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Toward a dynamic process model of entrepreneurial networking under uncertainty

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ABSTRACT

Although research has begun to acknowledge the strategies by which entrepreneurs form and maintain network ties, most efforts to date present an incomplete picture of entrepreneurs as heroic network architects who search, plan, and pursue contact with targeted ties. Herein, we briefly review this nascent literature, argue that it has so far overlooked alternatives in favor of an overly planned and instrumental perspective, and consider the implications of incorporating the notion of uncertainty into investigations of how entrepreneurs engage in networking. We therefore take a novel perspective on entrepreneurial networking and theorize about how entrepreneurs act when desired ties cannot be identified in advance, networking outcomes cannot be predicted, and ongoing social interactions fuel the emergence of new objectives. Overall, we add important insights to the literature, as we flesh out a dynamic networking process that unfolds alongside efforts to create a new venture. We then discuss how this model, which highlights distinctive elements such as altruism, pre-commitment, serendipity, and co-creation, can stimulate a broader research agenda focused on the inquiry of networking agency under uncertainty.

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Executive summary

There is little doubt that entrepreneurs can and do shape their network structures by forming and reforming ties with other people. Indeed, research shows that what entrepreneurs do to shape their personal networks matters for the creation and discovery of opportunities, the mobilization of resources, and the formation of inter-organizational partnerships. However, in moving away from an earlier metaphor of entrepreneurs as passive sailors stranded in the shallow waters of their existing network structures, scholars have opted for an equally problematic view of entrepreneurs as heroic captains charting a route to acquire pre-defined networking targets. This refocus of research on networking agency did not only underplay the role of network structure but has come at the expense of attention to the fact that entrepreneurial agency is agency under uncertainty. In other words, to the extent that networking processes are entrepreneurial they are bound to involve unpredictability, goal ambiguity, and an interactive environment that keeps changing with every action.

This raises a series of theoretically important and practically relevant questions: How can entrepreneurs network strategically when the future is unpredictable? How can they intentionally target desired ties when their own goals are underspecified and/or their preferences unordered? And how can they plan tie formation when every networking action alters the information on which such plans are based? In sum, how do entrepreneurs engage in networking under uncertainty?

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We address this key question by suggesting the role of uncertainty as a critical boundary condition on how entrepreneurs form and maintain network ties. Instead of portraying entrepreneurs as either completely passive actors or downright calculative networkers, we suggest paying more attention to the notion of uncertainty and how it acts to both constrain and enable alternative forms of networking agency. We thus identify, evaluate, and challenge existing assumptions by drawing on insights from discovery and creation theories of entrepreneurial action. In doing so, we particularly focus on effectuation – a logic of action under uncertainty – to provide more detail about how entrepreneurs generally act under uncertainty. Unlike the limited focus of prior research on resource seeking and instrumental networking behaviors, we give room for a host of other motivations and recast networking as an activity conducive to the generation and transformation of venture ideas. Accordingly, we propose that entrepreneurial networking requires a more altruistic approach to interpersonal interactions and openness to unexpected contingencies as networking activities stimulate serendipitous goal formation and transformation. In essence, our dynamic process model of entrepreneurial networking specifically addresses situations where goal-directed approaches are simply not an option, and, arguably, these situations are extremely ubiquitous in entrepreneurship.

Overall, our study contributes to both network theory and entrepreneurship theory by offering a novel conceptualization of entrepreneurial networking that does not only stipulates when or how networking will lead to entrepreneurial action but rather that networking is entrepreneurial action. Whereas received networking studies have focused on how entrepreneurs may efficiently reach their goals by targeting desired ties, our model highlights how, under uncertainty, networking increasingly becomes an activity from which these goals emerge in the first place. This also links to and extends research about the integration of psychological and network perspectives in entrepreneurship as the position we take here aims to encourage more research on the dynamic and reciprocal influence between individual cognition and actions, social networks, and entrepreneurial outcomes. Put simply, by taking uncertainty into account, we illuminate an overlooked but extremely relevant part of entrepreneurial networking. We therefore both challenge and complement the prevailing view on networking agency and believe that by doing so, entrepreneurial network research can be greatly enriched.

1. Introduction

> *"Call it the Law of Unexpected Utility. By definition, you cannot know when you meet someone today where that person will land tomorrow. If you make every decision by asking 'What will I get in return?' you'll miss out on these moments of serendipity".*
>
> [Grant (2015)]

Surging research interest in what entrepreneurs do to shape their personal networks signifies scholars' efforts to break away from earlier deterministic accounts of tie[1] formation (for a review and critique see Emirbayer and Goodwin, 1994; Gulati and Srivastava, 2014; Hoang and Antoncic, 2003; Porter and Woo, 2015; Stuart and Sorenson, 2007). Entrepreneurs are no longer seen as passive actors "hemmed in by the inertial forces of prior network structure" (Vissa, 2012: 492) but rather as reflexive agents who "actively shape their approach to tie formation through thoughtful agency" (Hallen and Eisenhardt, 2012: 36). For instance, research provides robust evidence that entrepreneurs' networking strategies (Baker et al., 2003; Hallen and Eisenhardt, 2012; Ozcan and Eisenhardt, 2009; Zott and Huy, 2007) as well as their constituent networking actions (Vissa, 2012) represent distinct mechanisms driving the creation and discovery of opportunities, the mobilization of resources, and the formation of inter-organizational partnerships.

To date, however, scholars who have adopted this agentic view (e.g., Hallen and Eisenhardt, 2012; Hite and Hesterly, 2001; Stuart and Sorenson, 2007; Vissa, 2011; Zott and Huy, 2007) have also inherited a stifling assumption, namely, that entrepreneurs are goal-driven and planned in their attempts to efficiently target and maintain specific valuable connections (Emirbayer and Mische, 1998; Klyver et al., 2011; Porter and Woo, 2015). For instance, Stuart and Sorenson (2007: 211) contend that "most entrepreneurs and young ventures are strategic in their formation of relations", while Vissa (2011) applies Ajzen's (1991) theory of planned behavior to argue that potential ties are screened based on a priori matching criteria, and Hallen and Eisenhardt (2012) introduce efficient networking strategies by which entrepreneurs deliberately target desired ties. Current discussions of agency in entrepreneurial networking therefore echo traditional theories of entrepreneurial action in presenting an instructive—yet incomplete—picture of entrepreneurs as heroic architects who strategically search, plan, and pursue their pre-defined goals (Alvarez and Barney, 2007; Baker et al., 2003; Sarasvathy, 2001; Shah and Tripsas, 2007).[2]

Concurrently, the assumptions required by such "design-precedes-execution" models have been the subject of increasing criticism, particularly because they refer to entrepreneurial agency, that is, action in the presence of *uncertainty* (Alvarez and Barney, 2007; Baker et al., 2003; Burns et al., 2015; Klyver et al., 2011; McMullen and Shepherd, 2006; Sarasvathy, 2001; Sarasvathy, 2008). Rather than acting on risky situations in which only the probabilities of likely decision outcomes are unknown, for entrepreneurs, even the information needed to anticipate the outcomes themselves is frequently unavailable (Alvarez and Barney, 2007; Knight, 1921; McMullen and Shepherd, 2006). In a nutshell, entrepreneurial action under uncertainty is often the equivalent of "chasing an invisible moving target" (Huang and Pearce, 2015: 3). Hence, to the extent that networking processes are embedded in venturing processes, they are bound to involve unpredictability, goal ambiguity, and an interactive environment that keeps changing with every action (Alvarez and Barney, 2007; Burns et al., 2015; Miller, 2007; Sarasvathy, 2008).

[1] We use the terms "tie", "contact", "relation", and "stakeholder" interchangeably to refer to the alter with which the entrepreneur (ego) is establishing a social and/or business connection.

[2] This perspective is more generally referred to as the "classic model of entrepreneurship" by Shah and Tripsas (2007), the "discovery approach" by Alvarez and Barney (2007), "design-precedes-execution" by Baker et al. (2003), and "causation" by Sarasvathy (Sarasvathy, 2001).

From a theoretical standpoint, this raises a simple but surprisingly overlooked question: *How do entrepreneurs engage in networking under uncertainty?* Or to paraphrase Sarasvathy (Sarasvathy, 2008: 70): How can entrepreneurs network strategically when the future is unpredictable? How can they intentionally target desired ties when their own goals are underspecified and/or their preferences unordered? And how can they plan tie formation when every networking action alters the information on which such plans are based?

In this article, we address these questions by suggesting that the extent to which entrepreneurs are indeed calculative and instrumental networkers is limited by the ubiquity of uncertainty as a critical boundary condition. In particular, we identify, evaluate, and challenge existing assumptions (Alvesson and Sandberg, 2011) by drawing on insights from "discovery" and "creation" theories of entrepreneurial action (Alvarez and Barney, 2007; Alvarez et al., 2013; Miller, 2007). We then consider the implications of incorporating uncertainty into investigations of how entrepreneurs form and maintain network ties. In doing so, we focus on effectuation (Sarasvathy, 2001)—a logic of action consistent with the assumptions of creation theory—to provide more detail about how entrepreneurs generally act under uncertainty. This combination of conceptual lenses (Okhuysen and Bonardi, 2011) allows us not only to draw parallels between how entrepreneurs network and a range of other entrepreneurial behaviors under uncertainty but also to flesh out an effectual networking strategy as a distinctively entrepreneurial process of endogenous network change.

Overall, our study contributes to both network theory and entrepreneurship theory by offering a novel conceptualization of entrepreneurial networking that does not only stipulates when or how networking *will* lead to entrepreneurial action (e.g., Autio et al., 2013), but rather that networking *is* entrepreneurial action. Whereas received networking studies have focused on how entrepreneurs may efficiently reach their goals by targeting desired ties, our model highlights how, under uncertainty, networking increasingly becomes an activity from which these goals emerge in the first place. In particular, this requires a more altruistic approach to interpersonal interactions and openness to unexpected contingencies as networking activities stimulate goal formation and transformation. We thus complement and extend current models of entrepreneurial networking with uncertainty as a critical boundary condition, which serves to illuminate a completely new angle on how and why entrepreneurs engage in networking (cf. Porter and Woo, 2015). In doing so we offer strong theoretical grounding for future research.

This contribution to theory stems from investigating a new angle of the under-explored origins of entrepreneurial networks (Stuart and Sorenson, 2007) and from theorizing about the highly relevant role of uncertainty in shaping networking processes (Alvarez and Barney, 2007; Burns et al., 2015; McMullen and Shepherd, 2006; Miller, 2007; Slotte-Kock and Coviello, 2010). This is in line with recent conceptualizations of networking as constrained agency (Bensaou et al., 2014; Gulati and Srivastava, 2014) and consistent with calls positioning the influence of cognition on networking behavior as an unusually promising avenue for inquiry (Casciaro et al., 2015; Hallen and Eisenhardt, 2012; Porter and Woo, 2015; Vissa, 2012). We also contribute to entrepreneurship research more broadly by highlighting an interactive and pro-social conception of networking (Shepherd, 2015) that challenges implicit assumptions (Alvesson and Sandberg, 2011) about why and how entrepreneurs create and maintain network ties. Finally, our work adds to research on the behavioral outcomes of effectuation as it relates to networking at the interpersonal level—an issue that has already triggered some lively debates (e.g., Arend et al., 2015; Goel and Karri, 2006; Karri and Goel, 2008; Read et al., 2015; Sarasvathy and Dew, 2008). We build on these contributions to provide propositions that scholars may use as part of a larger research agenda aimed at enriching our understanding of how entrepreneurs develop their social networks under uncertainty.

2. What is entrepreneurial networking?

Entrepreneurial networking generally refers to what entrepreneurs do in creating and shaping network ties and may therefore include tie formation and maintenance behaviors as well as any assemblage of such behaviors into unique networking styles, strategies or processes (Bensaou et al., 2014; Porter and Woo, 2015; Vissa, 2012). Emerging as a response to overly structural accounts of entrepreneurs' networks, this view of individual actors as drivers of network change advances the study of social networks as dynamic entities (Emirbayer and Goodwin, 1994; Hoang and Antoncic, 2003; Slotte-Kock and Coviello, 2010; Stuart and Sorenson, 2007). This research is therefore particularly insightful in redirecting our attention to the possibility that entrepreneurs can, and often do, break away from their existing network structures (Ahuja et al., 2012; Hallen and Eisenhardt, 2012; Porter and Woo, 2015). Given the widely acknowledged primacy of social networks in every aspect of the entrepreneurial process—from opportunity discovery and creation, through venture legitimation and resource mobilization, to venture growth—understanding why, when and how entrepreneurs engage in networking has become a major research priority (Hoang and Antoncic, 2003; Stuart and Sorenson, 2007; Tasselli et al., 2015).

Consequently, Stuart and Sorenson (2007), Vissa (2012; 2011) and others (Hallen and Eisenhardt, 2012; Ozcan and Eisenhardt, 2009; Vissa and Bhagavatula, 2012; Zott and Huy, 2007) have paved the way for a growing stream of studies that pay special attention to networking behaviors under the central assumption of entrepreneurs as active agents. Throughout these studies, tie formation is understood as a strategic issue for which entrepreneurs must take action and thoughtfully maneuver their social environment. Table 1 provides a brief overview[3] and definitions of various network actions and strategies as conceptualized in extant literature.

3. Revisiting underlying assumptions in the study of entrepreneurial networking

Alvesson and Sandberg (2011) suggested a powerful methodology for generating new theory by problematizing extant theoretical assumptions. In following their recommendations, we now revisit the underlying assumptions in studies modeling entrepreneurial networking behavior. As a way to meaningfully engage with this literature, we are guided by advances in the study of

[3] Because the networking literature has been the subject of several recent reviews, we offer only an abbreviated review here that focuses exclusively on entrepreneurial networking. See Casciaro et al. (2015), Landis (2015), Porter and Woo (2015), and Tasselli et al. (2015) for more extensive treatments.

Table 1
Definitions of networking actions and strategies.

Source	Networking action	Definition
Vissa (2012)	Reaching out to new alters	The extent to which entrepreneurs actively try to meet new potential partners to promote their venture
	Establishing interpersonal knowledge of alters	The extent to which entrepreneurs find out more about the new people they meet
	Time-based interaction pacing	The extent to which entrepreneurs pace interactions with relations based on temporal markers
	Relational embedding	The extent to which entrepreneurs seek to combine social and business ties
	Network preserving	The extent to which entrepreneurs try to preserve every relation
Hallen and Eisenhardt (2012)	Casual dating	Informal deliberate meetings with potential ties prior to tie formation
	Timing around proof points	Signaling potential ties of third-party confirmation of critical accomplishment
	Scrutinizing interest	Actions to discern potential partners' actual interest in a tie
	Crafting alternatives	Developing multiple routes to end the tie formation process
Zott and Huy (2007)	Symbolic credibility	Symbolically displaying personal capability and commitment
	Symbolic organizing quality	Drawing attention to the professional nature of organizing successes and processes
	Symbolic achievement	Symbolically emphasizing preliminary and interim achievements
	Symbolic relationship quality	Drawing symbolically on their associates' prestige to acquire resources and giving personal attention to potential stakeholders
Ozcan and Eisenhardt (2009)[a]	Active foresight	Defining portfolios that have a unique interdependence advantageous to the focal firm and its partners
	Opportunistic maneuvering	Expanding a firm's portfolio to more-distant parts of the network
	Defensive positioning	Defending against emerging industry uncertainties by adding multiple ties around them
Ebbers (2014)	Individual networking orientation	The propensity to actively form ties in expectation of future professional benefit
	Tertius iungens orientation	The propensity to facilitate tie formation among (disconnected) individuals when these other individuals might benefit from one another

[a] This study conceptualized networking as a firm-level activity.

entrepreneurial action more generally, where scholars emphasize that any theoretical claim about what entrepreneurs do should include a clear demarcation of its boundary conditions concerning the nature of the context and the nature of the motivation to take action (Alvarez and Barney, 2007, 2010; Alvarez et al., 2013). This is because even if the image of entrepreneurs as powerful agents cuts across competing theories of entrepreneurial action, these particular assumptions often generate different predictions about the boundaries of that agency (Miller, 2007). For instance, Alvarez and Barney (2007) demonstrate that dissimilar assumptions produce distinctive implications for how entrepreneurs act in seven arenas (leadership, decision-making, human resource practices, strategy, finance, marketing, and sustaining competitive advantages). Similarly, existing conceptualizations of networking actions as outlined above lend themselves to an analysis of these key assumptions (summarized in Table 2).

3.1. Goal-directed networking: Entrepreneurial action as a discovery process

Collectively, much of the work taking an agentic view of networking is positioned vis-à-vis prior deterministic accounts and therefore builds on a set of underlying assumptions that characterize entrepreneurs as powerful actors capable of intentional search and purposeful networking action. Hence, entrepreneurial networking is emphasized as a linear process in which entrepreneurial volition, based primarily on rational self-interest (e.g., resource seeking), leads to goal setting and planning activities (e.g.,

Table 2
Studies of entrepreneurial networking and their underlying assumptions.

Source	Main research question	Nature of motivation to engage in networking	Nature of networking context
Vissa (2011)	What are entrepreneurs' intentions when adding new ties to their personal networks?	Rational self-interest with both instrumental and homophilous motives (resource-seeking and interpersonal attraction) based on task complementarity and social similarity	Risky (assumes ex-ante knowledge about the goal and outcome of networking)
Vissa (2012)	What are the effects of entrepreneurs' interpersonal networking style on exchange partner search?	Rational self-interest with predominantly instrumental motives (resource-seeking)	Ignored the issue
Hallen and Eisenhardt (2012)	What are the strategies by which entrepreneurs efficiently form investment ties?	Rational self-interest with predominantly instrumental motives (resource-seeking), where desired ties are defined as resource providers	Risky (assumes ex-ante knowledge about the goal and outcome of networking)
Zott and Huy (2007)	What are the symbolic actions that facilitate resource acquisition from network partners?	Rational self-interest with predominantly instrumental motives (resource-seeking), where target ties are investors, employees, associates or customers	Risky (assumes ex-ante knowledge about the goal and outcome of networking)
Ozcan and Eisenhardt (2009)	How do firms originate high-performing alliance portfolios?	Rational self-interest with predominantly instrumental motives (resource-seeking)	Risky (assumes ex-ante knowledge about the goal and outcome of networking)
Ebbers (2014)	What are the effects of entrepreneurs' networking behaviors on tie formation?	Both rational self-interest (individual networking orientation) and altruistic[b] motivations (Tertius iungens orientation).	Ignored the issue

[b] While Ebbers (2014: 6) theoretically discusses Tertius Iungens orientation as "selfless behavior", his construct operationalization did not account for the motivation to network.

targeting a "desirable" partner), which, in turn, lead to purposeful action to achieve previously predicted outcomes (e.g., "efficient" tie formation). This echoes Porter and Woo's (2015: 3) recent review of the networking literature more broadly, in which they find that research "tacitly conceptualizes networking as a specific goal-directed activity". However, even more importantly, this is congruent with what Alvarez and Barney (2007) refer to as a "discovery view" of entrepreneurship—a general model of action leading from search and planning to execution, all under a risky (rather than uncertain) context and clear (rather than ambiguous) motivational goals (Alvarez and Barney, 2007; Alvarez et al., 2013).

For example, in their articulation of four catalyzing strategies for efficient tie formation, Hallen and Eisenhardt (2012) elaborate on ways by which entrepreneurs systematically scan their environment for potential ties, collect relevant information about them, and reduce the level of risk involved in approaching a stranger by anticipating the possible outcomes of their interaction. This point is illustrated clearly when the authors describe what they call "preemptive structuring of timing around proof points". Here, entrepreneurs anticipate and attempt to synchronize a future tie formation effort with a future milestone in the development of their product or service (Hallen and Eisenhardt, 2012). Evidently, some information about who will be the target tie must be known in advance, and some level of foresight is required for such a synchronized effort to become viable.

An immediate consequence of dealing with risk rather than uncertainty is that at least some objectives for each action can be set a priori (Miller, 2007). For instance, current conceptions of networking tend to be instrumental in nature, as actions are organized around a relatively stable goal such as receiving investment (Hallen and Eisenhardt, 2012) or seeking other venture resources (Zott and Huy, 2007). This positions rational self-interest as a core motivator and forcefully frames networking actions as a means to a personal end (Casciaro et al., 2014; Folger and Salvador, 2008; Van de Ven et al., 2007). This unwarranted bias holds even when entrepreneurs act to acquire interpersonal knowledge of their alters, or reaching out to new alters (Vissa, 2012), as long as the goal for their interaction is predetermined as instrumental in nature, that is, the person initiating the contact is seen to do so with a specific, foreknown goal of obtaining immediate benefits for themselves or their ventures (Casciaro et al., 2014). Hence, the strategies entrepreneurs use to manage their networking activities are planned insofar as they follow a causal logic in which goals (e.g., receiving investment) are fixed, and the focus is on selecting among the means (e.g., efficient tie formation activities) to achieve the goals. Notably, this pattern is no different when authors ascribe to entrepreneurs primarily homophilous motives such that new network relationships are assumed to be based on considerations of social similarity (e.g., Vissa, 2011). Such reduction of human motivation to self-interest while ignoring other determinants of how people behave is not a new theme in management discourse (Folger and Salvador, 2008), but this imbalance is especially visible against the backdrop of a topic as distinctively social as networking.

Still, in light of this discussion of the intentional and planned character of entrepreneurial networking theories to date, it is also important to note some exceptions.[4] In conceptualizing his networking actions, Vissa (2012) chose to be largely agnostic to such motivational assumptions and ignored the context in which networking is done or the objectives toward which entrepreneurs form and maintain ties. Instead, Vissa (2012) describes networking actions more neutrally in terms of what entrepreneurs do and remains silent about their underlying motives. This type of position is reminiscent of a larger stream of studies that Porter and Woo (2015) classify as dealing with "networking as behavior" (e.g., Forret and Dougherty, 2001; Wolff and Moser, 2009). Across these studies, the focus is on what people do when networking without specifying a goal for these activities. As a result, every one of Vissa's (2012) actions can be discussed in relation to a predetermined goal (e.g., reaching new alters for forming investment ties) or to a goal that might emerge in the process of interaction (e.g., first reaching new alters and then establishing the purpose). Acknowledging this limitation, Vissa (2012) calls for future research to "examine the extent to which these networking actions are learned behaviors versus based on a forward-looking planned logic" (Vissa, 2012: 507). Unlike Vissa, Ebbers (2014) does state that individuals who engage in networking behaviors associated with Tertius Iungens Orientation (TIO) do so without expecting to benefit directly from their "selfless behavior" (6). However, this apparent concern with networking motivation remains theoretical, and in measuring the TIO construct, Ebbers (2014) does not directly test this assumption. Hence, although such contributions are highly informative in understanding what entrepreneurs do to change their networks, they still treat actors' motivations as a black box.

Overall, our review of the literature shows that notions of entrepreneurial agency in networking can be seen as consistent with a "discovery view" of entrepreneurship in assuming that entrepreneurial actions involve a degree of predictability that allows one to set specific networking goals (Alvarez and Barney, 2007; Alvarez et al., 2013). Even when there is no specific commitment to discovery assumptions (e.g., Ebbers, 2014; Vissa, 2012), studies modeling how entrepreneurs network do not offer an alternative to these restrictive views of a risky context and predetermined, instrumental objectives.

In what follows, we therefore outline a different set of assumptions that are more consistent with a "creation view" of entrepreneurial action (Alvarez and Barney, 2007; Alvarez et al., 2013; Miller, 2007) and with uncertainty as a ubiquitous constituent of entrepreneurship (McMullen and Shepherd, 2006; Sarasvathy, 2001). Moreover, we discuss the main tenets of effectuation (Sarasvathy, 2001) as a general logic of action that coheres with these alternative assumptions and thus serves as a baseline model of entrepreneurial action under uncertainty.

3.2. The uncertainty of entrepreneurial creation

In contrast to the discovery view that assumes a risky context in which some aspects of the future are known or at least can be uncovered (e.g., by trial and error), entrepreneurial agency can also be viewed as action under uncertainty (Alvarez and Barney, 2007;

[4] Other exceptions, in terms of assumptions different from goal-directed networking, can be found in previous work dealing with entrepreneurial networks from a process perspective (e.g., Anderson and Jack, 2002; Jack et al., 2010; Klyver et al., 2011; Larson, 1992; Larson and Starr, 1993; Slotte-Kock and Coviello, 2010). However, without a clear focus on and a detailed conceptualization of networking actions or strategies, these papers could not be meaningfully compared to the work we reviewed here.

Alvarez et al., 2013; Knight, 1921; McMullen and Shepherd, 2006; Miller, 2007; Welter et al., 2016). Indeed, as a logical theoretical alternative to the discovery perspective, the creation view of entrepreneurial action embraces uncertainty as its distinguishing characteristic (Alvarez and Barney, 2007; Alvarez et al., 2013; Welter et al., 2016). As uncertainty about the future is often exacerbated by the novelty intrinsic to the creation of new products, services, ventures and even markets, it is of no surprise that "uncertainty constitutes a conceptual cornerstone for most theories of the entrepreneur" (McMullen and Shepherd, 2006: 133).

Scholars in different fields have proposed multiple conceptualizations of uncertainty and even within writings about entrepreneurship one can find competing views of the term as borrowed from management, economics, and psychology literature (McKelvie et al., 2011; McMullen and Shepherd, 2006; Milliken, 1987). For example, following an extensive review of uncertainty in organization theory Milliken (1987) distinguishes between state, effect, and response uncertainty, each referring to a particular source of information that an individual may perceive to be missing. In elaborating empirically on this framework, McKelvie et al. (2011) shows that entrepreneurs experience state uncertainty when they perceive the business environment as unpredictable, whereas effect uncertainty is reflected in limited ability to predict how changes in the environment will influence the venture, and response uncertainty is the lack of knowledge about response options and/or the likely consequences of a particular response choice. In contrast, McMullen and Shepherd's (2006) define entrepreneurial uncertainty more broadly such that their concern is not with the source of missing information but rather with the impact that any missing information has on entrepreneurial action. For them, as long as uncertainty has any impact on action, the importance of determining which of Milliken's (1987) three forms of uncertainty is technically being discussed is diminished.

In order to simplify our theoretical buildup about entrepreneurial networking, we point to a more basic agreement about uncertainty as the "perceived inability to predict something accurately" (Milliken, 1987: 136). Thus, building on Frank Knight's (1921) classic definition, and following Alvarez and Barney (2007: 14) accessible formulation we subscribe to the view that uncertainty about a course of action is discerned "if, at the time a decision is being made, decision makers cannot collect the information needed to anticipate either the possible outcomes associated with a decision nor the probability of those outcomes". To this definition we also add McMullen and Shepherd's (2006) clarification as to the subjective nature of entrepreneurial uncertainty and hence that even in identical situations different individuals may experience uncertainty differently. In sum, uncertainty, as discussed in the current paper, is ultimately concerned with the power of temporality in drawing a veil over the future, thereby concealing preferences as well as outcomes (March, 1978; McKelvie et al., 2011; Milliken, 1987; Sarasvathy, 2008).

Following on the idea that some entrepreneurs, at least occasionally, operate under uncertainty as defined above, means that we must also revisit any related assumptions about the nature of entrepreneurial motivation and objectives, rendering goals as endogenous and tightly linked to ongoing actions (Alvarez and Barney, 2007; Alvarez et al., 2013; Miller, 2007; Sarasvathy, 2008). Accordingly, an uncertain informational setting may dictate an important reversal in means-ends relationships such that goals become the product of action rather than its predecessor (Sarasvathy, 2001). By leaving behind the idea that goals are fixed and foreknown, the notion of uncertainty further suggests that any presumption of rational self-interest in entrepreneurial action may be complemented or even replaced by the pursuit of pro-social, altruistic, and collective interests (Van de Ven et al., 2007). At the very minimum, when you do not know what the future will bring, it is much more difficult to set goals and plan actions with the sole purpose of maximizing self-interests (Simon, 1993; Van de Ven et al., 2007). Indeed, Sarasvathy (2001, 2008) refers to uncertainty as a defining characteristic of an entrepreneurial problem space where prediction is impossible (Knight, 1921), goals cannot be predetermined (March, 1978), and the environment is not independent of entrepreneurs' ongoing actions (Weick, 1979). This problem space was also the starting point in the development of effectuation (Sarasvathy, 2001).

Effectuation refers to a set of cognitive heuristics that share an internally consistent logic guiding entrepreneurial action under uncertainty (Sarasvathy, 2001). Running on the heels of extensive work in the psychology of choice (Gigerenzer and Gaissmaier, 2011; Kahneman and Klein, 2009; March, 1978; Simon, 1979; Tversky and Kahneman, 1981) suggesting that under uncertainty individuals may trade off speed and frugality (i.e., limiting both time and the amount of information required to take action) against predictive accuracy, effectuation brings to the entrepreneurship domain years of accumulated psychological findings about the behavioral strategies people use when their goals and preferences are uncertain (see also Shepherd et al., 2015). Accordingly, unlike most theories of action, effectual logic negates the idea that control over future outcomes can only be achieved through prediction (Kuechle et al., 2016; Wiltbank et al., 2006). Instead, an effectual approach acknowledges that the information cues on which decisions and actions are based are not only plagued with uncertainty but are also susceptible to direct influence (Sarasvathy, 2001). As a result, what often seems like a continuum of action ranging from relatively passive adaptation to calculative and instrumental planning, opens up another option to achieve control – through the creative transformation of available means (Wiltbank et al., 2006).

Thus far, research has identified manifestations of effectual logic by examining four interrelated heuristics that assemble into a dynamic process of entrepreneurial action (Read et al., 2015; Sarasvathy, 2008). When referring to the entire venture creation process, effectuation begins with entrepreneurs focusing on assessing their immediately available means in terms of who they are (identity), what they know (knowledge and skills), and whom they know (their existing network) (Sarasvathy, 2001). The process then proceeds by envisioning possible ends that can be created with those means. Dismissive of predictive information, effectuation involves decision-makers determining what they are willing to lose in order to follow any particular course of action (Sarasvathy, 2001). This so-called 'affordable-loss' heuristic is therefore a crucial antecedent for effectual action, as it defines an array of potential targets upon which to act (Dew, 2009). In the next step of the process, constant interaction with stakeholders redraws extant goals (converging cycle of goals) and allows to obtain new means (expanding cycle of means) that reignite the entire process once again (Sarasvathy, 2008). Throughout these recurring cycles of goal convergence and mean expansion, the effectual process maintains open-endedness as unexpected events are not seen as something to avoid or hedge against but as opportunities to be leveraged (Harmeling, 2011).

Despite recent critiques about the state and development of research around effectuation as a theory (Arend et al., 2015; Arend et al., 2016; Garud and Gehman, 2016; Gupta et al., 2016; Read et al., 2015; Reuber et al., 2016), the burgeoning literature about effectuation is a testimony to its attractiveness among scholars trying to understand how uncertainty influences a variety of entrepreneurial behaviors and outcomes (e.g., Akemu et al., 2016; Brettel et al., 2012; Chandler et al., 2011; Dew, 2009; Engel et al., 2014; Kalinic et al., 2014; Perry et al., 2011; Wiltbank et al., 2006; York et al., 2016; Engel et al., 2016). However, of particular interest to us are differences in the ways entrepreneurs use networking and how effectuation might inform these behaviors. As evidenced by its central role in the effectual process, social interaction with stakeholders (be they customers, partners, advisors, suppliers, employees, or local communities) is actually an important topic within effectuation writing (Read et al., 2015), and the study of networking behavior has received some explicit attention from effectuation scholars (Sarasvathy and Dew, 2005).

For instance, the means effectual entrepreneurs use as inputs for their ventures include their existing social relationships, accounted for by reflecting on the question: "Whom do I know?" (Chandler et al., 2011; Sarasvathy, 2001). In addition, securing pre-commitments from willing stakeholders is key to the co-creation of goals and opportunities in the effectual process (Burns et al., 2015; Dew et al., 2009; Sarasvathy, 2001; Sarasvathy and Dew, 2005). Indeed, effectuation advances the idea that entrepreneurs often begin to interact with other people by endorsing an attitude of "intelligent altruism"—the recognition that under uncertainty, behaving in ways that increase other people's benefits not only primes the same behavior in return (Blau, 1964; Porter and Woo, 2015) but generally makes it more likely to attract positive long-term payoffs to oneself (Grant, 2013; Haynes et al., 2015; Sarasvathy and Dew, 2008; Shah et al., 2015; Simon, 1993). Despite these advances in the study of effectual networking, we concur with Fischer and Reuber, (2011:4) that "there has as yet been little conceptual consideration of the behavioral interaction element of effectual processes". In the following sections, we therefore take this task more seriously and begin to consider the implications of incorporating the notion of uncertainty into investigations of how entrepreneurs may effectually form and maintain network ties.

4. How do entrepreneurs engage in networking under uncertainty?

Returning to the question that motivated this investigation—how do entrepreneurs engage in networking under uncertainty?—our efforts are now aimed at instigating a new conceptualization of entrepreneurial networking. Yet, before we outline our theory, we turn to contextualize our argument by describing when our theory of entrepreneurial networking is applicable and when it is not (Busse et al., 2016; Shepherd and Suddaby, 2016; Whetten, 1989).

4.1. Boundary conditions and key assumptions

The guiding assumptions of our theoretical model are that, at times, (1) entrepreneurs operate and make decisions under high levels of uncertainty; and (2) that, as a consequence, goals, whether with regard to their venture more generally or to networking in particular, are at best ambiguous at this stage (Alvarez and Barney, 2007; Alvarez et al., 2013; McMullen and Shepherd, 2006; Miller, 2007; Sarasvathy, 2001). Therefore, in line with our conceptualization of uncertainty as detailed above and with the creation view more generally (Alvarez and Barney, 2007), the boundaries of our model are informed by entrepreneurs' subjective perception of uncertainty, which, in turn, is the main "context-delineating variable" of our theory (Busse et al., 2016). Like Milliken (1987: 135) we assert that uncertainty perceptions vary with environmental cues and how they interact with individual attributes (see a detailed categorization by Downey and Slocum, 1975). Whether it is affected by entrepreneurial experience (e.g., Baron and Henry, 2010; Krueger, 2007; McKelvie et al., 2011; Ucbasaran et al., 2010), psychological attributes (e.g., Frese and Gielnik, 2014), fluid emotional states (e.g., Baron, 2008; Cardon et al., 2012; Foo, 2011; Podoynitsyna et al., 2012), or contextual factors like the venture's life-cycle phase (e.g., Hite and Hesterly, 2001; Kazanjian, 1988), environmental dynamism (e.g. Hmieleski et al., 2015), and entry into new markets (e.g., Galkina and Chetty, 2015; Kalinic et al., 2014), as long as ambiguity about what to do next is dominating entrepreneurial decisions, our model holds. As a corollary, we also expect a turning point when these factors change and uncertainty may subside as entrepreneurial goals become clearer and more focused (Alvarez and Barney, 2007, 2010; Alvarez et al., 2013; Hmieleski et al., 2015). When this is the case, existing models of networking become viable again.

This characterization of uncertainty as a cognitive boundary condition (Grégoire et al., 2011) is important since it offers both a more fine-grained line than what can be found in prior research using contextual and life-cycle approaches (e.g., Hite and Hesterly, 2001) as well as a more inclusive perspective than any single individual attribute may offer (e.g., Baron and Markman, 2000; Baron and Tang, 2008; Fang et al., 2015). Still, it is also likely that in reality we could observe a mixture of networking actions across different environments, individuals and decisions. Therefore, while we focus in this paper on contrasting different approaches to networking based on extreme values of this boundary, we acknowledge that perceived uncertainty lies on a continuum that also includes a fuzzier middle ground. Regardless, the boundary conditions and assumptions as stated here limit the accuracy of our theoretical predictions to situations where goal-directed approaches are simply not an option, and, arguably, these situations are extremely ubiquitous in entrepreneurship (Alvarez and Barney, 2007; Alvarez et al., 2013; Knight, 1921; McMullen and Shepherd, 2006; Miller, 2007; Welter et al., 2016).

4.2. Conceptual model

The theoretical assumptions stipulated above define three central challenges to our model of entrepreneurial networking under uncertainty. First, since target ties cannot be identified before action is taken and goals are largely emergent throughout the process, we discuss how these conditions shape networking actions associated with the activation of existing ties and the creation of new ones. However, unlike the limited focus of prior research on resource seeking behaviors, we give room for a host of other motivations and recast

networking as an activity conducive to the generation and transformation of venture ideas. Second, because networking takes place without knowing what the venture may turn out to be, entrepreneurs require some way to select among prospective stakeholders without predicting their expected value. We therefore examine how networking actions may be informed by intelligent altruism and the affordable-loss heuristic and how these might eventually induce stakeholders to self-select into the process by providing pre-commitments. Finally, the same uncertainty that makes goals ambiguous and outcomes unpredictable may also generate unexpected contingencies along the way. We attend to these contingencies by showing how networking activity may semi-endogenize valuable serendipitous events through changes in the composition and content of ties committed to the venture. Each of these challenges is addressed below by outlining the relevant principles of effectuation, specifying their relation to key networking constructs, and delineating the space for effectual networking within the literature. Fig. 1 illustrates this cyclical perpetuation of networking actions leading to the expansion of means and the convergence of goals, which conjointly shape entrepreneurs' perceptions of uncertainty and the development of their ventures. Propositions linking the process components of our model and summarizing the main takeaways from each of the sections below are also presented.

Note that in our model, entrepreneurs may or may not start with a clear venture idea or goal. Instead, networking becomes almost the very first thing they do. Networking often precedes and is always intertwined with every aspect of the entrepreneurial process—from idea generation to resource acquisition, team formation, production and execution—none of which happens in a linear fashion. Rather, they emerge from continual efforts to maintain and create network ties.

4.3. Networking while venturing: Where to begin and what to do next?

When one's own goals are still ambiguous and tasks are largely unstructured and complex, the motivation to contact another person may not be driven by finding a solution to a given problem but merely by defining the problem itself (Nebus, 2006). In fact, social interaction may sometimes be the trigger for communally developing an idea, experimenting with it, or adapting and refining it, all of which are activities that occur before an entrepreneur may even be identified as such. For instance, 'user entrepreneurs' often happen upon an idea by interacting with a community of other users and only retrospectively get to evaluate their networking actions as the genesis for a commercial venture (Shah and Tripsas, 2007). As such, networking actions neither arise in a vacuum nor have to be motivated by a given exogenous goal. Rather, networking ensues from an initial reflection on one's means, as entrepreneurs always begin with their own identities, traits, and tastes; the knowledge corridors they are in; and the social networks they are already a part of (Sarasvathy, 2001). In a sense, networking under uncertainty can be seen to reflect a form of "agency on a leash", where entrepreneurs work with the materials at hand, including prior dispositions, histories, and inertia, and yet they are also able of creating new social paths (Bensaou et al., 2014).

4.3.1. Networking with existing ties

Under uncertainty, instead of holding "too closely to preconceived goals as a way to determine which stakeholders to pursue or which resource-owners to chase" (Dew et al., 2009: 117), entrepreneurs can use their relatively idiosyncratic means and their initial assessments of them to spark the first cycle of networking (Sarasvathy, 2001; Wiltbank et al., 2006). This is also in line with what Baker et al. (2003: 269) have described as network bricolage, that is, "dependence on pre-existing contact networks as the means at hand". Indeed, the crucial question of whom to contact in the face of uncertainty (e.g., Nebus, 2006; Smith et al., 2012) receives a straightforward answer—entrepreneurs begin their interactions with the people they already know (Baker et al., 2003; Sarasvathy, 2001).

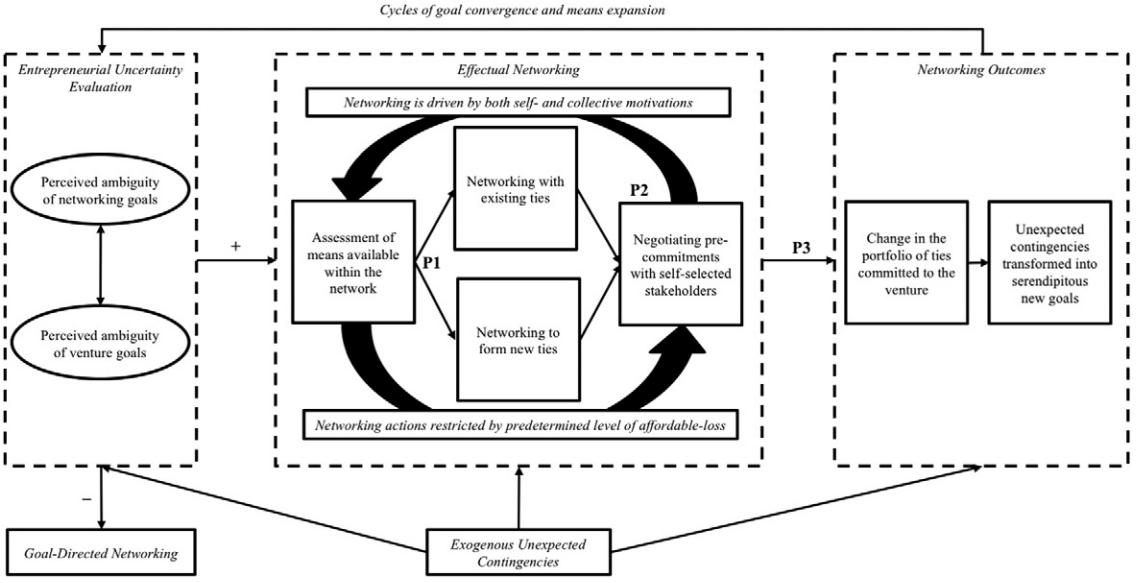

Fig. 1. A dynamic process model of entrepreneurial networking under uncertainty.

This initial focus on existing ties is a recurring theme in studies of entrepreneurs' network evolution (e.g., Baker et al., 2003; Elfring and Hulsink, 2007; Larson and Starr, 1993; Newbert et al., 2013), and the rationale behind it is often tied to mechanisms of homophily and embeddedness, as well as geographic, cultural, or informational propinquity (Hite, 2005; Hite and Hesterly, 2001; Rogan and Sorenson, 2014). While under certain conditions individuals may be able to direct themselves to specific resource providers, in the face of uncertainty, who and where the tie is matter more than any specific resource he or she can potentially provide. For instance, homophily (McPherson et al., 2001) often represents the primary mechanism by which initial ties are selected for interaction, meaning that networking is based on what the entrepreneur and a network tie have in common (Anderson and Jack, 2002; Ruef et al., 2003).

However, there is also evidence that homophily can be managed, as for example, when a set of negotiated identities (e.g., a shared experience, or a shared sense of trauma) provides a template for trusting behavior (Phillips et al., 2013). Similarly, (Daskalaki (2010) also discusses network transformation through the ongoing negotiations of actor and network identities. In these cases, the ability of the entrepreneur to gain the trust of others is absolutely essential (Fang et al., 2015; Tocher et al., 2015). What is important here is that an effectual networking process, while highlighting existing ties as a point of departure (see Fig. 1), is neither entirely path-dependent (cf. Hite and Hesterly, 2001) nor completely calculated or planned (cf. Hallen and Eisenhardt, 2012).

Networking behaviors that can be classified as effectual at this point may include efforts to combine social and business relations with existing contacts (Hite, 2005; Vissa, 2012), thereby deriving relational pluralism[5] from ties that are not just multiplex but also multifaceted (Shipilov et al., 2014a). We therefore acknowledge the simple fact that "individuals interact with others not only because they try to obtain benefits, but also because human interaction is part of being human" (Klyver et al., 2011: 152). Accordingly, networking is likely to include attempts to pace interactions with contacts based on temporal markers rather than on any particular need (Vissa, 2012). The process commencing with these actions is eventually geared toward the transformation of existing ties into a network conducive to the generation and refinement of emerging ideas, i.e., aiming to provide a tentative answer to the question "what can we do together?" At least initially, then, the first core task is to actively interact with existing ties in order to reflect on the availability of means within the network, fashion preliminary venture goals, and identify stakeholders who might want to commit their own means to the process or offer access to referrals.

4.3.2. Forming new ties

In tandem with networking actions aimed at activating potential stakeholders such as family and friends, as well as reflecting on and co-creating initial venturing goals, entrepreneurs are also required to reach out and establish new contacts with strangers or, more broadly, any and all people they might meet in the routines of their lives (Wiltbank et al., 2006). The reason for this is that under uncertainty, there is simply no way to know in advance who will be the conduit for the next necessary resource or who will provide the piece of information that will change the venture's current direction. Indeed, entrepreneurs encounter "tremendous variation in terms of not only what resources are needed, but also when they are needed" (Newbert et al., 2013: 284). It is extremely unlikely for founders to be endowed with a network of contacts catering to all their needs over time, and in fact, only a tiny fraction of privileged entrepreneurs kick-off their ventures with direct strong ties to all relevant stakeholders (Hallen and Eisenhardt, 2012). Thus, in addition to considerations of trust, availability or homophily that dominate early networking efforts, new ties are progressively formed based on the idea that exposure to diverse social resources provides a 'requisite variety' for idea generation, creativity, and growth (Dahlander et al., 2014; De Carolis et al., 2009; Elfring and Hulsink, 2007; Hite and Hesterly, 2001). Accordingly, the next key feature of networking under uncertainty is evident in efforts to cast a wide net and start interacting with potential stakeholders in an ongoing process of negotiating and renegotiating the design of an emergent venture (Keating et al., 2014; Sarasvathy and Dew, 2005; Tocher et al., 2015).

Empirical studies documenting how entrepreneurs form new ties under uncertain conditions often present a similar modus operandi. For example, Elfring and Hulsink (2007) studied IT start-ups in The Netherlands to show that when uncertainty regarding their task and strategy was high, frequent business model changes were inspired by networking that could be described as a "frantic search for people who could provide information on new opportunities and on the feasibility of the business plan" (Elfring and Hulsink, 2007: 1857). Similarly, the Indian high-technology entrepreneurs interviewed by Vissa (2012) described how they seek frequent interaction with strangers and set aside significant amounts of their time to meet new people. Dyer et al. (2008), who researched the behavior of innovative entrepreneurs, went even further in suggesting that 'idea networking', that is, actively creating networks of people with diverse ideas and perspectives, was one of the most important distinguishing characteristics of these individuals. Meeting new people can be done by attending social gatherings, professional and industry events, or using online networking tools such as Linkedin, Twitter, or Facebook (Fischer and Reuber, 2011; Mariotti and Delbridge, 2012; Stam, 2010; Stuart and Sorenson, 2007). As part of Dyer et al.'s (2008) study, entrepreneurs such as Pier Omidyar of Ebay, Ingvar Kamprad of Ikea, and Scott Cook of Intuit all exhibited a consistent behavior in their ceaseless efforts to meet and talk to new people to hear their perspective on different issues.

As these examples illustrate, because an effectual approach acknowledges that uncertainty demands the availability of a diverse network, reaching out to new people is as crucial for moving the process forward as reliance on pre-existing networks is

[5] Shipilov et al. (2014a) define "relational pluralism" as the extent to which a focal entity (a person, a team, or an organization) derives its meaning and its potential for action from relations of multiple kinds with other entities.

for starting it. Overall, the process that begins with self-reflection, assessment of available means within the network, and the transformation of existing ties, moves on to gradually expand the cycle of interactions by reaching out to strangers and fabricating new networks. This is reflected in Fig. 1 and can be summarized in the following proposition:

Proposition 1. *Under uncertainty, entrepreneurial networking is driven by an assessment of available means within the network as carried out through repeated interactions with both existing and new network ties.*

4.4. Attracting pre-commitments from self-selected stakeholders

In addition to providing guidance on networking behaviors per se (e.g., Vissa, 2012) or commenting on structural aspects of network churn brought about by these activities (e.g., Vissa and Bhagavatula, 2012), our conceptualization adds further detail regarding how and why effectual networking is particularly helpful in attracting pre-commitments from willing stakeholders—a key activity when networking under uncertainty (e.g., Burns et al., 2015; Sarasvathy and Dew, 2005).

4.4.1. Pre-commitments

In the face of uncertainty, stakeholder pre-commitments are seen as a form of self-imposed non-negotiable constraint on future choices (Sarasvathy and Dew, 2003). In contrast to predictive approaches, in which a future gain (i.e., the upside) for each of the parties in an exchange may be estimated beforehand, uncertainty positions pre-commitment as a powerful way for actors to prioritize control over their downside loss (Burns et al., 2015; Dew, 2009). Consider how Richard Branson started Virgin Atlantic after receiving a pre-commitment from Boeing, who leased Branson a used airplane for a year with the option of returning it if the airline did not take off (in a financial sense) (Venkataraman et al., 2012). Stakeholders can thus commit resources to the venture regardless of any future expectation and merely in exchange for the chance to directly influence what the venture will eventually become (Wiltbank et al., 2006). As illustrated in Fig. 1, because each stakeholder makes commitments that are aligned with their own level of affordable loss, the process is characterized by self-selection rather than partner selection by a focal entrepreneur (Sarasvathy and Dew, 2005). Put differently, because tie formation takes place in the absence of knowledge about future interactions or the fate of the venture more generally, effectuation substitutes reliance on prediction with a simpler but more robust heuristic—anyone is welcome to self-select into the process by pre-committing to the venture only what they can afford to lose (Sarasvathy and Dew, 2005). Consequently, when networking under uncertainty, whether with existing ties or new ones, the notion of "intelligent altruism" (Sarasvathy and Dew, 2008; Simon, 1993) takes center stage, as it shapes how entrepreneurs invite others to connect and self-select into the process.

4.4.2. Intelligent altruism

Intelligent altruism generally refers to behavior that is neither extremely selfless nor completely opportunistic but recognizes that individuals may have evolved to sense when to emphasize which (Simon, 1993). Interestingly, under uncertainty, altruism and opportunism are often intertwined, as entrepreneurs understand that helping others may also help themselves. Van de Ven et al. (2007: 359) explain this as the "dual drive for self- and collective interests", by which entrepreneurs seek ways to satisfy others' self-interests while presenting others with the possibility to do the same for them (see also Saxton et al., 2016). Indeed, mounting evidence shows that under uncertainty, individuals may even be evolutionarily hard-wired to behave altruistically (Delton et al., 2011; Simon, 1993).

Altruism could be seen as a constituent of an effectual networking process for at least two reasons (Sarasvathy, 2008). First, because effectuation emphasizes direct control in shaping the future, it also draws attention to future behavior by other stakeholders (Sarasvathy, 2008). The fact is that "altruism includes influencing others to behave altruistically" (Simon, 1993: 157). This is supported by social exchange theory (Blau, 1964), which argues that if one is providing benefits to another, this creates an obligation to the receiver to reciprocate (Porter and Woo, 2015). Let us be clear, an expectation of reciprocity does not necessarily mean we are back to instrumentality. As Adler and Kwon (2002) explain, norms of reciprocity involve more than just simple exchanges i.e., 'I'll do this for you, if you do that for me', but also a broader, more generalized, expectation (i.e., 'I'll do this for you, hoping that somewhere down the road, someone will do the same for me'). Thus, when entrepreneurs are unsure about their own goals and preferences, they can simply start by trying to assist others (van Gelderen, 2013), thereby cueing in them an altruistic attitude and eventually improving the chances for reciprocity (Saxton et al., 2016).

Second, most initial contacts with new ties include high uncertainty about whether this is a one-shot or a repeated interaction as well as uncertainty about the expected payoff from any future exchange. This is crucial, as sufficient repeated interactions and high benefit exchanges are classically the most important conditions for the evolution of reciprocity (Axelrod and Hamilton, 1981). However, recent research has demonstrated that given uncertainty about these conditions, humans generally prefer to exhibit altruistic behaviors even in one-shot interactions (Delton et al., 2011). In short, when entrepreneurs and their prospective ties need to decide whether to help each other, the costs associated with mistaking a repeated interaction for a one-shot interaction (i.e., thus being self-interested) are far greater than mistaking a one-shot interaction for a repeated interaction (i.e., behaving altruistically and risking being exploited). This asymmetry promotes altruistic behavior even in the presence of strong cues indicating that this is only a one-shot interaction. As Delton et al. (2011: 13,340) put it: "human generosity, far from being a thin veneer of cultural conditioning atop a Machiavellian core, may turn out to be a bedrock feature of human nature". Intelligent altruism as part of a networking strategy simply reflects these evolutionary realities (e.g.,

Levine and Kurzban, 2006) and urges entrepreneurs to act in a way that would benefit others as well as themselves (Sarasvathy and Dew, 2008; Van de Ven et al., 2007).

Some examples for such behaviors are documented by Vissa (2012), who observed that entrepreneurs try to get new contacts to open up by acting as a sounding board to their problems and questions. Indeed, the provision of problem-solving assistance was recently found to enhance the provider's own performance through learning effects that go above and beyond any reciprocated assistance (Shah et al., 2015). Even without substantive learning, the simple act of finding out what other people need or what motivates them is an integral part of establishing interpersonal knowledge, fostering trust and goodwill with a new tie (Haynes et al., 2015; Larson, 1992; van Gelderen, 2013; Vissa, 2012). In this way, any information gained by helping others can facilitate tie formation between them and a third party such that the focal entrepreneur becomes a bridge between individuals who might benefit from one another (Ebbers, 2014; Obstfeld, 2005). Similarly, Nguyen and Rose (2009) find that in a context of underdeveloped market institutions, entrepreneurs build trust by demonstrating benevolence and helping others in their network with both business and personal problems. Providing a sharper illustration of how entrepreneurs practice intelligent altruism, Grant (2013) discusses the case of Adam Rifkin, a serial entrepreneur who was recently named Fortune's best networker and who is the most connected person on LinkedIn. In explaining his approach to networking, Rifkin says: "My network developed little by little, in fact a little every day through small gestures and acts of kindness… with a desire to make better the lives of the people I'm connected to." (Grant, 2013: 90). He goes on reflecting directly about the issue of uncertainty in networking: "You never know where somebody's going to end up. It's not just about building your reputation; it really is about being there for other people" (Grant, 2013: 92). The key notion is that through providing help, entrepreneurs are able to reach people and build ties that may later transform into potential negotiations over the kind of commitment any of them can actually make for the venture.

This is not to say that all potential ties receive an automatic entry ticket to the venture but rather that the entrepreneur, through practicing altruism, opens the door for them to self-select and make their commitments (Sarasvathy, 2008). As Dew and Sarasvathy (2007: 279) put it: "stakeholders that pass the commitment "test" are given a voice in the (re)design of the innovation; those that do not commit are not". In networking terms, instead of trying to imagine a future opportunity offered by partnering with a certain person, the focus is on actions that would result in a potential partner willing to pre-commit something to the venture in the present (Wiltbank et al., 2006).

In sum, taking actions toward other people, be they existing contacts or newly met strangers (see Fig. 1), in a way that would help them self-select and pre-commit is indispensable to networking under uncertainty (Burns et al., 2015; Sarasvathy and Dew, 2005; Saxton et al., 2016). Thus:

Proposition 2. *Under uncertainty, negotiations over pre-commitments are informed by entrepreneurs' networking actions as driven by both collective and self-interest and as restricted by a predetermined level of affordable loss.*

4.5. Generating contingency to harvest serendipity

Next to other elements of effectual networking, what we proposed above is also an engine of serendipity: "search leading to unintended discovery" (Dew, 2009: 735). Indeed, a central feature of effectuation relevant to a discussion of networking under uncertainty is its treatment of unexpected contingencies (Sarasvathy, 2001). By rendering goals ambiguous and outcomes unpredictable, uncertainty, in and of itself, is a source of unexpected contingencies, an exogenous stream of surprising events that are a "sufficient, yet unnecessary, trigger to entrepreneurial action" (Harmeling and Sarasvathy, 2013: 715). However, in addition to any "blind variations" built into the process (Alvarez and Barney, 2007; Denrell et al., 2015), entrepreneurs, by networking effectually, may intentionally inject randomness and induce "valuable accidents" (Austin et al., 2012; Perry et al., 2011; Sarasvathy and Dew, 2005). Indeed, in his exposition on serendipity in entrepreneurship, Dew (2009: 748) already suggested that "entrepreneurs may be able to engage in social networking behaviors that make it more likely that contingencies (hence serendipities) happen to them, i.e., they may deliberately engage in behaviors that semi-endogenize contingency".

What we propose here is that these networking behaviors, alluded to by Dew (2009), are in fact the very same behaviors we outlined in the previous sections as characteristic of an effectual networking approach. In other words, entrepreneurs can increase both the amount of and the potential value captured from unforeseen events through growth in the portfolio of ties committed to their venture. They do so by (1) reflecting on their available means using social interactions with existing network ties; (2) progressively and proactively expanding their tie formation activities to include any and all stakeholders; (3) practicing intelligent altruism in the formation of partnerships; and (4) allowing for the co-creation of venture ideas through pre-commitments made by self-selected stakeholders.

Thus, in contrast to goal-directed networking strategies that seek to avoid deviation from a plan by engaging in targeted and efficient tie formation (cf. Hallen and Eisenhardt, 2012), effectual networking highlights contingencies as a valuable "side-effect" and, indeed, as a resource to be leveraged (Harmeling, 2011; Sarasvathy, 2001). Table 3 presents a list of distinguishing characteristics between these two approaches to entrepreneurial networking.

4.5.1. Generating contingencies

The most obvious engine of contingency brought by networking is the extent to which entrepreneurs seek out and add new interpersonal ties as part of their effort to reflect on their means, test ideas, and interact with others who are diverse in both

Table 3
Contrasting goal-directed and effectual networking.

Issue	Goal-directed networking	Effectual networking
Venture objectives are	Given and fixed, preferences are clearly ordered (i.e., venture goals determine networking goals)	Emergent, flexible, and unordered (i.e., networking determines venture goals through co-creation)
Networking objectives are	Available to some extent but largely unpredictable (i.e., risk)	Not available and in some cases not knowable (i.e., uncertainty)
Networking is motivated by	Rational self-interest with predominantly instrumental motives (e.g., "what can I get from you?")	Both self- and collective interests with predominantly developmental motives (e.g., "what can we do together?")
Networking begins with	Both new and existing ties, whether they are weak or strong (as part of resource seeking activities to satisfy projected future needs)	Existing and predominantly strong ties (as part of initial assessment of currently available means within the network)
Networking search scope is	Narrow, directed at specific predetermined targets (i.e., focused on meeting the "right" people and reaching them efficiently)	Broad, directed at generating unexpected contingencies (i.e., focused on meeting new people or discovering new facets in existing ties)
Tie interaction is	Primarily calculative and transactional (i.e., "how should I protect myself from opportunistic behavior of others?")	Primarily based on intelligent altruism and relational embedding (i.e., "if I commit to help others, they are more likely to reciprocate")
Tie selection is	Based on given objectives (ties are selected for their future expected value)	Based on self-selection (ties self-select based on what they can afford to commit in advance)
Eventual network change leads to	Securing needed resources and progressing toward given venture goals	Serendipitous outcomes involving resources, ideas, or both, which result in new or modified venture goals

background and perspective. This is certainly not new, as the literature about social networks, like most other theories of search behavior (Laursen and Salter, 2006; Leiponen and Helfat, 2010; Maggitti et al., 2013; March, 1991), has long recognized that the range and breadth of search activities are strongly associated with unexpected discovery (Burt, 2004; Granovetter, 1973; Kim and Aldrich, 2005). Being involved in activities that expose them to dissimilar others allows entrepreneurs to create ties crossing social boundaries and to gain numerous opportunities to experience heterogeneous points of view, which, in turn, improves the probability of unexpected occurrences (Aldrich and Kim, 2007; Dyer et al., 2008). Hence, just as advocated by other conceptions of entrepreneurial networking (e.g., Vissa's 'network broadening' actions), these behaviors promote the occurrence of contingencies simply as a function of interaction with diverse interpersonal ties.

However, in opposition to so-called "efficient" networking strategies that "avoid lengthy and high-effort searches, failed attempts, and undesirable partners" (Hallen and Eisenhardt, 2012: 35), an effectual approach acknowledges that due to uncertainty, what often seems like a dead-end search today may become tomorrow's opportunity (Sarasvathy, 2001). Consider a hypothetical meeting between an entrepreneur and a potential tie at a social event, during which the viability of a certain business idea is discussed. At this moment, any (ex-ante) judgment about the future (ex-post) "desirability" of this tie would be based on missing information. As Nebus (2006: 626) puts it: "Asking a naive information seeker to be able to accurately assess the potential quality of an information source is like asking someone who has ice skated once or twice to judge an ice skating competition". Social interaction is thus seen as a vehicle for deliberately creating more and more contingencies, even if non-valuable or costly contingencies are eventually much more numerous than valuable ones (Austin et al., 2012). Under uncertainty, every seemingly "normal" interaction between the entrepreneur and potential stakeholders may produce a cascading wave of extreme outcomes (Crawford et al., 2014). Indeed, the power of such encounters may be so remarkable (Tasselli et al., 2015) that sometimes "people receive crucial information from individuals whose very existence they have forgotten" (Granovetter, 1973: 1372). This realization that any future payoff from networking is governed by extreme events and power laws (Aldrich and Kim, 2007) marks an important departure from other networking approaches that try to avoid "undesirable partners" and prematurely label "lengthy and high effort" search activities as "failed attempts".

4.5.2. Harvesting serendipity

Additionally, as noted by Harmeling and Sarasvathy (2013), it is neither the mere occurrence nor the nature of a contingency itself or even its intentional fabrication that is of utmost importance but rather what entrepreneurs do with it. The heart of the matter becomes how entrepreneurs leverage unexpected contingencies arising from both networking activities and exogenous sources. Thus, next to deliberate efforts to generate contingencies, effectual networking is distinguished from other approaches insomuch as it represents an open-ended and flexible process apt at leveraging unexpected surprises (Sarasvathy, 2008). Networking under uncertainty is an activity that demands flexibility with regard to goals, as networking actions are merely intended to bring on-board stakeholders who will co-create and redesign any initial venture idea. For example, Reddit, a startup that recently grew to over 175 million regular monthly users, was the result of the founders' networking efforts with investors, but it materialized only after their first investor asked them to come up with a completely different idea from the one they originally pitched him (Ohanian, 2014). This is in line with Keating et al. (2014), who found that a primary driving force of venture development is the entrepreneur's ability to remain open to goal-shifts arising from their networking activities. By embracing rather than eschewing discomfiting information, unfruitful tie formation may be redrawn as an opportunity (Chandler et al., 2011). Moreover, the application of the affordable loss heuristic works to keep the potential cost of networking at an acceptable level while keeping the venture open to unexpected new possibilities on the upside (Dew, 2009). Thus, Fischer and Reuber (2011)

show that entrepreneurs use "perceived time affordability" to bound whatever time they can afford to lose on attempts to form ties through social media channels.

Because serendipity is characterized by "some combination of search (directed effort), contingency (favorable accidents) and prior knowledge (sagacity)" (Dew, 2009: 736), attracting stakeholders' pre-commitments and enlarging the means available to the venture serves to enhance the pool of knowledge required to detect and act on key contingencies. Thus, while the number of contingencies increases as new stakeholders get a voice in the design of the venture, the chance of leveraging these contingencies increases too, as every pre-commitment makes the venture more capable at "connecting the dots" and acting on relevant surprises. This dual function embedded in effectual networking assists in treating unexpected contingencies as opportunities to control newly emerging situations, and it may therefore produce valuable serendipity. Fig. 1 illustrates this point by showing the relationship between effectual networking and relevant outcomes. This is also reflected in:

Proposition 3. *Under uncertainty, effectual networking changes the portfolio of ties who commit to co-create the venture, thereby generating unexpected contingencies and enabling the serendipitous emergence of new entrepreneurial goals.*

5. Discussion

We have put forward a rudimentary conceptualization of a dynamic networking process that provides but a starter set of possible issues to be addressed by studying entrepreneurial networking under uncertainty. Below, after detailing our main contributions to the literature, we turn to outline additional possibilities that can feed into a broader research agenda and hopefully change current conversations about networking altogether.

5.1. Contributions

Primarily, our study contributes both to network theory and entrepreneurship theory with a new conceptualization of entrepreneurial networking that does not only stipulates when or how networking will lead to entrepreneurial action (e.g., Autio et al., 2013), but rather that networking *is* entrepreneurial action. We therefore propose to see uncertainty as the defining element transforming networking agency into entrepreneurial agency (McMullen and Shepherd, 2006) and thereby aim to reinvigorate interest in the socially embedded nature of agency within the flow of time (Emirbayer and Mische, 1998). Put simply, by taking uncertainty into account, we illuminate an overlooked but extremely relevant part of how and why entrepreneurs engage in networking (Porter and Woo, 2015). In an influential piece charting a research agenda on the link between entrepreneurship and network research, Stuart and Sorenson (2007) listed the origins of networks as a central issue to be addressed by developing an empirical and theoretical understanding of how entrepreneurs construct their networks. Unlike existing contributions to this emerging stream of research (e.g., Hallen and Eisenhardt, 2012; Vissa, 2011), which adopted discovery-view assumptions and highlighted a strong form of rational agency (Miller, 2007), we open a completely new angle on entrepreneurial networking by assuming that agency is constrained by uncertainty (Alvarez and Barney, 2007; Gulati and Srivastava, 2014; Sarasvathy, 2008). We therefore both challenge and complement the prevailing view on networking agency and believe that by doing so, entrepreneurial network research can be greatly enriched.

By introducing the highly relevant concept of entrepreneurial uncertainty both as boundary to our specific theory as well as a bridge to general theories of entrepreneurial action we position both the creation view (Alvarez and Barney, 2007) and effectuation (Sarasvathy, 2001) as theoretically insightful to the study of entrepreneurial network construction. Because attention to uncertainty continues to be a driving force of novel research across the entrepreneurship field as well as management studies more broadly (Alvarez and Barney, 2005; Alvarez et al., 2013; Foss and Weber, 2015; McKelvie et al., 2011; McMullen and Shepherd, 2006; Milliken, 1987; Sarasvathy, 2001; Weber and Mayer, 2014; Wiltbank et al., 2006), we are confident that it can also add much value to investigations of how entrepreneurs shape their social networks. Indeed, Klyver et al. (2011:157) already noted that the key to a much-needed balance in research about networking is in starting with more "empirically realistic assumptions". To that end, the underlying assumptions of our theory not only correspond to the empirical reality of entrepreneurship (McMullen and Shepherd, 2006) but also tie in with recent developments in the study of networking as constrained agency (e.g., Bensaou et al., 2014), as we help specify "both how actors exert agency in the face of constraint and how their actions create new constraints" (Gulati and Srivastava, 2014: 77). This contribution is important because extreme positions in the debate about the roles of structure and agency tend to discourage new theoretical understandings of the networking phenomenon (Bensaou et al., 2014; Emirbayer and Goodwin, 1994; Emirbayer and Mische, 1998; Gulati and Srivastava, 2014; Vissa, 2012). Instead, the position we take here may encourage more research on the dynamic and reciprocal influence between individual actions and social networks (Tasselli et al., 2015).

The theory we have proposed also links to and extends research about the integration of psychological and network perspectives in entrepreneurship studies (Burns et al., 2015; Casciaro et al., 2015; De Carolis and Saparito, 2006; Menon and Smith, 2014; Nebus, 2006; Smith et al., 2012; Tasselli et al., 2015). First, while it is "inextricable from the beliefs that produce action" (McMullen and Shepherd, 2006: 135), uncertainty is ultimately a cognitive construct (Chandler et al., 2011; Milliken, 1987). We thus invigorate research on entrepreneurial cognition (Grégoire et al., 2011; McKelvie et al., 2011; McMullen and Shepherd, 2006; Shepherd et al., 2015) to look beyond existing studies about the role of uncertainty in networking. For example, Nebus (2006) proposes a heuristic theory of network generation that predicts that information-poor situations (i.e., high uncertainty) would call for contact with new partners before their prospective value could be evaluated. Similarly, Burns et al. (2015) theorize about how the process of enrolling stakeholders in entrepreneurial endeavors varies depending on whether

the setting is perceived as risky or uncertain and Saxton et al. (2016) make similar distinction to explain helpful community engagement with a venture of (i.e., venture advocate behaviors). Our conceptualization extends such work by adding and elaborating on several novel characteristics of networking behavior under uncertainty (e.g., altruism, pre-commitments, co-creation, and serendipity). Second, we give much-needed attention to motivation as a key variable informing networking actions. Motivation is rarely addressed explicitly in network studies, but as the field moves toward acknowledging the power of individual actors, it is likely that interactions between motivation and network variables would play a central role (Casciaro et al., 2015). For example, an account of entrepreneurs' motivations can enhance our understanding of networking actions by illuminating sources of variability that have so far remained hidden. Our exploration of motivational assumptions, from self-interest to altruism and pro-social motivations (Folger and Salvador, 2008; Grant, 2013; Shepherd et al., 2015; Van de Ven et al., 2007), showcases a repertoire of reasons driving entrepreneurs to obtain commitments from stakeholders (Burns et al., 2015). Indeed, Bensaou et al. (2014: 53) already demonstrated that "networking acts contain powerful moral understandings and personal commitments". Thus, we see our model as valuable to entrepreneurship research more broadly in that we propose a dynamic and interactive view of entrepreneurial action that highlights "motivations beyond solely those of financial goals" (Shepherd, 2015: 1).

In addition, we contribute to research on effectuation and, more specifically, on the link between effectual thinking and networking at the interpersonal level. By clarifying the assumptions required for entrepreneurs to show different networking behaviors, we speak to empirical studies of effectuation for which difficulties in interpreting results pertaining to networking often clouded conclusions about this important aspect of the effectual process (e.g., Chandler et al., 2011). For example, we point to the need to measure not only effectual networking behaviors but also the underlying motives that define them as such. We therefore address previous calls for developing stronger links between the literature on effectuation and other relevant constructs. For instance, building on Edmondson and McManus' (2007) suggestions for a fit between research methods and the state of theoretical development of a field, Perry et al. (2011) reviewed the effectuation literature, calling for scholars to start tackling research questions that explore relationships between effectuation and established constructs, thereby moving the field from a nascent to an intermediate stage. Along the same lines, Arend et al.'s (2015, 2016) vigorous critique of the state of effectuation research makes several pleas to build bridges between effectuation and existing constructs to provide new insights. Our work here represents an important step in that direction and constitutes a unique contribution that goes beyond the simple affirmation of effectuation as relevant to research on networking behavior (cf. Fischer and Reuber, 2011). In parallel, we see much room for effectuation research to be extended with a better account of networking and relationship building. In that regard, another important attribute of our model is the close correspondence it assumes between networking actions and the process of venture creation more generally (Hite and Hesterly, 2001; Klyver et al., 2011; Slotte-Kock and Coviello, 2010). Beyond what we already suggested above, an immediate implication of considering effectual networking may, therefore, link to ongoing conversations about the relationship between effectuation, trust, altruism, and opportunism (Goel and Karri, 2006; Karri and Goel, 2008; Sarasvathy and Dew, 2008) and the crucial role of social interaction in the effectual process (Dew and Sarasvathy, 2007; Fischer and Reuber, 2011; Read et al., 2015; Sarasvathy and Dew, 2005).

5.2. Directions for future research

A key component of networking under uncertainty that we believe is particularly worthy of future research is the issue of networking for serendipity (Dew, 2009). Literature on social networks also discusses serendipitous networks as opposed to goal-directed networks (Kilduff and Tsai, 2003), yet for these scholars, serendipity is merely an exogenous structural feature of randomness and spontaneous encounters (Casciaro et al., 2014; Feld, 1981, 1982; Shipilov et al., 2014b). We complement this view while concurring with Porter and Woo (2015: 20), who suggest that "it may be useful to identify and empirically validate networking practices that cultivate opportunities to encounter (potentially) valuable contacts". Stam's (2010) examination of entrepreneurs' participation in networking events provides an obvious example of such a practice. In the sections above, we elaborated on a number of additional examples. In a larger perspective though, our reinterpretation of serendipity as partially endogenous to entrepreneurial actions entails abundant opportunities for introducing effectual networking to studies that examine the structural determinants of serendipitous and goal-directed networks. This focus is consistent with other scholars who emphasize the role of human agency in the proactive management of fortuity (Austin et al., 2012; Bandura, 2006; Dew, 2009). The fundamental question for this line of work is the extent to which some parts of network serendipity can be attributed to the use of particular networking strategies. Scholars interested in this question could adopt a multi-level research perspective that connects the node level with the structural level (e.g., Ibarra et al., 2005). Vissa and Bhagavatula's (2012) longitudinal study of network churn, in which both networking actions and structure are accounted for, is illustrative of such research designs. Moreover, to capitalize on contingent events and extract value from serendipity, authors have proposed sagacity, or a "prepared mind", as a necessary condition (Dew, 2009). Therefore, future research could also address the extent to which and why some entrepreneurs are more open to recognizing and leveraging unexpected contingencies (Harmeling, 2011; Harmeling and Sarasvathy, 2013).

Going further, future studies building on our model may feed into a larger research agenda to better understand how the entrepreneurial context changes the way individuals interact with one another. This is in line with Venkataraman et al.'s (2012) plea for a new nexus of entrepreneurship around actions and interactions and their call for empirical research that takes interactions between entrepreneurs and their stakeholders as the unit of analysis. Currently, there are only a handful of studies dealing with the process of inter-subjective interactions in entrepreneurial negotiations (e.g., Artinger et al., 2015; Hellmann and Wasserman, 2011), yet opportunities to develop this line of research are plentiful. An especially promising direction for such research would be to expand the conceptualization of uncertainty to include interpretive uncertainty, the uncertainty that arises when parties in

an exchange hold conflicting cognitive frames (Weber and Mayer, 2014). In addition, scholars may analyze entrepreneurial interactions with different kinds of stakeholders, thereby exploring whether contact with customers, investors or other entrepreneurs generates different levels of interpretive uncertainty and thus requires different networking techniques. An intriguing possibility for such a line of research is in historical case studies that could document a chain of stakeholder interactions over time (e.g., Chesbrough et al., 2014). Additionally, a process method like the experience sampling methodology (Uy et al., 2010) could capture intra-individual differences in the use of networking actions.

6. Conclusion

Overall, our paper underscores the importance of uncertainty for advancing theoretical development and a deeper understanding of networking behavior as a genuinely entrepreneurial act. There is little doubt that entrepreneurs can and do shape their network structures by using networking actions and strategies. This, however, does not necessarily mean that agency in networking is reserved only for heroic network architects who can search, plan, and pursue contact with predictably valuable ties. Over 30 years ago, Granovetter (1985: 487) already warned us to avoid theoretical extremes and noted that "actors do not behave or decide as atoms outside a social context, nor do they adhere slavishly to a script written for them by the particular intersection of social categories that they happen to occupy". Instead of portraying entrepreneurs as either completely passive actors or downright calculative networkers, we suggest paying more attention to the notion of uncertainty and how it acts to both constrain and enable alternative forms of networking agency–the lifeblood of entrepreneurial creation.

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