Interactive Profit-Planning: a Social Learning Reconceptualization.

ABSTRACT

Since 1987 the conceptualisation of interactive profit-planning has used the assumption ground of the 'choice' perspective. That prevailing conceptualisation can be summarised as: "If top management *choose* to involve themselves in routine profit-planning debates, information for emergent strategy automatically flows up into (interactive) profit-plan formulation decision making."

Using a problematization methodology I develop an alternative conceptualisation, using assumption grounds from the social learning perspective. The alternative conceptualization is: "Interactive profit-planning is a dynamic distributed knowledge creation system, which relies on and structures the semi-serendipitous emergence and operationalization of tacitly generated ideas."

Using survey data I find support in favour of the social learning-based reconceptualization. Several implications for theory-generative research are discussed, including the proposition that management control system routines be sometimes defined as 'knowledge-based' rather than 'information-based'.

Key Words

Budgeting, emergent strategy, interactive management control system, knowledge, profit-plan, social learning, strategic choice and survey.

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INTRODUCTION

With the construct 'interactive profit-planning' Simons (1987, 1990, 1991, 1994) contributed a powerful perspective, whereby budgeting systems could be used to achieve competitive advantages in dynamic conditions. The construct uniquely views top and lower level managers as interacting in profit-planning routines to formulate and implement emergent business strategies.

In this paper, I problematize the assumption that top management can simply 'turn-on' emergent strategy-making processes by choosing to involve themselves 'interactively' in profit-planning routines. This assumption reflects the 'choice' perspective (Wooldridge et al., 2008) and it remains implicit in the contemporary interactive management control systems literature. I problematize the 'choice' assumption using the 'social learning perspective'.

The social learning perspective assumes that organisations are too complex to be managed simply by the 'choices' of top management (Wooldridge et al., 2008). The role of top management is viewed more as allowing socially-constructed ideas for change to occur emergently (Wooldridge et al., 2008). Emergent strategy processes are seen as less about top management 'choosing' what information (systems) the organization should process and more about top management as heedful participants in distributed systems of organizational knowledge creation (Nonaka, 1994; Wooldridge et al., 2008).

The problematization methodology (Alvesson and Sandberg, 2011) used herein involves: (1) explicating the 'choice' assumptions underlying the extant conceptualization of interactive profit-planning (and management controls systems more generally); (2) challenging those assumptions from the alternate assumption grounds of the social learning perspective; (3) developing two consequent research questions; and (4) conducting an empirical investigation to address those research questions.

The empirical investigation uses a survey method with data from 307 Australian business units. The findings provide support for the social learning perspective over the choice perspective. Thus, the evidence suggests that a social learning-based conceptualization of interactive profit-planning has more validity than the prevailing choice-based conceptualization.

This research does not aim to disrupt existing literature, but instead to provide a perspective with which future research could extend the established body of literature. This research is supportive of the prior interactive MCS literature, whilst also providing a reconceptualization that provides a point of departure for innovative and interesting theory-generative research. This research does not challenge the explanatory models and related empirical findings of prior research. The problematization methodology aims at generating new and interesting research projects (Alvesson and Sandberg, 2011), herein by using advances in referral theories that have occurred since the time of Simons' pioneering work.

The remainder of this paper is organized as follows. First, the need to reconceptualize the construct is argued. Secondly, the choice and social learning perspectives are presented. Thirdly, the problematization argument is developed and the two research questions developed. Fourthly, the empirical investigation is presented. Lastly, there is a 'preliminary results summary and discussion' section.

THE NEED TO RECONCEPTUALISE THE CONSTRUCT

Profit-planning systems are the most organizationally comprehensive and most integrative type of management control system. Herein, the terms 'profit-planning systems' and 'management control systems' are sometimes used interchangeably. Management control systems (MCS) can be defined as formal, information-based routines that provide managers with cybernetic measures to maintain or alter organizational activities in line with objectives and strategies (Simons, 1990). This paper focusses empirically on profit-planning systems, which are based on budgeting systems, but also include forecasting systems (Simons, 1995).

Since Simons' (1987, 1990) seminal research, interactive MCS has become a dominant research construct (Grafton, Lillis, & Widener, 2010) and textbook topic (Simons, 1995, 2000, 2005). It has illuminated many insightful action-oriented aspects of MCS (Langfield-Smith, 2007; Chenhall, 2003; Ahrens and Chapman, 2004). As it has become more prevalent it has also attracted more scrutiny. Many scholars have called for a much sounder conceptual specification (e.g., Bisbe, Batista-Foguet, & Chenall, 2007; Widener, 2007; Merchant and Otley, 2007; Frow, Marginson, & Ogden, 2010; Hall, 2010; Tessier & Otley, 2012).

Without a sound construct conceptualisation there is the risk of severely flawed conclusions regarding the existence, magnitude and directions of relationships with other constructs (Bisbe et al., 2007; Edwards and Bagozzi, 2000; Jarvis et al, 2003). Rigorous construct specification and construct validation processes are much more common in many other social science literatures (Bisbe et al., 2007; Luft and Shields, 2003). There have been numerous calls for higher precision in specifying MCS constructs generally (Van der Stede, 2001; Chenhall, 2003), and especially for practice-defined constructs such as interactive MCS (Luft and Shields, 2003; Bisbe et al., 2007).

The construct will be conceptually under-specified until the literature has attained an empirically validated agreed-upon meaning for it (Bisbe et al., 2007). The process of achieving an agreed-upon meaning occurs within a research community, as subjective perspectives of researchers produce outcomes that become more 'objective' through processes of inter-subjective agreement over time (Luft and Shields, 2013).

Unlike theory-defined constructs, which tend to have well-defined unitary meanings, practice-defined constructs require a thorough cataloguing of the practice aspects, along with development of theory to convincingly explain those aspects (Luft and Shields, 2003; Bisbe et al., 2007). Practice aspects observed in field research can include a "background knowledge" style of theory that can be further developed along with the development of empirical methods for the construct (Van der Stede, 2013: 7).

The argument that I develop and setup for empirical testing is that the theory-basis of the interactive MCS construct has certain problems that, if resolved, can enable the achievement of an agreed-upon meaning and clearer construct specification to evolve. Where there is some prevailing agreed-upon meaning, it reflects a problematic 'choice' perspective. This issue with the construct reflects a preoccupation with top management that others have criticized previously (Gray, 1990; Davila et al., 2009; Frow et al., 2010).

The Practice-Basis of the Construct

The practice-based aspects of interactive MCS were observed in a series of field studies (Simons, 1987, 1990, 1991, 1994). With interactive MCS use, top management were observed to have regular face-to-face involvement with lower level managers for developing and deciphering feed-forward and feedback MCS information (Simons, 1995). The use of interactive MCS was observed to "trigger revised action plans" with resulting "re-forecasting of future states based on revised current information" (Simons, 1995: 108-109). An interactive MCS has regular "debate of underlying data, assumptions, and action plans" (Simons, 1991: 50), and might be "interactive down three or four levels in the organization" (Simons, 1995: 102, 2005).

According to Simons (1995), interactive MCS is opposite of a diagnostic MCS. With a diagnostic MCS top management direct or authorize feed-forward information so that it aligns with deliberate strategies which they then subsequently track progress of through feedback reports (Anthony, 1965). Ostensibly, interactive and diagnostic MCS "represent two extremes of a continuum of top management attention" (Simons, 1991: 51).

Whilst Simons alluded to many properties of an interactive MCS, he consistently referred to the *main* defining feature as 'the level of top management involvement in the MCS' (e.g., Simons, 1990: 137; 1991: 49; 1995: 97; 2005: 141).[1] This definition reflects the problematic 'choice' assumption that underlies the prevailing construct conceptualization. According to Peters (2009), the survey-based studies up until 2007 also consistently followed Simons' proposition that 'top management involvement' as the main defining feature of interactive MCS (e.g., Abernethy & Brownell, 1999: 191; Davila, 2000: 396; Van der Stede, 2001: 123-124; Bisbe & Otley, 2004: 711; Widener, 2007: 760).[2]

Construct Operationalization

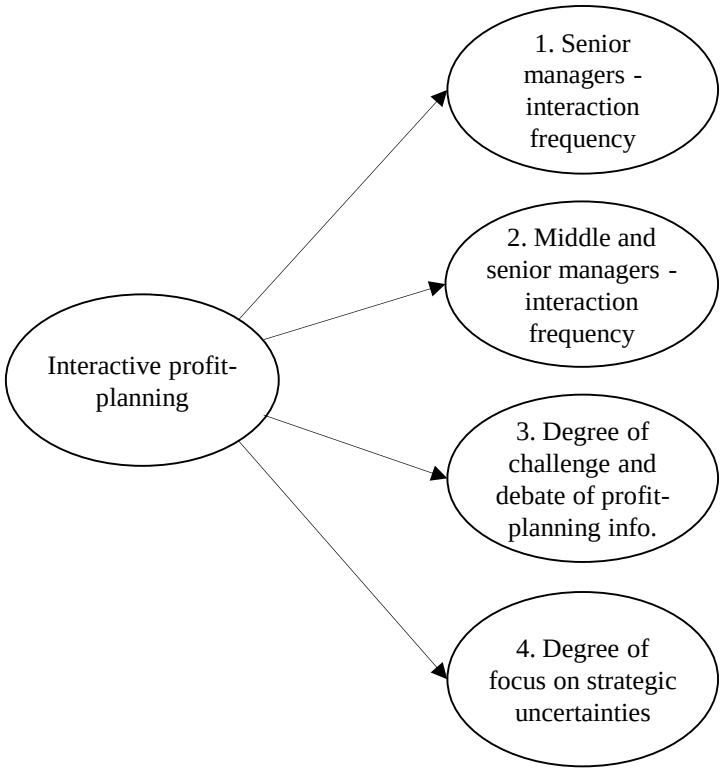
In clearly expressing specific concerns about the construct specification Bisbe et al. (2007) outlined a detailed methodology for improving the operationalization of it. Peters (2009) undertook a process to develop an agreed-upon operational meaning of the construct, by

[1] Some examples of the role of top management involvement in Simons' conceptualization of interactive control are as follows. Simons (1990: 137) argued that "the personal involvement of top managers…is the defining characteristic of interactive control". "Based on the amount of top management attention directed to a control system, a management control system can be labeled as interactive when top managers use that system to personally and regularly involve themselves in the decisions of subordinates" (Simons, 1991: 49). "Although this research treats systems as either interactive or diagnostic, these labels represent two extremes or a continuum of top management attention" (Simons, 1991: 52). "An 'interactive control system' is limited, by definition, to a system that is an important and recurring agenda addressed by the highest levels of management" (Simons, 1995: 97). "Like a waterfall, management attention cascades down from the top of the organization. So the critical question becomes, 'What information is the boss watching?'" (Simons, 2005: 141).

[2] The following excerpts from the survey-based literature show consistent identification of top management involvement as the main defining feature of interactive control. According to Abernethy and Brownell (1999: 191), "A defining feature of interactive use of budgets is the continual exchange between top management and lower levels of management." According to Davila (2000: 396), "…the information was used constantly in the interactions with my team." According to Van der Stede (2001: 123-124), "…control is interactive when top managers actively use planning and control systems to monitor and intervene in ongoing decision activities of their business unit managers." According to Bisbe and Otley (2004: 711), "…what characterizes interactive controls is senior managers' strong level of involvement." According to Widener (2007: 760), "…an interactive system is forward-looking and characterized by active and frequent dialogue among top managers."

evolving the framework provided by Bisbe et al. (2007) in the light of the empirical evidence from published survey-based studies. From that process, and along with extensive face validity tests with practitioners, Peters (2009) developed a four dimensional latent construct model, as per Figure 1. Interactive profit-planning is reflected by four covarying dimensions: (1) the frequency of top management interaction routines; (2) the frequency of interaction routines between top and middle managers; (3) the degree of face-to-face challenge and debate in the interaction routines; and (4) the degree of focus upon strategic uncertainties in the interaction routines.

Figure 1: Four dimensional latent construct model



The four dimensional construct model is pivotal to the empirical investigation of the two research questions that I develop out of the problematization process. If the 'choice' perspective were valid, variation in the construct would be caused by variation in the frequency of top management involvement in interaction routines. On the other hand, if the social learning perspective were valid, variation in interactive profit-planning would be reflecting (manifesting) a social learning-based phenomenon.

CHOICE VERSUS SOCIAL LEARNING

The 'choice perspective' (Wooldridge et al., 2008) assumes that the role of top management is to make strategic decisions (Chandler, 1962; Child, 1972; Ansoff, 1965; Porter, 1980; Hambrick and Mason, 1984). It views strategy as a top-down analytical process, with middle manager roles limited to implementation and providing decision useful information to top management (Wooldridge et al., 2008). The 'social learning perspective' (Wooldridge et al., 2008) instead sees middle managers as having knowledge of operating capabilities coupled to access to top management. This combination enables middle manages to function as mediators between the organization's strategy and day-to-day activities (Nonaka, 1994).

Wooldridge et al. (2008) outline three reasons for a social learning perspective, as follows. Firstly, middle managers are important interfaces between the otherwise disconnected actors and domains of top and operating-level managers. Situated in these influential networked positions, middle managers can act as sources of resistance or agents of change. Secondly, as a complement to the view of elites as a key source of influence on organizational outcomes (Hambrick and Mason, 1984), middle management research posits an alternative model of managerial agency and strategic choice. Complex organizations cannot be managed by single actors or even small top management groups, but rather distributed and interactive leadership is required throughout the organization, with middle managers being important mediators between levels and units. Thirdly, middle managers are more likely to penetrate the causal ambiguities surrounding relationships between an organization's capabilities and its economic performance (King and Zeithaml, 2001).

Table 1 presents a summary of the different intellectual roots, process models, key actors, process mechanisms and contextual framing of the two perspectives (Wooldridge et al, 2008). In the next section of this paper, these differing perspectives are used as the basis of the alternate assumption grounds in the problematization argument.

Table 1: Foundations of the choice and social learning perspectives in strategy

	Choice Perspective	Social Learning Perspective
Intellectual roots	Chandler (1962), Child (1972), Ansoff (1965); Andrews (1971), Porter (1980), Hambrick and Mason (1984)	Mintzberg (1978), Bower (1970), Kanter (1982), Burgelman (1983a,b), Nonaka (1991, 1994).
Process model	Decision making	Social learning process
Key actors	Top management team	Multiple actors with middle managers as important mediators between levels and units
Process mechanisms	Analysis, decision making, and implementation	Generating ideas, initiative taking, strategic reintegration
Context	Complexity manageable by one central actor or team	Complexity beyond single actor's ability to integrate fragmented power and knowledge base

Source: Wooldridge et al. (2008).

PROBLEMATIZATION

Overview of Problematic Assumptions

In this section I apply a problematization methodology (Alvesson and Sanderson, 2011). The assumption ground of the choice perspective – as applied by Simons - is challenged from the perspective of the alternative assumption ground of the social learning perspective. Table 2 presents an analysis of 'choice' assumptions as are embedded in the prevailing conceptualisation of interactive MCS, as well as alternate 'social learning' assumptions that I have constructed by drawing from Table 1. I begin by explicating the complex synthesis by which Simons theorised that top management can choose emergent strategy-making by way of choosing an interactive MCS.

Along with the articulation that the defining feature of an interactive MCS is 'the level of top management involvement' (e.g., Simons, 1990: 137; 1991: 49; 1995: 97; 2005: 141), Simons embedded 'choice' assumptions in the interactive MCS conceptualisation. For example, Simons argued that top managers have the "strategic choice" (Simons, 1991: 61; 1994; Child, 1972) of an interactive MCS. With "strategic choice", top managers are seen to have discretion over the choice of environment, product offerings, production facilities, diversification, new technologies, and markets (Child, 1972). Top managers with a strategic vision employ their understanding of existing business operations to determine the strategic uncertainties with which they choose to manage with use of a suitable interactive MCS (Simons, 1991, 1994).

Simons (1991; 1995; 2000) related certain strategic uncertainties to strategy archetypes, further assuming 'choice'. Strategy archetypes, such as prospectors or defenders (Porter, 1980) assume that business strategies tend to have naturally emerging and predictable content configurations, such that strategic decision processes are highly rational, involving comprehensive analysis, integration and evaluation of alternatives by top management (Ansoff, 1965; Barney, 1991). For example, according to Simons' synthesis, where top management are implementing a prospector strategy (Porter, 1980), by making a profit-planning system interactive, top management can centrally orchestrate the emergent formulation and implementation of new product innovations.

Simons (1990: 137) wrote that "The choice by top managers to make certain control systems interactive (and program others) provides signals to organizational participants about what should be proposed and tested. The signal activates organizational learning and through the debate and dialogue that surrounds the interactive management control process, new strategies and tactics emerge over time". "Strategies are incremental and emerge over time' intended strategies are often superseded; formulation and implementation are often intertwined; strategic decisions occur throughout the organization; and strategy equals a process" (Simons, 1995: 20). By choosing to make a profit-planning system interactive, top managers choose certain emergent strategy content (i.e., product innovation and associated value chain change). That is, by way of interactive MCS, top management are assumed to have the choice of 'turning-on' certain emergent strategy-making processes.

Table 2: Interactive MCS assumption grounds: the choice versus social learning perspectives

Prevailing assumptions of 'Choice'	**Alternate assumptions of 'Social Learning'**
Top managers are responsible for the formulation and implementation of business strategies (Simons, 1990).	Top and middle managers are responsible for the formulation and implementation of business strategies.
Top management choose an interactive MCS that collects and generates information that relates to strategic uncertainties, i.e., issues that top management perceive could invalidate the current business strategy (Simons, 1990; 1991; 1994; 1995; 2000; 2005).	Top and middle managers (inter)act on reflexive strategy formulation and implementation processes mediated by their uniquely individual knowledge-resources. Strategic uncertainties perceived by lower level managers may not be understandable by the limited operational knowledge-bases of top managers.
Top management can overcome defensive information with-holding by middle managers by making a MCS interactive. (Simons, 1990; 1994: 170; 2000: 261).	Situated in influential networked positions, middle managers can act as sources of resistance or agents of change. Middle managers have their own overt and covert powers of agency and strategic choice.
Top management can choose the content of emergent strategy-making by the type of MCS they make interactive (Simons, 1990: 137; 1991; 1995; 2000).	Managers at all levels have some power over what ideas and tacit knowledge they contribute (or withhold) from interactive MCS routines.
The contents of business strategies are archetypal (e.g., Porter, 1980) and can be chosen by top managers (Simons, 1991; 1995; 2000).	Strategies depend on the unique and idiosyncratic path-dependent knowledge embedded within a firm's operating capabilities (as tacitly experienced by lower level managers).

Interactive Profit-Planning as Emergent Strategizing

As a critique of the choice perspective, Mintzberg (1978) argued that the separation of strategy formulation from implementation falsely divides work between top management (i.e., thinking) and lower level management members (i.e., doing). Mintzberg and Waters (1985) argue that realized strategy forms from emergent influences at middle and lower levels of the organization, as well as from deliberate influences emanating from the top. Emergent strategy originates not in the mind of the strategist, but in the interaction of the organization with its environment. Emergent strategies tend to exhibit a type of convergence in which ideas and actions from multiple sources integrate into a pattern (Mintzberg, 1978).

To facilitate an understanding of relations between strategic choice and emergent strategy-making, Mintzberg and Waters (1985: 263) wrote: "Almost all strategy making behaviour involves, to some degree, a central leadership with some sort of intentions trying to direct, guide, cajole or nudge others with ideas of their own." They conceived of "deliberate and emergent strategies as two ends of a continuum along which real-world strategies lie" (Mintzberg and Waters, 1985: 257). In conceptualising the middle-ground of the continuum, Mintzberg and Waters (1985) provide a series of possible configuration types. However, as none of the types concerned MCS, Simons had to conceptualise interactive MCS use somewhere in the ambiguous middle-ground of the continuum. In doing so, Simons assumed strategic choice in a variety of synthesised ways, as were explicated in Table 2 (above).

Knowledge (not information) is what 'emerges'

To problematize the 'choice' assumptions, we need to consider what it is, most fundamentally, that 'emerges'. Is it information that emerges in interactive profit-planning, or are ideas and knowledge the more important phenomena?

According to the social learning perspective, emergent strategy processes are best understood as knowledge-based. Organizational complexity is beyond a single actor's or central team's ability to integrate the fragmented power and knowledge-base (Wooldridge et al., 2008; Nonaka, 1994). Middle managers "play a key role" in emergent strategy processes, they "synthesize the tacit knowledge of both front line employees and senior executives, make it explicit, and incorporate it into new products and technologies" (Nonaka and Takechi, 1995: 16).

A knowledge-based paradigmatic approach is very different to the information processing model (Galbraith, 1977) that underlies the strategy process in Simons' (1987; 1995) interactive MCS conceptualisation. In response to perceived strategic uncertainties particular to high market dynamism and product-market innovation (i.e., a prospector strategy archetype), top management choose to make profit-planning systems interactive, so that the organization processes a comprehensive information framework (i.e. profit-planning information) suited to learning and improving the overall environmental fit of the business unit (Simons, 1987; 1995). This information processing by interactive use is for signalling, scanning, and searching; all of which feed into making decisions for formulating profit-plans (Simons, 1990).

As an approach to 'knowledge', the choice perspective is overly simple, being a 'conduit model' in which communication of 'knowledge' can be improved by increasing the channel capacity and by making it more universally available (Boland and Tenkasi, 1995). Here,

'knowledge' is reduced to information expressed as 'objective' facts (Knights & Wilmott, 1999: 9), where coordinated action is viewed as dependent on higher-level managers collecting more and more 'knowledge' (Tsoukas, 1996). This is an overly simple and mechanistic view of knowledge (Goodall and Roberts, 2003).

In contrast to a conduit model, with a knowledge-based paradigmatic approach, knowledge is a determinant, mediator and receiver of information (Nonaka, 1994; Polanyi, 1967). Knowledge is a person's perception and understanding, embedded in their unique tacit knowledge (Polanyi, 1967), and a unique and perpetually hypothetical perspective (Boland & Tenkasi, 1995). "In short, information is a flow of messages, while knowledge is created and organized by that very flow of information, anchored on the commitment and beliefs of its holder" (Nonaka, 1994: 15). An individual's commitment and beliefs are held in their unique tacit knowledge (Nonaka, 1994; Polanyi, 1967).

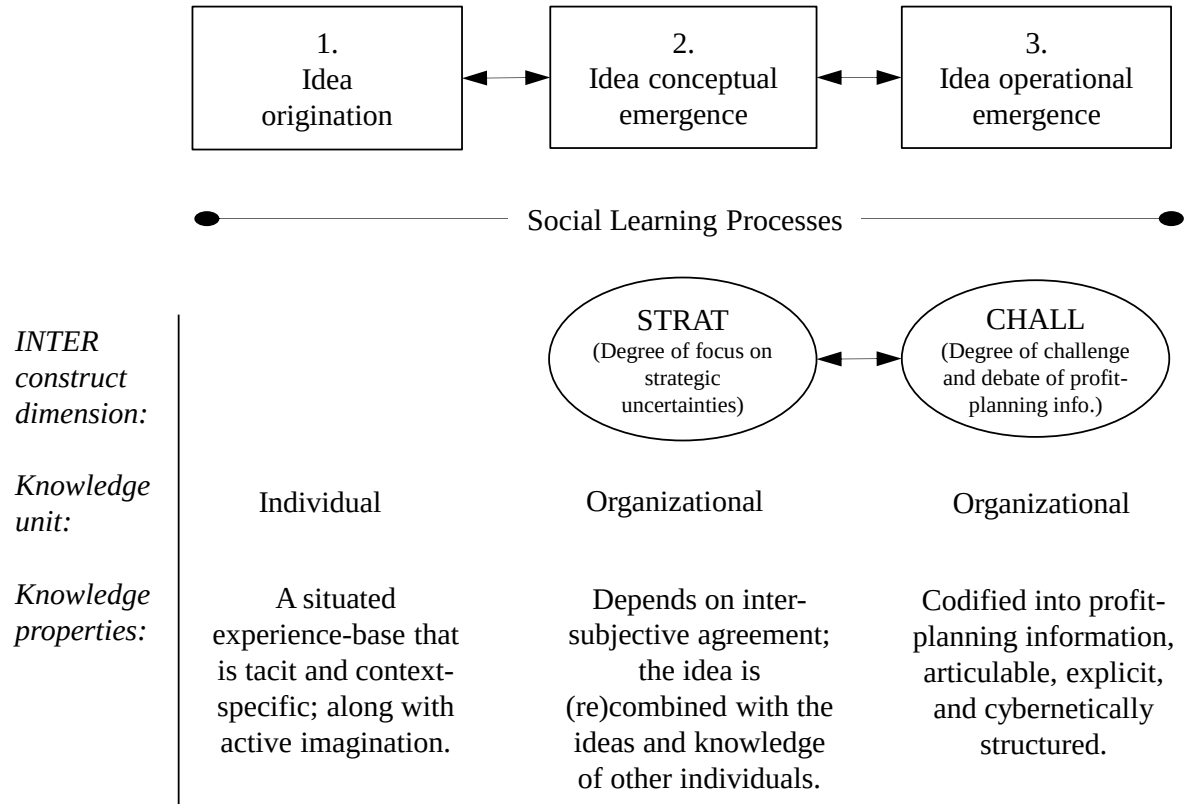
Knowledge is an individual-level phenomenon. Individuals, not organizations, create knowledge. Knowledge cannot be aggregated or grouped – there is no 'connected psychic network'. For conceptualizing organizational knowledge, Weick & Roberts (1993: 363) argue for a 'collective mind' whereby individuals "construct their actions (contribute) while envisaging a social system of joint actions (represent), and interrelate that constructed action with the system that is envisaged (subordinate)". An individual contribution helps enact the collective mind to the extent to which it is closely (or heedfully) interrelated with the imagined requirements of other contributing individuals in a situation of joint (inter)action.

The collective mind is a 'distributed knowledge system'; it is known in its entirety to no one, although portions of it are known differentially to all (Tsoukas, 1996; Weick & Roberts, 1993). The collective mind is an emergent knowledge phenomenon: a firm's knowledge is ever-emerging and is never complete, it is never possessed by a single agent, and it partly originates outside the firm (Weick & Roberts, 1993; Tsoukas, 1996). Because of the tacitness of knowledge, the creation of organizational knowledge depends not on the accumulation of 'objective' empirical facts (e.g., information), but on intersubjective agreement (Goodall & Roberts, 2003).

A knowledge-based paradigmatic approach has two important implications for problematizing the assumption that emergent strategy-making by interactive profit-planning is a top management choice. Whilst a top management may well choose to call meetings in which they challenge and debate profit-planning information, such interactions may not necessarily cause the knowledge emergence that is needed for emergent strategy-making. Emergent strategy-making requires that knowledge emerge in a (sometimes reflexive) mediational sequence whereby: (1) an idea is originated from the knowledge-resources of an individual, and (2) that idea must emerge into organizational action vial social learning processes. This knowledge emergence flow is diagrammed in Figure 2 and discussed in the following two sub-sections.[3]

[3] An idea is a concept formed by mental effort and reproduction. The Dictionary of Philosophy and Psychology (1998; Baldwin, M (editor)), defines idea as "the reproduction with a more or less adequate image, of an object not actually present to the senses." Further, an idea is frequently composite, that is; what is reproduced as a single idea is often a combination of many ideas each of which can differ greatly in detail.

Figure 2: Emergent knowledge flows in interactive profit-planning



Ideas may not be originated and articulated

The information processing perspective (Galbraith, 1977) assumes that the business environment somewhere already holds information needed for organizational processing into emergent strategy-making (*cf.*, Barney, 1991). With a knowledge-based perspective, ideas for use in formulating emergent strategies must originate from knowledge-able sources. Those knowledge-able individuals (i.e., those who are suitably idea-able) have a degree of covert power because, unless they articulate the idea, others will not know about it, due to, for example, tacitness (Zollo and Winter, 2002) and the limits of other mangers knowledge-abilities (Goodall and Roberts, 2003).

Ideas for processing in emergent strategy-making need combine with experiential knowledge. An idea for improving the efficiency or effectiveness of some aspect of an organization must combine something new and 'original' with something already experienced in the organization. The concept of knowledge-ability (Goodall and Roberts, 2003) recognises that new ideas (such as for emergent strategizing) are always framed by experience (Giddens, 1979). Ideas for incremental business development are largely constructed from experience accumulated within the business, and much of that experience is likely tacitly accumulated (Nonaka, 1994). Being distributed (Boland and Tenkasi, 1995; Weick & Roberts, 1993; Tsoukas, 1996), such tacit knowledge is organizationally dispersed and often context-specific (Nonaka, 1994), and thereby 'at a distance' (Goodall & Roberts, 2003) to many profit-planners, limiting their ability to originate, conceptualise or understand someone else's idea in detail.

This notion of knowledge-ability (Goodall and Roberts, 2003) helps explain why top management can only have conceptual understanding of both actual and ideated organizational capabilities. Knowledge-ability also helps explain why top management cannot necessarily know if a middle or operating manager is with-holding an idea that could be potentially useful for emergent strategizing. As per the 'collective mind' conceptualisation (Weick & Roberts, 1993), top management must subordinate some of the construction of their own knowledge-abilities to the knowledge-abilities unique to the holders of organizational vantage points in middle and lower management levels (Zollo and Winter, 2002). However, an individual with a certain vantage point that could potentially yield idea-useful tacit and context-specific experience may not have the cognitive resources or imagination for idea-making (Woodbridge et al., 2008; Zollo and Winter, 2002).

Even if a strategically situated individual is 'idea-able' for various reasons they may choose to withhold their ideas (for example, in their involvement in interactive MCS). The knowledge-abilities granted from a unique network centrality and operational situated-ness of many middle manager positions grants an embedded human agency that gives more power to choose what ideas they articulate (Wooldridge et al., 2008). Whether out of self-interest or otherwise, middle managers can choose to resist or champion emergent change ideas (Wooldridge et al., 2008).

In Figure 2, the willingness of an idea-able individual to transfer (by articulation) their ideas into emergent organizational knowledge creation processes (Nonaka, 1994) is represented by the arrow going from box 1 to box 2. Without willingness, an idea may not enter into the social learning processes (spanning boxes 2 and 3 in Figure 2) that underlie emergent strategy-making (such as in interactive MCS). In social learning processes, there is also reflexivity between the individual and the social (as per the double-headed arrows in Figure 2), as I discuss next.

Ideas may not emerge into and through profit-planning processes

The argument that I would like to make (more fully in a future draft) is that social learning processes are complex and not automatic responses to top management cues.

Interactive profit-planning is a distributed knowledge system. With articulation, tacit knowledge is converted into explicit knowledge, making it more knowledgeable to other profit-planners, who by combining it with their own explicit and tacit knowledge, create new knowledge. If a profit-planner then articulates some aspect of this new knowledge, it gets amplified and emerges yet further into the distributed knowledge system (Nonaka, 1994).

When an idea does successfully emerge enough to be encoded into profit-planning information, in terms of knowledge properties, it will have been articulated and made relatively explicit, especially if it has been subjected to trial and there is some actual operational experience of it encoded into profit-planning information. At this stage of the idea emergence, there is sufficient organizational operationalization of it such that it can be quite readily perceived and understood, enough that it may be a subject in multilevel managerial challenges and debates of profit-planning information. Hence, relating to box 3 in Figure 2, the knowledge properties for the CHALL dimension of interactive profit-planning (i.e., the degree of challenge and debate of profit-planning information) are listed as: articulable, explicit and cybernetically structured.

In contrast, the more complex end of the spectrum of social learning (around box 2 in Figure 2) involves the conceptual emergence of the idea. Without new ideas interactions will not have adequate material for there to be challenge or debate of profit-plan formulations and implementations. In Figure 2 the double-headed arrow shows a reflexive set of paths between the three boxes, Hence, relating to box 2 in Figure 2, the knowledge properties of the STRAT dimension (i.e., the degree of focus on strategic uncertainties) concer inter-subjective agreement during processes whereby the idea is exchanged and (re)combined with ideas and knowledge of other individuals.

Nahapiet and Ghoshal, (1998: 250) emphasize that "the combination and exchange of knowledge are complex social processes and much valuable knowledge is fundamentally socially embedded – in particular situations, in coactivity, and in relationships". Patterns of connectedness are both cognitive and relational; they are built on norms, identifications, obligations and expectations, as well as shared meanings, narratives, codes and language that are produced and reproduced over time in co-working (Goodall and Roberts, 2003; Nahapiet and Ghoshal, 1998). Emerging knowledge is context-specific and continually subject to negotiation, transformation, redefinition, and recombination (Kogut & Zander, 1992; Nonaka, 1994). As Tsoukas (1996: 14) clearly states, "individual knowledge is possible precisely because of the social practices within which individuals engage – the two are mutually defined".

There is research evidence that early-stage emergent strategy work often happens without top management involvement or detailed knowledge (Mirabeau and Maguire, 2014). Middle managers shape emergent strategy processes by influencing which ideas or issues come to top management attention, using their knowledge-resources in interpreting, framing and packaging of such knowledge creation "strategic choices" (Wooldridge et al., 2008). Middle managers also make choices about which MCS to use and adapt as part of strategy processes (Floyd and Lane, 2000; Marginson, 2002).

Research Questions and Empirical Testing Implications

The two research questions refer to the four dimensions of the latent construct model (as per Figure 1), namely:

1. frequency of top management interactions
2. frequency of interactions between top and middle managers
3. degree of face-to-face challenge and debate in the interactions
4. degree of focus upon strategic uncertainties in the interactions.

Research Question 1

RQ1: for interactive profit-planning, is top management involvement:

a. a sufficient condition (as per 'choice'), or
b. a necessary but insufficient condition (as per 'social learning')?

Empirically:

a. A 'choice' perspective would be supported it the four factors are separate and the top management involvement factors cause the other factors.
b. A 'social learning' perspective would be supported if the four dimensions are conjoined, reflecting a distributed social learning system.

Research Question 2

RQ2: what is/are the most valuable (i.e., competitively advantageous) dimension/s of interactive profit-planning?

Empirically: is it dimensions 1 and 2 that entail top management involvement, i.e., 'choice'? Or is it dimensions 3 and 4, which measure the distributed social learning that occurs via the challenge and debate of profit-planning information and strategic uncertainties, i.e., 'social learning'?

EMPIRICAL INVESTIGATION

The survey development and administration took place in Australia in 2007. Two main statistical procedures were performed on the dataset (n = 307). The first procedure, factor analysis in AMOS, is used for research question 1. The second procedure, partial least squares (PLS) path modelling, is used for research question 2.

Sample selection and data collection

A cross-sectional research design was used. Target respondents were business unit 'senior managers', defined as the top manager of the business unit and his/her direct reports. Two sampling controls were used. First, minimum firm size was set at $20m AUD annual revenue and 150 employees (Henri, 2006a, 2006b), because organizational and strategy related variables may not apply to small firms (Miller, 1988; Bouwens & Abernethy, 2000). Second, firms had to be at least three years old as interactive MCS are unlikely to be used in the business start-up phase (Simons, 1995).

Dillman's (2006) Total Design Method was followed. A multi-contact, mixed mode method using mail and web-based questionnaires was used. To enhance content validity, 21 practitioners and two professors checked the clarity, wording and questionnaire layout, over three pre-testing phases: (1) one-on-one meetings to develop the new scales; (2) testing the mail mode; and (3) testing the web-based mode. Survey distribution was over a six week period from November 2007. In round one, target respondents were mailed a cover letter, questionnaire, completion notification postcard and return envelope. From round two, they were emailed wherever possible, with postal mail re-contacting made if an email address as unavailable. Target respondents were re-contacted four times, and were offered anonymity and an executive report on the findings.

Two mailing lists were acquired, one from Dunn and Bradstreet and another from IncNet. Responses were received from 546 firms, a response rate of 32.8%. After removing 28 invalid responses and 211 that did not meet the sampling controls criteria, the final sample was made up of 307 usable questionnaires. Table 3 reports the roles of respondents. Table 4 gives a breakdown using the industry classification system from the survey.

Table 3: Respondents by role

	n	***%***
CFO / Finance Director	89	29.0%
CEO / Managing Director	82	26.7%
Senior Finance Manager	77	25.1%
SBU Head	33	10.7%
Other Senior Manager	26	8.5%
	307	**100%**

Table 4: Respondents by industry

Manufacturing	113	37%
Services	58	19%
Wholesale Trade	29	9%
Finance, Insurance and Real Estate	25	8%
Mining	23	7%
Construction	20	7%
Retail Trade	16	5%
Agriculture, Forestry and Fishing	12	4%
Transport, Communications and Utilities	11	4%
	307	**100%**

Non-response bias testing

Non-response bias was assessed on all possible data by comparing early and late respondents using the midpoint of the responses (Moore & Tarnai, 2002). The indicator variables and the construct variables were tested for differences in distribution using independent sample tests (Mann-Whitney U), which revealed no significant differences, thus suggesting that non-response bias was not apparent.

Measurement of constructs

Interactive profit-planning (*INTER*)

As per Peters (2009)….

As discussed in following, an extensive process was undertaken to evolve and operationalize the five dimensional framework proposed by Bisbe et al. (2007). A review was undertaken of all the empirical interactive MCS literature published up until the time of the survey process in 2007. Four different sets of Likert scales had been used in five separate studies; all were unidimensional and reflective, with reliability and validity analyses reported via correlation analysis, factor analysis and Cronbach alphas. It became apparent that many of those indicator items strongly overlapped conceptually with the first four dimensions of the Bisbe et al. (2007) framework, and that, collectively, the empirical evidence was for a reflective (latent) model, and not the emergent (formative) type of model as proposed by Bisbe et al. (2007).

For three main reasons, the decision was made to drop from the operationalization process the fifth dimension of the Bisbe et al. (2007) framework (i.e., a facilitative leadership style of top managers). First, with respect to advancing an agreed-upon meaning, that dimension had no status in the survey-based literature. For emergent constructs, for a dimension to be accepted as part of a construct there must be agreement from the research community, because there is no other way of testing the validity of that dimension (Jarvis et al., 2003). Second, consistent with the assumption of a latent construct model, only a sample of dimensions is required (given the high correlations between dimensions because they reflect a defining feature), not the census of dimensions needed for an emergent model (Jarvis et al.,

2003). Third, it was very unclear from Simons' literature whether the dimension was supposed to refer to the top manager or to top managers (i.e., the top management team).

The existing survey-based instruments were unidimensional and ranged from four to seven indicator items. A multidimensional approach requires four items per dimension if it is to be fully specified in co-variance-based SEM. To develop the 16 Likert scales to operationalize the four selected dimensions of the Bisbe et al. (2007) framework, thematic analysis was performed on all the published interactive MCS literature, including the existing Likert scales. Eventually this process produced a draft set of 24 scales and associated definitions for the survey instrument, which were used as the starting point for pre-testing and pilot-testing. The development and administration of the survey instrument adhered to the Total Design Method (Dillman, 2006). The design and development of the Likert scales was informed by the issues and procedures advocated by Netemeyer et al. (2003).

There were three phases of pre-testing. In the first phase, 11 practitioners individually provided face-to-face feedback on the content validity of the drafted dimensions and indicators. Such domain experts and the face-to-face format are especially effective for ensuring content validity (Dillman, 2006). During the second phase of pre-testing, six new practitioners and two professors provided face-to-face feedback on a reduced set of Likert scales. In the third phase, the final 16 Likert scales were selected and tested as part of the survey pilot-testing processes, which involved eight new practitioners. The pre-testing produced four indicators for each of the four dimensions, designed as reflective.

The following definitions were provided in the questionnaire. Senior management is 'the business unit top manager and his/her direct reports'. Middle management is 'below the senior management team'. Drawing from Simons (1995: 109), a "Profit-plan outlines the planned sales revenue, expenses and net income - usually by month. Profit-plans are typically set annually (e.g., as part of the annual budget), and may be updated with forecasts. *Profit-planning* is an activity that undertakes and compares budgeted, forecasted and actual revenue and expenses by revenue and cost category". Nine point-Likert type scales were used (1 = 'Strongly Disagree' for *low*, 9 = 'Strongly Agree' for *high*). The scale items are as per Table 5.

Table 5 – Scales for the interactive profit-planning construct

SNR-FRQ	***Senior management interaction frequency***
snrfrq1	*Senior managers meet and discuss profit-planning information very frequently (e.g., weekly)*
snrfrq2	*Senior managers are continually involved in profit-planning activities*
snrfrq3	*Senior managers constantly interact with peers in profit-planning activities*
snrfrq4	*Senior managers very often attend presentations of profit-planning information*
MID-FRQ	***Senior and middle management interaction frequency***
midfrq1	*Middle managers constantly interact with senior managers in profit-planning activities*
midfrq2	*Middle managers very often present profit-planning information to senior managers*
midfrq3	*Middle and senior managers meet and discuss profit-planning information very frequently (e.g., weekly)*
midfrq4	*Middle managers are continually involved in profit-planning activities with senior managers*
CHALL	***The degree of face-to-face challenge and debate of profit-planning information***
chall1	*Profit-planning meetings always include consideration of multiple alternatives and scenarios*
chall2	*Profit-planning meetings always investigate progress made for delivering on expectations*
chall3	*Every profit-planning meeting involves intensive review and revision of action plans*
chall4	*Every profit-planning meeting has in-depth discussion of why results differ from expectations*
STRAT	***The degree of focus upon strategic uncertainties***
strat1	*Significant business development opportunities are a key focus in every profit-planning meeting*
strat2	*Strategic business changes are always assessed in profit-planning meetings*
strat3	*Business critical threats are always an important discussion point in profit-planning meetings*
strat4	*The sustainability of our business strategies is a key theme in profit-planning meetings*

Competitive advantage (*COMP-ADV*)

Competitive advantage was operationalized as superior performance relative to competitors (Newbert, 2007). Relative measures also control for differences in performance that are due to industry, environment, and strategy effects (Govindarajan & Fisher, 1990). Respondents were asked to rate their business unit's performance over the past two years, relative to rivals, for three reflective indicators: profitability; sales growth and market share. Nine point-Likert type scales were used (1 = 'Much Worse' for *low*, 9 = 'Much Better' for *high*).

Initial data analysis

Kolgomorov-Smirnov tests and charting analysis revealed the dataset as not normally distributed. Accordingly a Spearman's correlation matrix was produced, as per Table 6. Table 6 also reports the means and standard deviations for INTER, which have a theoretical range of 1 to 9.

Table 6: Correlations and descriptive statistics (raw scores and averages)

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*17*	*18*	*19*	*20*
1. snrfrq1	5.81	2.49																				
2. snrfrq2	6.97	1.82	.60																			
3. snrfrq3	6.45	1.89	.49	.57																		
4. snrfrq4	6.35	2.00	.44	.53	.58																	
5. midfrq1	5.93	2.13	.68	.56	.56	.44																
6. midfrq2	5.84	2.06	.41	.40	.45	.44	.62															
7. midfrq3	4.90	2.26	.70	.47	.53	.40	.65	.55														
8. midfrq4	5.58	2.05	.45	.51	.60	.52	.66	.66	.59													
9. chall1	6.20	1.82	.32	.52	.37	.35	.37	.37	.33	.40												
10. chall2	6.88	1.63	.45	.57	.55	.51	.52	.54	.44	.49	.39											
11. chall3	5.82	1.93	.42	.48	.46	.37	.38	.41	.44	.45	.42	.50										
12. chall4	6.58	1.92	.41	.55	.52	.47	.43	.44	.42	.49	.47	.63	.57									
13. strat1	6.61	1.76	.26	.47	.43	.35	.33	.35	.30	.36	.46	.41	.43	.31								
14. strat2	6.43	1.87	.28	.41	.44	.35	.33	.33	.29	.35	.39	.43	.52	.39	.47							
15. strat3	6.59	1.91	.35	.42	.53	.41	.39	.32	.33	.38	.39	.47	.42	.43	.44	.55						
16. strat4	6.59	1.89	.35	.41	.46	.36	.31	.27	.35	.32	.36	.45	.50	.50	.38	.51	.55					
17. snr-frequency	6.40	1.65	.84	.79	.79	.74	.72	.52	.69	.63	.45	.62	.53	.59	.43	.43	.51	.48				
18. mid-	5.56	1.82	.67	.57	.63	.52	.86	.82	.84	.84	.43	.58	.49	.52	.39	.38	.42	.37	.76			
19. challenge	6.37	1.47	.49	.66	.59	.52	.53	.55	.51	.57	.71	.75	.80	.85	.51	.54	.51	.56	.68	.63		
20. strategic	6.55	1.46	.39	.53	.59	.46	.43	.41	.40	.45	.49	.55	.58	.51	.70	.79	.79	.78	.58	.50	.66	
21. interactive	6.22	1.38	.72	.74	.75	.65	.77	.69	.74	.75	.58	.71	.68	.70	.57	.58	.62	.60	.89	.87	.85	.76

n = 307. All correlations are significant at $p < 0.01$. The mean (M) has a theoretical range of 1-9.

Test procedure 1: factor analyses (research question 1)

As the first step, exploratory factor analysis (EFA), with principal components analysis was performed in SPSS 21 (Netemeyer, et al., 2003). The EFA produced a single factor structure. Next, confirmatory factor analysis (CFA) was performed in AMOS SEM. As per Table 7, six alternative CFA models were assessed: single-factor (as per the EFA); two-factor; 2nd-order two-factor; four-factor; 2nd-order four-factor; and bifactor.[4]

Table 7: Interactive profit-planning - confirmatory factor analyses

Model	χ^2	*df*	$\chi^{2/df}$	RMSEA	CFI	GFI
1. One-factor model	577.96***	103	5.61	0.12	0.83	0.79
2. Two-factor model	452.27***	102	4.43	0.11	0.88	0.84
3. 2nd order model two-factor	577.97***	103	5.61	0.12	0.83	0.79
4. Four-factor model	324.42***	97	3.34	0.09	0.92	0.89
5. 2nd order model four-factor	346.86***	99	3.50	0.09	0.91	0.88
6. Bifactor model	290.91***	97	3.00	0.09	0.93	0.90

n = 307 *** $p < 0.001$.

In Table 7, four common fit indices are reported to assess and compare the fit of the models: the chi-square (χ^2) goodness-of-fit statistic, root mean square error of the approximation (RMSEA), comparative fit index (CFI) and goodness-of-fit index (GFI) (Byrne, 2010). Notably, the fit of each of the five CFA models is negatively affected by the complexity of the models in the context of a relatively small sample size, the high inter-item and inter-factor correlations, and non-normal data. The maximum likelihood estimation procedure was used, because, even though the dataset violates its assumption of multivariate normality, it is the best suited procedure for our small sample size (Muthen and Kaplan, 1992).

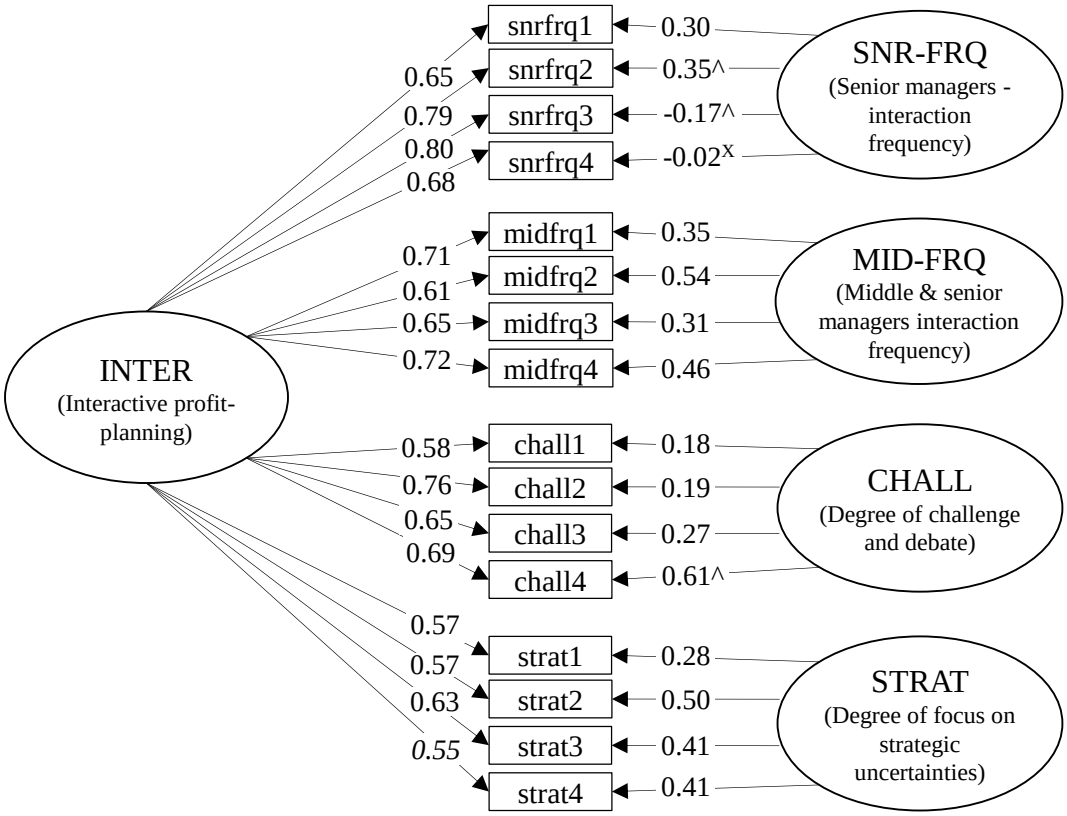
As per Table 7, the one-factor, two-factor and second-order two-factor models each have 'poor fit' (Byrne, 2010). The four-factor, second-order four-factor, and bifactor models each have 'marginally adequate/mediocre fit' (Byrne, 2010). The bifactor model is the best-fitting and is shown in Figure 2. Similar to a second-order model, a bifactor model enables the estimation of a general factor and specific factors simultaneously (Gibbons & Hedeker, 1992; Reise, Moore, & Haviland, 2010; Reise, 2012). However, unlike a second-order model, a bifactor model allows all items to load directly on an overall general factor (e.g., INTER) as well as on domain-specific factors (e.g., SNR-FRQ, MID-FRQ, CHALL and STRAT). A bifactor model uniquely allows the measurement of a single common latent trait, but also models and thus controls for the variance that arises due to additional common factors (Reise et al., 2010). Thus, a bifactor model allows the exploration of the extent to which items reflect a common target trait and the extent to which they reflect a primary or subtrait (Reise et al., 2010).

In the bifactor model (Figure 3) each of the 16 measurement items load much more strongly on the overall general trait INTER than upon a sub-trait. This is contradictory to the 'choice' perspective whereby the main defining feature of INTER is 'the amount of top management involvement in the MCS'. For that proposition to have been supported, the factors that

[4] For all CFA models, the covariance between the error terms for *snrfrq1* and *midfrq3* was freed on the substantive grounds (Byrne, 2010) of the strong conceptual overlap of the two question items (both questions refer to 'weekly').

represent ‘the amount of top management involvement’ (i.e., SNR-FRQ and MID-FRQ) would not load so relatively strongly on the general factor (INTER). Instead, a ‘social learning’ perspective is supported, because all 16 measures lead more strongly on the general overall trait INTER. The four dimensions are conjoined, reflecting a distributed social learning system.

Figure 3: Bifactor model for interactive profit-planning



n = 307.
Loading marked X is not significant at $p < 0.10$.
Loadings marked ^ are significant at $p < 0.10$.
All other loadings are significant at $p < 0.001$.

Test procedure 2: PLS path modelling (research question 2)

In this section we report on a PLS path model that examines how the four dimensions of INTER relate to competitive advantage (COMP-ADV). PLS path modeling is appropriate for this task because of the non-normal dataset (Chin, 1998). PLS uses very general soft distributional assumptions and non-parametric prediction-orientated model evaluation measures (Chin, 1998). The PLS procedure also provides a comprehensive series of validity and reliability assessments, as we next report upon (Chin, 1998, 2010).

Construct measurement model evaluation

Chin's (2010) guidelines for reporting on PLS analyses are followed. The adequacy of reflective measurement models is examined via; (1) individual item reliability, (2) convergent validity, and (3) discriminant validity (Chin, 1998). First, individual item reliability is assessed by examining the loading of an item on its construct. In Table 8, all loadings are above 0.70 (Chin, 1998). Hence, there are no concerns with individual item reliability. Second, for convergent validity: all Cronbach alphas are much greater than 0.70 (Chin, 1998). All composite reliability measures are much greater than 0.70 (Chin, 1998). All average variances extracted (*AVE*) are higher than 0.50 (Chni, 1998). Hence, there are no concerns with convergent validity. Third, for assessing discriminant validity, as per Table 8, no indicator correlates higher on a latent variable other than the one it is intended to measure (Chin, 1998), and also the values of the square root of *AVE* are higher than all correlations between each construct and all other constructs (Chin, 1998). Hence, the requirements for discriminant validity are fully met.

Table 8: Reliability and validity assessments

	SNR-FRQ	MID-FRQ	CHALL	STRAT	COMP-ADV	Loadings
snrfrq1	**0.75**	0.67	0.51	0.40	0.17	0.75
snrfrq2	**0.83**	0.60	0.68	0.55	0.18	0.83
snrfrq3	**0.84**	0.64	0.62	0.62	0.25	0.84
snrfrq4	**0.79**	0.55	0.55	0.48	0.21	0.79
midfrq1	0.71	**0.88**	0.56	0.44	0.25	0.88
midfrq2	0.55	**0.83**	0.56	0.42	0.16	0.83
midfrq3	0.65	**0.84**	0.53	0.44	0.20	0.84
midfrq4	0.67	**0.88**	0.60	0.47	0.20	0.88
chall1	0.50	0.46	**0.73**	0.52	0.19	0.73
chall2	0.68	0.61	**0.84**	0.61	0.22	0.84
chall3	0.56	0.52	**0.79**	0.61	0.21	0.79
chall4	0.63	0.53	**0.86**	0.52	0.16	0.86
strat1	0.49	0.43	0.53	**0.75**	0.31	0.75
strat2	0.49	0.41	0.55	**0.81**	0.29	0.81
strat3	0.57	0.44	0.56	**0.82**	0.28	0.82
strat4	0.48	0.35	0.58	**0.77**	0.28	0.77
flex1	0.41	0.33	0.40	0.47	0.48	0.85
flex2	0.36	0.31	0.39	0.41	0.37	0.79
flex3	0.26	0.28	0.28	0.32	0.30	0.71
flex4	0.50	0.45	0.54	0.54	0.35	0.86
flex5	0.45	0.41	0.46	0.45	0.38	0.84
flex6	0.43	0.34	0.42	0.41	0.35	0.81
mark-share	0.21	0.20	0.22	0.31	**0.91**	0.91
profit	0.24	0.22	0.21	0.35	**0.84**	0.84
sales	0.22	0.21	0.21	0.30	**0.90**	0.90
Comp. reliab.	0.88	0.92	0.88	0.87	0.91	
AVE	0.65	0.73	0.65	0.62	0.78	
Cronbach	0.82	0.88	0.82	0.80	0.86	

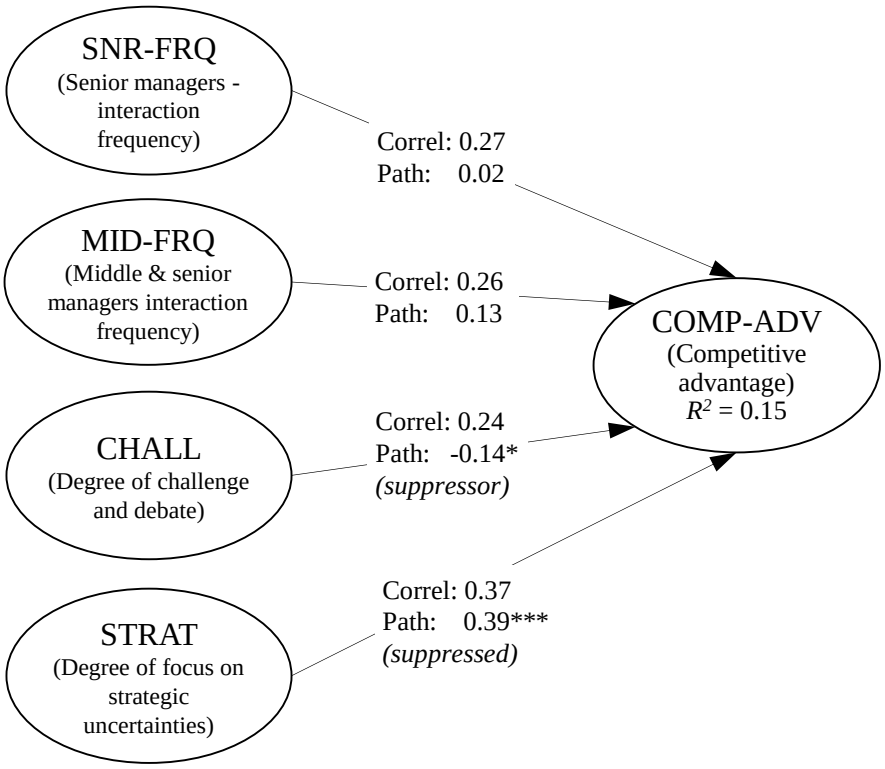
Path model analysis

Given that the goodness of fit for the bifactor model was acceptable, relationships of the specific factors/traits (i.e.., dimensions) with other variables can be studied independently of the general trait (Chen et al., 2006). Referring to Figure 4, the finding for research question 2 comes from analyzing the relationships of the four dimensions with COMP-ADV. Only STRAT is a significant predictor of COMP-ADV, and it is negatively suppressed by CHALL[5]. SNR-FRQ and MID-FRQ are not significant predictors of COMP-ADV, nor are

[5] Suppression is a phenomenon in multiple regression analysis and generally denotes a situation in which "a variable (…) increases regression weights and, thus, increases the predictive validity of other variables in a regression equation" (Conger 1974, 36-37). For path models, suppression is evident when the explanatory variables are scaled such that the zero-order correlations with the dependent variable are positive and a path coefficient of an explanatory variable is: (1) larger than its zero-order correlation with the dependent variable, or (2) less than zero (Cohen et al., 2003). Suppressor variables increase the predictive validity of another variable or set of variables (Conger, 1974; MacKinnon, Krull, & Lockwood, 2000) by partialling out invalid variance of the other predictors they are correlated with and revealing the true relationships between the dependent and independent variables (Jose, 2013; Pandey & Elliot, 2010; Rucker et al., 2011).

they suppressor variables (including as per unreported hierarchical analysis). The path model and correlations analysis are interpreted to mean that the driving feature of value creation from interactive profit-planning is a 'focus on strategic uncertainties' (STRAT), for which there needs to be 'face-to-face challenge and debate' (CHALL).

Figure 4: Path model and correlations analyses



n = 307.
All correlations are significant at $p < 0.01$ (two-tailed).
Significance levels for paths: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (one-tailed).

RESULTS SUMMARY AND DISCUSSION

Research question 1 asked whether, for interactive profit-planning, is top management involvement: (a) a sufficient condition (as per 'choice'), or (b) a necessary but insufficient condition (as per 'social learning')? The empirical investigation rests on the bifactor model. A bifactor model allows the exploration of the extent to which items reflect a common target trait and the extent to which they reflect a primary or subtrait (Reise et al., 2010). In the bifactor model (Figure 3) each of the 16 measurement items load much more strongly on the overall general trait INTER than upon a sub-trait. This is contradictory to the 'choice' perspective whereby the main defining feature of INTER is 'the amount of top management involvement in the MCS'. For that proposition to have been supported, the factors that represent 'the amount of top management involvement' (i.e., SNR-FRQ and MID-FRQ) would not load so relatively strongly on the general factor (INTER). If top management involvement was a sufficient condition for interactive profit-planning, the common trait would not be where these respective measures would most strongly load. Instead, a 'social learning' perspective is supported, because all 16 measures lead more strongly on the general overall trait INTER. The four dimensions are conjoined, reflecting a distributed social learning system.

Research question 2 asked: what is/are the most valuable (i.e., competitively advantageous) dimension/s of interactive profit-planning? The PLS path model analyses reveal that when all four dimensions are included in a multiple regression with competitive advantage as the dependent variable, dimensions 1 and 2 (top management involvement) are not statistically significant, whereas dimensions 3 and 4 have a suppression effect dynamic that is supportive of a social learning perspective. Analytically, the involvement of top and middle managers is a necessary but insufficient condition for this suppression effect dynamic. It is not the top management involvement in interactions that are of consequence, but the collective strategy debate (emergent strategy-making) that occurs in them.

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