

Mindfulness, Creativity, and Novelty Production of Entrepreneurs

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Abstract

Entrepreneurs are the creative artists of business—noticing business opportunities that have been overlooked, envisioning new products/services and business ventures that do not yet exist, and bringing these into existence by creatively combining and structuring the raw materials and resources that are available. Mindfulness and creativity are therefore essential to the alertness and innovativeness of entrepreneurs. This study is an exploration of the relationship between mindfulness and creativity, in the context of entrepreneurship. Interpretive structure modelling of the expert opinions of entrepreneurs and mindfulness practitioners is used to develop a model in which creativity is associated with specific elements of Langer's (1992) theory of mindfulness. According to this theory, mindfulness comprises novelty seeking, sensitivity to context, awareness of multiple perspectives, and novelty production. Structure modelling suggests that creativity plays a mediating role among these constructs. This model is then contrasted with an alternative model in which creativity is identified with novelty production. Structural equation modelling with empirical data from entrepreneurial undergraduate students is used to compare the degree of fit of these competing models. This provides an improved understanding of how creativity and mindfulness work together to support innovation by entrepreneurs.

Keywords: *Creativity, mindfulness, entrepreneurship, structural modelling*

INTRODUCTION

Mindfulness has been highly incorporated in people's personal and career lives in recent years. Scholars in business and organizational management fields have recently investigated the impact of mindful behaviour on many different aspects of business, including management (Nandram and Borden 2011), leadership (Boyatzis and McKee 2005, Nandram and Borden 2011, Reb, Narayanan et al. 2014), performance success (Sauer and Kohls

2011), business ethics (Lampe and Engleman-Lampe 2012), organizational development (Erickson and Dyer 2005, Jordan, Messner et al. 2009, Sutcliffe, Vogus et al. 2016), market analysis (Gordon and Schaller 2014), global markets (Bayraktar and Oly Ndubisi 2014) and organizational change (Wilensky 2016). The performance of business has a great effect on social and economic development of the societies. But it is creativity and innovation that are the fundamental drivers of these benefits. As the founders/creators of these businesses, entre-

preneurs are the ones who see and think differently than others, and who thereby initiate the creation of ventures and markets that do not yet exist. This different thinking is a unique cognitive ability of some individuals, suggesting that we should consider theories from psychological/cognitive studies to address this prominent feature of entrepreneurs and social development. In this spirit the current study adopts mindfulness theory, with its focus on the inner aspects of mind, emotion and cognition, as a useful and appropriate foundation to explore creativity and innovation in entrepreneurs.

LITERATURE

Entrepreneurs are the creators and innovators of the business world. Their new ventures are responsible for the creation of new products and services, new markets, and new jobs and tax bases—by improvising to discover novel business approaches to meeting societal needs (Fisher 2012). Sometimes this is done through “bricolage”, the unstructured experimentation and play with combinations of whatever resources are at hand (Baker, Miner et al. 2003). And sometimes it is done through “effectuation”, the use of resources at hand to explore potential goals in the face of high market uncertainties (Sarasvathy 2001). But either way, this proclivity for improvisation has been found to be a major predictor of entrepreneurial intentions at the individual level (Hmieleski and Corbett 2006). Improvisation and the ability to thereby reconceptualise existing resource endowments are also strongly associated with entrepreneurial execution (Baker and Nelson 2005). Individuals with creative or innovative abilities are able to see opportunities better, and to invent new ways of using existing resources to launch new business that exploit these opportunities. Entrepreneurs therefore represent the creative aspects of business activities in several different ways: the creation of new market opportunities, the invention of new business models to address these opportunities, and the innovative use of underutilized resources to support these new business models.

Increasingly, entrepreneurship scholars have been exploring the importance of individual characteristics and traits on the ability of entrepreneurs

to be creative and innovative in spotting new business opportunities and in developing novel business models to exploit these (e.g., Schwenk 1984, Baron 1998, Krueger 2000, Mitchell, Busenitz et al. 2007). In particular, increasing research efforts have begun to explore the role of the cognitive psychology of the entrepreneur, such as the manifestation and management of attention (Sullivan 2010, Ocasio 2011, Valliere and Gegenhuber 2013). Academic study of creativity has a significant root in the concept of “divergent thinking” (Guilford 1950) that has sensitivity to problems. Some of the dimensions of creativity that have been used in measurement and assessment of creative capacity include fluency, originality, elaboration, flexibility, abstraction, and resistance to closure (Torrance 1998). Fluency refers to the ability to quickly and easily generate many ideas. Originality refers to the extent to which these ideas are different from the ideas most commonly generated from a given stimulus, and thereby the ability to generate uncommon or unique responses. Elaboration refers to the extent to which the ideas have been developed with many details or nuances. Flexibility refers to the ability to use the same starting materials in a variety of different ways or different roles. Abstraction refers to the idea that creativity involves a conceptual distancing from concrete thoughts. And resistance to closure refers to the ability to keep an open mind by resisting the temptation to quickly drive to a solution by closing down options and possibilities.

This cognitive research is also beginning to suggest that an important dimension of entrepreneurial alertness is the ability to be mindful of the present environment—to be able to see what is present but being overlooked by others, and to be able to guide the attention of others (Weick and Sutcliffe 2006, Valliere 2015). This further suggests that somehow the formal construct of mindfulness has a role to play in entrepreneurial creativity and innovation.

The Eastern view of mindfulness is embedded in Buddhist philosophy. In Theravada Buddhism mindfulness is associated with two different meanings: to remember, and to develop lucid awareness. According to the first meaning, mindfulness is associated with memory, as mindfulness enhances one’s ability to remember past experiences. In the

second meaning, mindfulness is associated with what is actually happening in the present moment, without preconception or delusion (Khoury, Knäuper et al. 2017). Within Buddhist thought, a key reason for developing increased mindfulness is long-term spiritual attainment and reduction of suffering that comes from attachment, rather than just symptomatic relief of stress.

The Western view of mindfulness has a more secular orientation towards the present moment, perceived without conceptual filters or interpretations. Ellen Langer is one of the leading theorists for the Western view of mindfulness. According to Langer (1992), mindfulness comprises openness to novelty, alertness to distinctions, sensitivity to different contexts, implicit awareness of multiple perspectives, and orientation in the present. In this study, Langer's theory of mindfulness has been applied because it conceptualizes mindfulness on the basis of information processing and creativity theory (Haigh, Moore et al. 2011). In contrast to Buddhist ideas about mindfulness, Langer's approach focuses on active discrimination and refinement of existing distinction—creation of new distinct categories out of the continuous stream of events that flow through activities and a more nuanced appreciation of context and of alternative ways to deal with (Langer 1989). Although scholars have used different terminologies to reflect different aspects of Langer's theory, they all have roots in cognitive psychology and creativity theory. Citing Langer and Moldoveanu (Langer and Moldoveanu 2000: 2), Weick and Putnam explain that “when people draw novel distinctions in the face of disruptions, several things happen. “There is (1) a greater sensitivity to one's environment, (2) more openness to new information, (3) the creation of new categories for structuring perception, and (4) enhanced awareness of multiple perspectives in problem solving” (Weick and Putnam 2006: 95).

While the literature above suggests that mindfulness may be implicated in creativity and entrepreneurial innovation, this area appears to be significantly under-theorized. Accordingly, the goal of this study is exploratory, to propose some potential relationships between mindfulness and creativity, and to use empirical data to assess which is likely to represent a promising line of future theory devel-

opment. In the following sections we develop two competing models for the relationship between mindfulness and creativity. We then use empirical data to compare the degree of support for the two models, and thereby suggest lines of future theorizing.

METHODS

In the first stage of this study, two models were developed using different approaches. These models represent the relationships among creativity and four key elements of Langer's Mindfulness/Mindlessness Scale (Haigh, Moore et al. 2011)—novelty seeking, sensitivity to context, awareness of multiple perspectives, and novelty production. Because creativity is a future-oriented activity that potentially blurs pre-existing categorizations, we omitted the present orientation and alertness to distinction elements of Langer's scale. The first model was developed from expert opinion using interpretive structure modelling. The second model was developed by comparing the definitions of creativity and novelty production and then modifying the first model to reflect the apparent correspondence between them.

Interpretive Structure Modelling

Interpretive structure modelling (ISM) is a methodology for discovering relationships of causal precedence among constructs, implicit in the tacit knowledge of domain experts (Warfield 1994). This methodology has been successfully used in a wide range of recent business research, such as developing models of cleantech (Vinodh, Ramesh et al. 2016) and safety management (Khan, Ghazali et al. 2017). ISM is especially suited to exploring and theorizing relationships within complex issues or situations. In it, experts are asked to consider various theoretical constructs in a pairwise manner. For each pair (e.g., constructs A and B), the experts rank which order of precedence or influence exists between them: A may necessarily precede B, B may precede A, A and B may have mutual interactions, or A and B may be completely independent and have no relationship of precedence between them. From an expert consensus of these precedence relationships a causal model may be developed.

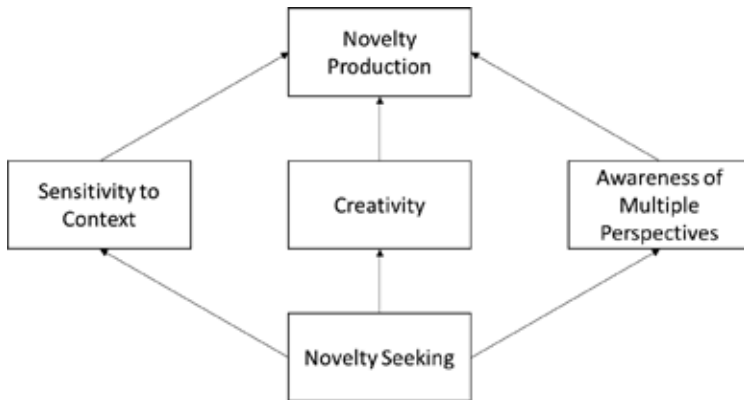


Figure 1: Expert Model

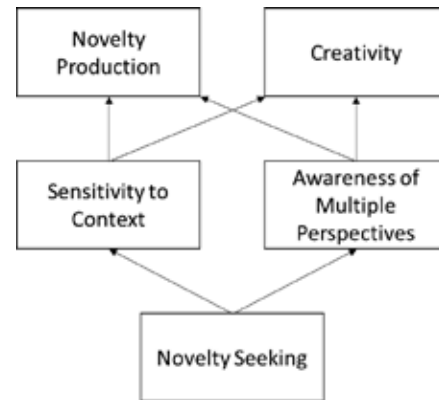


Figure 2: Alternative Model (Creativity on par with Novelty Production)

For this study, the five constructs presented to the experts were creativity (“the ability to easily generate many original or elaborate new ideas”), novelty seeking (“a person’s active engagement in novel things or ideas”), novelty production (“a tendency to actively create new categories, perceptions, things or ideas”), sensitivity to context (“the ability to modify behaviour to reflect the specific context of the situation”), and awareness of multiple perspectives (“the ability to see a situation from the different perspectives of other people”). Seven experts participated in the ranking exercise. These individuals were selected based on their familiarity and expertise in mindfulness or creativity (or both), either as practitioners or as academic researchers. For example, one participating expert is an academic researcher of innovation and entrepreneurship and also a teacher of secular mindfulness practices.

Each expert first recorded their individual views on precedence relationships between each pair of constructs (e.g., whether novelty seeking *precedes* novelty production, *follow* it, has *mutual interaction* with it, or has *no precedence relationship* with it). A one-round Delphi technique was then employed to develop a group consensus ranking. The seven expert rankings were aggregated and reported to the individual experts, who were invited to consider revising their rankings in light of this information about the group’s aggregate opinions. These revised individual rankings were again aggregated, and the majority views taken as being the consensus view

of the group.

The ISM methodology uses the resulting precedence information to develop a structural self-interaction matrix, and from it a reachability matrix that captures the transitive precedence relationships among all of the constructs being modelled. For example, from the expert data it was observed that no constructs are precedent to novelty seeking (it is therefore exogenous to the model), and that novelty production is precedent to no other constructs. Figure 1 shows the resulting model relationships in diagrammatic form. Of note in this model, creativity is viewed as being an intermediary construct between novelty seeking and novelty production.

The second model was derived from the first model by recognizing the degree of conceptual similarity between the creativity and Langer’s novelty production. Langer describes the novelty production aspect of mindfulness as a flexible state of mind in which new information and new contexts are actively engaged (Langer 1992). This appears to have significant conceptual overlap with creativity, which E. Paul Torrance, the father of modern creativity research, defined as “a process of becoming sensitive to problems... searching for solutions... testing and retesting these... and finally communicating the results” (Torrance 1966: 6). For this reason, the second model considers the possibility that novelty production and creativity are either synonymous, or at least should take equivalent positions in the nomological network. Accordingly, the second

model places creativity on par with novelty production, with the same conceptual antecedents (sensitivity to context and awareness of multiple perspectives), as shown diagrammatically in figure 2.

Empirical Testing

In the second stage of this study, the competing models were operationalized, and compared using structural equation modelling to assess the goodness of fit of each model with the empirical data. The mindfulness constructs of these models were operationalized using the previously validated scales of Langer (Haigh, Moore et al. 2011), comprising 34 Likert questions. Novelty seeking was measured with a five-item scale, sensitivity to context was measured with a ten-item scale, awareness of multiple perspectives was measured with a two-item scale, and novelty production was measured with a five-item scale.

Creativity was operationalized using the Abbreviated Torrance Test for Adults (ATTA) (Goff and Torrance 2002). This is a well-established psychometric instrument for assessing individual creativity, both in verbal and figural contexts, involving standardized creative activities (such as completing a partial figural drawing). The ATTA results were each scored on over 150 dimensions by two independent researchers with an interrater reliability of 91%. Scores on the ATTA are reported as a single-item "Creativity Index".

Structural equation modelling (SEM) was selected as the appropriate method of determining the degree to which the data support the competing models. The models both represent a system of simultaneous and interconnected regressions of dependent variables onto immediate antecedents. SEM software attempts to solve these systems of equations simultaneously using maximum likelihood estimation. It is statistically superior to individual regression models and exploratory factor analyses because it incorporates both manifest and latent variables and explicitly estimates measurement error and unexplained variance within the models.

FINDINGS

These measures were administered by paper survey

to a sample of undergraduate business students. Of 53 administered surveys, 50 valid and complete responses were obtained, representing a 94% response rate. The surveys were administered during normal class sessions, giving no reason to suspect non-responses would bias the results (e.g., students who were too busy to complete). The data was recorded in an Excel file. Of 1700 total Likert responses, there were 3 missing elements (0.17%). Replacement values for these were imputed from the mean values of all responses to the relevant questions. This data was then imported into Amos software for structural equation modelling.

ANALYSIS

A measurement model was created in which each latent mindfulness construct is indicated by the manifest items of the Langer scales, and the creativity construct is measured by the "creativity index" from the ATTA instrument. This model was then assessed both for convergent validity and discriminant validity, prior to being used as a basis for a structural model. Convergent validity of the models was assessed on the basis of a CFI goodness-of-fit measure (Hair, Anderson et al. 1998). Using the reported data, the proposed measurement model shows CFI improving to 0.621 from < 0.001 of the baseline regression model. From this, the convergent validity of the model is strongly inferred.

Turning to the issue of discriminant validity, the measurement model was assessed using the overall chi-squared statistic, by successively constraining the covariances among the latent variables to unity and observing any resulting increases in chi-squared for one degree of freedom (Hair, Anderson et al. 1998). An increase of greater than 3.84 would indicate a statistically significant reduction in model fit ($p = 0.05$), and would indicate that those two latent variables represent distinct constructs without significant cross-loading. This test was applied to each pair of latent variables in turn. In the unconstrained state, chi-squared was 532.2 for the proposed measurement model. When the covariance between Novelty Production and Awareness of Multiple Perspectives was (for example) constrained to unity, chi-squared increased to 545.6. This test was repeated for each of the remaining

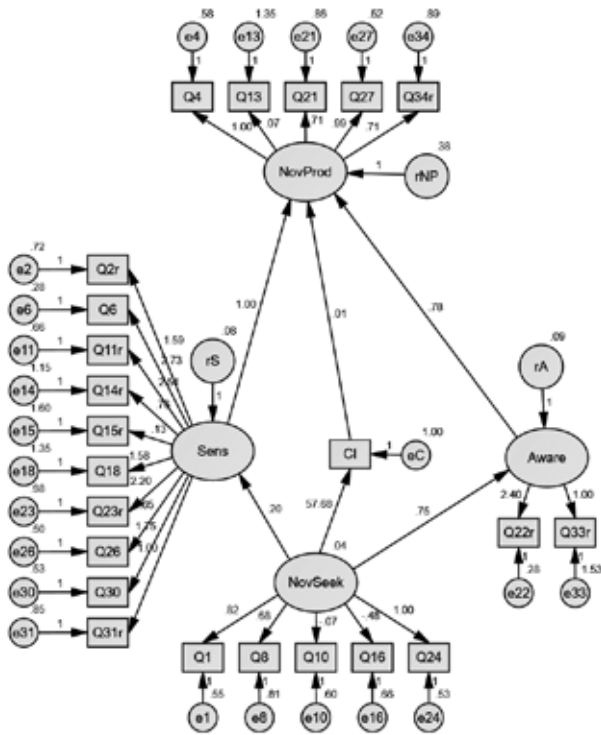


Figure 3: Path Weight Estimates of Expert Model

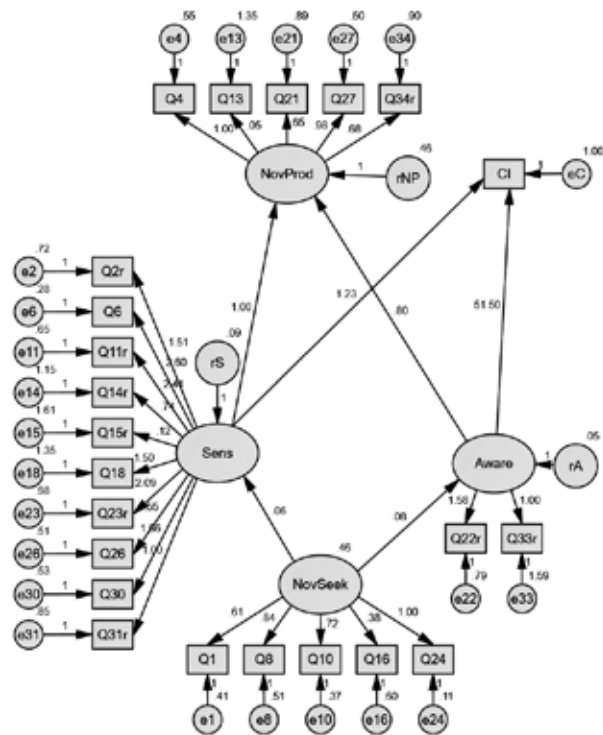


Figure 4: Path Weight Estimates of the Alternative Model

pairs of latent constructs. In each case chi-squared increased by more than 3.84, supporting the conclusion that the proposed measurement model demonstrates discriminant validity.

Having confirmed both convergent and discriminant validity, the model provides a statistically valid measurement basis for the testing of structural relationships in the data, and therefore usage for SEM parameter estimation.

RESULTS

The expert model was created in Amos SEM software and the parameters estimated with maximum likelihood. In order to achieve model identification, it was necessary to constrain the variance of the measurement error of the creativity index variable. The model had 49 parameters to be estimated, with 279 sample moments in the dataset, leaving 227 degrees of freedom. The estimated parameters resulted in a model fit CFI of 0.363 and RMSEA of 0.134. These indicate fairly poor fit between the

expert model and the empirical data. As such, they form a relatively weak basis for interpreting causal path estimates.

Nevertheless, the estimated path weight parameters for this model were all of the expected positive signs. The mediating position of creativity in this model shows a strong influence from novelty seeking, but only a very small resulting influence on novelty production. Figure 3 shows the resulting path estimates for this model.

The alternative model (modified from the expert model to treat novelty production and creativity similarly) was also created in Amos SEM software and the parameters estimated. Again it was necessary to constrain the variance of the measurement error of the creativity index variable to achieve model identification. The model again had 227 degrees of freedom. The estimated parameters resulted in a fit CFI of 0.515 and RMSEA of 0.112 for this alternative model. These goodness-of-fit results are significantly better than those of the initial expert model.

As with the expert model, the estimated path weight parameters for this model were all of the expected positive signs. Moreover, the magnitudes of the causal path estimates are consistent with a theory in which novelty production and creativity are synonymous. Figure 4 shows the resulting path estimates for this model.

DISCUSSION

The empirical results obtained in this study are highly dependent on the dataset that was used. This data was collected from undergraduate business students in Canada, either enrolled in a second-year course in general marketing or in a third-year course in entrepreneurship. Due to the relatively small sample size, no attempt has been made to test for differences in parameter estimates between these groups (such as through nested SEM analysis).

With respect to the model based on expert opinion, the low degree of model fit to the empirical data can be attributed to two possible causes. Either the expert opinion about precedence relationships is mistaken somehow, or the small dataset is insufficient to adequately demonstrate good fit. The path weight estimates for this model suggest that creativity does not play a significant role in moderating elements of mindfulness towards the production of novelty—in contrast to the opinions expressed by the expert group.

With respect to the alternative model, the fit metrics are both substantially improved, indicating that this model specification is substantially better-supported by the empirical data. The CFI metrics is however still somewhat low, suggesting that the model specification still lacks other variables with significant explanatory power. In this model, creativity (as measured by the ATTA Creativity Index) is, like novelty production, significantly influenced by sensitivity to context and awareness of multiple perspectives. It is noteworthy that awareness of multiple perspectives is the greater influence on both novelty production and creativity. But the extent of this advantage differs for the two dependent variables. In the case of novelty production, awareness of multiple perspectives is only slightly more influential than sensitivity to context. But in

the case of creativity, awareness of multiple perspectives has an order of magnitude greater influence than does sensitivity to context.

The large difference in CFI between the two models suggests that creativity does not play a mediating role among the various elements of mindfulness. Rather, there is greater evidence to suggest that *creativity is a consequence of mindfulness*, at least in the context of entrepreneurial business students. The support for the second model can be interpreted to say that the desire for innovation and novelty acts as a trigger to increase mindfulness in individuals—increasing both their sensitivity to nuances of context and their ability and willingness to adopt perspectives different than their own. These two heightened qualities then lead to two notable consequences. First, there is increased individual creativity, and second there is an increase in the production of novelty. These two outcomes appear to be conceptually very similar.

The conclusions of this study are provisional and exploratory in nature. The sample is small and not easily generalizable to broader populations of entrepreneurs, or to more general populations. As a result, both models exhibited relatively low fit metrics, and therefore should be interpreted with some caution.

IMPLICATIONS

These results clearly suggest a connection between individual mindfulness and creativity that has heretofore been largely overlooked by entrepreneurship and innovation scholars. Mindfulness appears to be a clear contributor to the development of increased creativity and innovation. If this relationship can be further confirmed with subsequent research, this may have important practical implications for the development of increased creativity and innovation by individual entrepreneurs.

The support for a conception of creativity on par with the novelty production element poses an interesting challenge to the Western view of mindfulness, as represented by Langer. At their broadest, these results could be interpreted to suggest that novelty production is just a manifestation of creativity, and not an integral element of mindfulness

(which ought to therefore be reconceptualised to focus on sensitivity to context and awareness of multiple perspectives). Given the increasing research attention being paid to mindfulness in various cognitive contexts, this potential for construct reconceptualization may also have important implications for future researchers.

In this study, creativity and mindful novelty production have appeared to be very similar constructs with similar antecedent relationships. What has not been tested in this study is whether they are identical and commensurate, or whether creativity is itself an antecedent to the production of novelty (i.e., whether mindfulness increases creative ideation, which then leads to the development of novel products). Such follow-on directions may be worthy of follow-on studies with larger and more generalizable datasets.

This study has been an exploration of the relationship between mindfulness and creativity in the context of entrepreneurial innovation. It has found evidence to suggest that mindfulness is an antecedent factor in the development of creativity, and therefore a potential avenue for increasing the innovativeness of entrepreneurs. It has also raised questions about currently academic conceptualizations of mindfulness and their appropriate role and fit with the nomology of entrepreneurial cognitions.

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