefore an intuitive framework for explaining social behaviour. This also explains culture perspective’s popularity in entrepreneurship studies (Engelen et al., 2009; Valliere, 2017) concerned, e.g., with national cultures’ links with new firm emergence (Thurik & Dejardin, 2012) or with entrepreneurs’ self-efficacy and fear of failure (Wennberg et al., 2013). Entrepreneurship studies commonly describe national cultures in terms of Hofstede’s seminal dimensions power distance, individualism-collectivism, masculinity-femininity and uncertainty avoidance, later augmented with long-term-short term orientation and indulgence-restraint (Hofstede, 2001, 2011).

In the present context, cultures, especially national cultures, can be considered in two respects. First, they, rather their impacts, can be research targets. In this case the presently relevant issue is CCM’s ability to detect valid manifestations of cultures and cultural dimensions. Although the above studies were not specifically “cultural”, the findings enable roughly assessing CCM by examining the above ACMs’ (Figs. 3 and 4) congruence with the Finnish culture in terms of Hofstede’s dimensions. Thereby, particularly relevant

observations of the ACMs concern the salience of individual, not societal benefits as entrepreneurship's goals, the prominence of NMEs' personal fears, and, in the SBAs' case, their shunning of failure and emphasis of formal plans. These aspects can be interpreted to indicate individualism and uncertainty avoidance, perhaps also short-term normative orientation and indulgence, all typical⁵ characteristics of the Finnish national culture. Conversely, the ACMs show no traces of high power distance or collectivity, which are untypical of Finnish culture and should therefore be missing. The limited observations suggest that CCM enables exploring how cultures are manifested in actors' thought patterns. This may also provide one way of operationalising cultures, perhaps in particular cultures' specific aspects such as the prevalence of fears among nascent Finnish entrepreneurs.

Secondly, cultures are also research contexts that present distinctive problems, starting with the availability and accessibility of respondents; a precondition of data acquisition using methods like SSI. This is influenced by cultural factors like power distance, in practice varying rigid hierarchies and reachability of influential persons. Also, the esteem of academic research can vary, influencing accessibility but also how open the respondents are and thus data quality. A further condition of valid data is participants' trust in the researcher and the project (Maxwell, 2013; Nicolini, 1999). This too is a cultural issue, reflecting trusting or secretive societies (Welter & Alex, 2012), or professional and organisational silos. For instance, when studying professional elites of different cultures, not even necessarily different nationalities, the building of trust and rapport can take long and require repeated contacts and native members in the researcher team (Martinus & Hedgcock, 2015).

However, the issues should not be overstressed. First, the topics addressed in CCM studies are often neutral, not personal or controversial. Also framing the probing counts. For instance, when interviewing respondents like the NMEs, it may be better to ask what they think NMEs in general think, not what they personally think. For lay persons these tend to overlap. Secondly, especially with educated respondents more important than national cultural factors are often the findings' instrumental value and their personal values, even plain curiosity (Nelson et al., 2000). The authors' experience also suggests that simply feeling appreciated as informants and having, for once, an opportunity to "think aloud" and hear and be heard what one thinks, can be adequately motivating. For such reasons, CCM is, as a rule, probably more context-neutral than context-sensitive. Therefore, as shown above, CCM can, assuming appropriate probing, produce useful findings about cultures' manifestations in individual belief systems in different contexts.

Lastly, CCM studies can be also cross-national. This implies not only cultural differences but also problems of translation and interpretation if the respondents represent different language spheres. They may attach different meanings to the same words, problematic especially in the case of linguistically distant languages like Chinese v. English (Xian, 2008). The case is simpler when the parties share a language and/or in contexts like the EU where cross-national studies for practical and scientific purposes have become common (Birbili, 2000; Haak et al., 2013). However, the implications of cross-national settings are obvious. First, such CCM studies are ideally joint projects, native researchers handling data elicitation, translation and interpretation in each country, coordinated by a designated researcher/ team leader. Second, it is advisable to engage professional translators to ensure a valid translation of the original expressions into the project's standard and reporting language.

6 Conclusion

This chapter has discussed the CCM method applied to aspiring entrepreneurs and small business advisors. The findings show that the respondents' knowledge and understanding about starting and performance of new ventures differ markedly but logically. In research terms, this provides a new and deeper perspective to understanding entrepreneurial decision-making, in this case also counselling processes. Methodologically, the

⁵ <https://www.hofstede-insights.com/country-comparison/>. See also Lindell and Sigfrids (2008).

chapter shows that CCM, especially when computerised, facilitates an accessible and versatile approach to revealing and analysing entrepreneurial actors' subjective knowledge in different research contexts.

As for future CCM studies, one direction is to explore different entrepreneur types' belief patterns, e.g., solo v. team, first-time v. serial entrepreneurs, nascent entrepreneurs v. lay persons, educated vs. uneducated, nationals vs. immigrants, etc. Such studies are especially interesting in cross-cultural and/or cross-national settings. A second important application of CCM is to track belief systems' evolution resulting from interventions like counselling, critical events such as starting a firm, or when assessing the effectiveness of entrepreneurship education by examining the participants' mindsets' development (Nabi et al., 2017; Solesvik et al., 2013). Third, CCM can test or complement well-established theories. For instance, the widely used theory of planned behaviour (TPB) (Ajzen, 1991; Liñán & Fayolle, 2015) establishes how motivational antecedents determine individuals' entrepreneurial intentions. This, however, tells little (if anything) about the specific knowledge structures that drive persons to express favourable or unfavourable attitudes towards entrepreneurship, why they expect support from their reference people should they start up or what is the mental basis of their perceived control over the start-up process. Here, CCM can provide an essential complementing role. Lastly, representing an entirely different approach, CCM methods can help explore, using SSI data collected from persons who know a specific domain well, the structure and causal mechanisms of social or socio-technical systems for developing intervention methods or new theory (cf. Montibeller et al., 2008; Pyrko & Dörfler, 2018; Russell, 1999). We hope entrepreneurship researchers find this chapter interesting and inspiring to explore some of these avenues for future research.

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