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Connecting Creativity With Intuitive Knowing

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Abstract

"Eureka!" as he dashed out from the bath, Archimedes shouted, while running naked. This event marked a historical moment of intuition and creativity of human beings. Although modern business leaders value the relation between intuition and creation, there is little guidance on the topic. That is, there does not seem to be sufficient research on the correlation between intuition and creation – especially on the relation between intuition and creative process. By specifying "schematic intuition" and "non-schematic intuition" according to their respective characteristics, this paper will investigate the relation between intuition and creative process, and verify the correlation between the two with questionnaire survey results. The findings of this paper can be summarized as follows: (a) Incubation and illumination are correlated with non-schematic intuition. (b) Schematic intuition has correlation only with illumination. The author investigates the causes of the result and argues that corporate organization can enhance intuition and creativity by ameliorating its environment.

Key words: Creative process; Schematic intuition; Non-schematic intuition

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INTRODUCTION

Moments of "direct knowing" have been documented throughout human history (Dutton, 2014), one of the most famous being Archimedes' "Eureka," an exclamation that is now regularly attributed to the celebration of discoveries. Such moments of "direct knowing" have been documented throughout human history (Ibid.), one of the most famous being Archimedes' "Eureka," an exclamation that is now regularly attributed to the celebration of discoveries.

Direct knowing implies the absence of conscious information processing; further, it does not specify the accuracy of the outcome of such processing. As Vaughan (1979) stated, it involves knowing something without knowing how. This is commonly considered the original understanding of intuition (Behling & Eckel, 1991; Sinclair, 2011). Several features of intuition that reflect the modality of "directly" being free from preconditions have been highlighted in previous literature; specifically, intuition has been described as: instantaneous, spontaneous, a-logical, tacit, holistic, and confident (Kahneman, 2003; Sadler-Smith, 2008). In other words, intuition is rapid, does not involve effort, and cannot be intentionally controlled; it does not conflict with the rules of logic, but does not follow them, either; when people have intuitive experiences, they cannot explain how they arrived at the results; the newly created solution relates to the entire problem rather than parts of it; and, finally, the intuiting person feels confident that "this is it!" All of these features are in accordance with the nature of direct knowing.

In direct knowing, intuiting can utilize dual forms of processing: Experiential and rational; and it can be of a holistic or an inferential nature. Some researchers have categorized intuiting as a style rather than a processing function, and proposed that in nonlocal intuition, no information processing occurs at all, as we only receive

prepackaged information; meanwhile, for local intuition, they have assumed that an intuitive outcome is the result of processed information that we hold in our mental schema or affectively coded memories, or that we have been exposed to through learning, reading, or other forms of cursory exposure.

The above-categorized forms of intuition all share a common trait of producing "aha!" moments, which usually occur the instant a surprising new idea appears in our minds. Nevertheless, in order to have such an "aha!" moment, as well as subsequent moments, it must be recognized that some of these thoughts are impacted by learned schema, while some are purely free from mental schema. The output of such pure intuition in conjunction with a high degree of freedom from schema is extremely original creativeness; in some cases it can be transcendental.

In previous decades, the majority of research on intuition focused on so-called "expert intuition" and, consequently, creative intuition has been relatively under-researched. Thus, there is a lack of knowledge concerning the role intuition plays in creative processes. Considering this, this study attempts to explore the associations between intuition and creative processes and, borrowing from Dane and Pratt (2009), Kahneman and Klein (2009), and Sinclair (2011), proposes the concept of *degree of freedom from schema*, which reflects the use of schema, or lack thereof, in direct knowing.

A. Non-Schematic Intuition (NSI)

In the 1920s, students attended the Bauhaus School to learn new approaches to art and modern design. Here, one of the most influential educating methods for cultivating students' creative originality was the statement "starting from zero," which later became a popular design principle in international architecture, interior design, industrial design, and more. Students were taught to un-learn what they knew, and to let go of everything and use the power of clarity to hear their minds. In other words, in order to create original designs, students were encouraged to reset their experiences and to adopt an *a-priori* modality.

Mintzberg (1989) and Langley et al. (1995) argue that it is possible for non-experience decision-makers to obtain answers intuitively. Further, Baylor (2001) tentatively suggests that novices can develop intuitive thoughts because they lack experienced schema relating to the subject, which could interfere with their ability to generate novel insights. Moreover, Simon (1987) and Wally and Baum (1994) suggest that intuition is an unconscious ability that transcends an individual's consciousness, because the conscious functions of thinking, feeling, and sensing frame the greatest obstacles to intuition; in other words, sensation, with its impacting stimuli, disturbs intuition's clear, unbiased, naïve awareness. Writing on this topic, Carl Jung (1927) stated: "The world of consciousness is inevitably a world full of restrictions, of walls blocking the way. It is of necessity one-sided, because of the nature of consciousness itself. No consciousness can harbor more than a very small number of simultaneous conceptions [for our general-orientation needs]" (p.20). Further, he also stated:

> If consciousness is emptied as far as possible of its contents, they will fall into a state of unconsciousness, at least for the time being. In Zen, this displacement usually results from the energy being withdrawn from conscious contents and transferred either to the conception of emptiness or to the Koan. […] The energy thus saved goes over to the unconscious... (p.21)

Through intuition, a psychological perception can travel from a person's unconscious to their consciousness; furthermore, intuition can even reveal the sequence of the perception's creation. Thus, intuition is an indispensable factor of all spiritual operation processes (Hyde et al., 1992). Jung (1963) described that, in his everyday life, he often encountered the kind of perception through which he suddenly knew something. Knowledge emerged in his mind as if he had developed it independently. Therefore, intuition is not a product of conscious action, but rather an unconscious perception that does not originate from judgment activity (Jung, 1964). The challenge is that the emptying and closing of consciousness is no easy matter; Steve Jobs stated that "it is a discipline" (Isaacson, 2012).

Evolving literature regarding intuition and direct knowing is creating avenues for discovering myths concerning intuition. When an individual has a high *degree of freedom from schema*, they can occasionally, through their non-experience, perceive matters that exceed the conceptual boundaries of time and space and, thus, transcend their consciousness' range of perception; it is as if they have domains of their psyche in several different places at once (Jung, 1976; Stein, 1998). Jung (1976) argues that a certain kind of "immediacy" exists in unconsciousness that is not based on a cause-and effect-relationship; further, this theory is supported by the physicist David Bohm who, when explaining the concept of implicate order, stated that energy can exist simultaneously, both locally and non-locally (Sinclair & Ashkanasy, 2005).

It can also be said that NSI involves a keen sense of gut feeling, enabling it to identify potential avenues for future development and to engage in the germination of concepts (Jung, 1927). Further, such intuition can be likened to a premonition, a prophecy, a miraculous power (Jung, 1976), or just a sense of future foreboding felt through one's "gut feeling" (Pretz et al., 2014). Pretz et al. (2014) and Sinclair (2011) named this "intuitive foresight."

Another aspect of NSI is that it originates from congenital inheritance. It is based on the accumulated wisdom of our ancestors, and is formed through evolution. People possess this inborn ability in a certain form; it is a powerful teacher to mankind and one of the most common natural abilities we have (Hodgkinson et al., 2008). It can also be considered to constitute a kind of unconscious

comprehension of highly-complex scenarios (Jung, 1960). In particular, it can be defined as the accumulation of common experiences within organisms' minds, with this accumulated knowledge being passed on to the next generation; after a behavior is repeated millions of times, it eventually coheres into an archetype that can only be comprehended through intuition, and can only be utilized through comprehension (Jung, 1927). Sinclair (2011), considering this aspect of NSI, named this archetype "intuitive creativity."

B. Schematic Intuition (SI)

Another kind of intuition is low *degree of freedom from schema*, which concerns the assistance of schema in direct knowing. Simon (1995) argues that intuition comes from long-term experience, and is provided by the knowledge stored in long-term memory; this knowledge is primarily acquired by learning in related fields. This kind of input is automatic and unnoticeable, and the emergence of the input process can be based on judgments and decisions. For example, knowing the techniques and rules concerning grasping are crucial for a dancer; however, this merely represents a beginning. Every day, the dancer must practice these techniques before he/she can finally begin to modify them. This result—the modification of techniques—is a creative action that relies on the intuition of the dancer and, in this case, this intuition originates from proficiency in dance techniques (Janesick, 2001).

Similarly, Kahneman (2012) discussed "fast thinking," arguing that it includes various kinds of intuitional thinking, the entirety of automatic perception, and the psychological activity of memory; this is especially true for professionals, as their keen intuition is based on their accumulation of long-term experience. When people encounter certain familiar situations, they can react automatically by utilizing the abilities that have been honed through the accumulation of personal experiences (Duggan, 2007). In other words, people induce intuition in their professional roles by utilizing the knowledge and long-term experiences that they have previously accumulated (Dane & Pratt, 2007).

Another characteristic of SI is, as some scholars argue, that intuition in professionals is merely the result of the rapid identification of familiar clues and the application of suitable response measures (Akinci & Sadler-Smith, 2012). According to this theory, when a message received unconsciously matches another message that is already stored in the brain, intuition occurs (Raidl & Lubart, 2001); therefore, intuition represents a form of "re-recognition" that commences once an outer stimulus has been matched with a memory stored in the brain (Simon, 1992). For example, when chess champions are confronted with certain scenarios during a match, they can almost immediately develop suitable strategies; this is because chess champions store a massive quantity of different layouts in their long-term memories. Knowledge is stored in the human memory system in the form of schema; one schema represents "a type of stimulus or a piece of conceptual knowledge, including its attributes and the relationship between these attributes" (Fiske & Taylor, 1991). When people comprehend and process matters, "schema" form a framework of expectations that is based on current knowledge, and this consequently results in the creation of a guiding function and the development of a relationship between the schema and the framework; thereby creating an intuitional reaction. Bowers et al. (1990) propose that coherent clues activate relevant memory networks and, thus, induce intuition; that is, intuition only occurs in familiar situations, such as when accountants and lawyers engage in their respective businesses (Duggan, 2007). Further, Harteis and Billet (2013) also suggest that, due to the familiarity of their tasks, professionals commonly do not need to engage in conscious thinking and action. Thus, it can be said that intuition stems from previous knowledge, is based on past experiences, and that the derived idea is based on the decision-maker's previous experience and their cognition of emotional investment.

Further, emotion is the most important source of motivation in regard to this form of intuition. People pursue active emotional behaviors, and try to avoid passive emotional behaviors; without emotion, there is no associative learning and, thus, no intuition system (Dane & Pratt, 2007). Although emotion can both provide certain benefits to, and obstruct, intuition, the effect is, however, dependent on the type of emotion in question (Sadler-Smith et al., 2008). Moreover, it is generally considered that in situations where uncertainty and time pressure is higher, people tend to apply methods in which they are experienced, instead of performing deliberate analysis (Allinson & Hayes, 1996); this is because, when people feel pressure, they tend to link their processing methods to particular fields, consequently facilitating rapid intuition. It is for this reason that, when facing extreme time pressure, people usually tend to rely on intuitive decision-making (Dörfler & Ackermann, 2012).

C. Creative Process

Although many different views on the creative process have been proposed in previous studies, Wallas' four-stage theory (preparation, incubation, illumination, and verification) is still the most commonly applied stage theory (Kaufman & Sternberg, 2010). Therefore, this study's analysis is based on Wallas' theory; the four stages are explained below.

For some issues, it usually takes a conscious analysis, even if it does not directly lead to solutions and problems before shelving (Gilhooly, 2016). Preparation (Pre) concerns the autonomous, conscious creation of an ordered stream of thoughts (Wallas, 1926). Further, Pre is related to possess analysis ability and the requisite knowledge to solve problems. The main function of Pre is to collect and/or reactivate relevant information

and resources, which can be conducted by discovering or highlighting, defining, categorizing, and analyzing a problem (Lubart, 2001). Furthermore, Pre is also related to the embracing of new knowledge (Goleman et al., 1998).

The entire process of incubation (Inc) occurs unconsciously (Goleman et al., 1998). Wallas (1926) argues that Inc has two attributes: it does not involve autonomously or consciously considering specific problems, and it does not involve intellectual work, such as "awareness." However, while Inc is occurring, the brain is still working, forming serial associations, connections, and/or combinations; furthermore, other unconscious and non-autonomous psychological processes may also be ongoing. A series of studies conducted by Dijksterhuis (2004) define Inc as unconscious thought and support the theory that this unconscious process promotes creativity. The findings of Gilhooly (2016) also support this view. Moreover, Sinclair (2011) categorized intuition into three groups (intuitive expertise, intuitive creation, and intuitive foresight), in which she stated that "intuitive creation" combines with current modes in a novel and creative fashion and regularly undergoes a long period of Inc.

Illumination (Ill) concerns the development of a solution to a problem or the sudden emergence of a new thought. As Henri Poincaré states, "...at first one will not gain anything, and then, after a flash, a crucial notion emerges in mind..." (May, 1994). Lubart (2001) consequently labelled this development of an idea as a "flash". Poincaré further elucidates that the emergence of new notions occurs in a sudden and unexpected fashion; however, Wallas (1926) argues that before new notions come into existence, it is possible to vaguely perceive their approach through "fringe consciousness" or "intimation." Consequently, in Wallas' theory, Ill consists of two parts: (a) "fringe consciousness," in which an idea is about to move from unconsciousness to consciousness, and (b) the very moment when creativity occurs.

Lastly, verification (Ver), like Pre, is a conscious process, and depends on the same logical rules as Pre (Sadler-Smith, 2015). This study is based on Kaufman and Sternberg (2010), who indicated that the Ver stage is when one verifies his/her notions or adopts solution(s) to a problem; this stage concerns the evaluation, abstraction, and development of one's thoughts. Moreover, in this stage, notions and viewpoints submitted through Ill can be evaluated, verified, and/or modified (Lubart, 2001).

In previous literature, there has been considerable study on both intuition and creativity. Most of these studies suggest that a relationship between intuition and creativity does indeed exist. However, previous guidance on the topic is limited either to examinations of the correlation of intuition and creative personality traits, or to the correlation of intuition and product creation. Thus, research on the relationship between intuition and the creation process is relatively insufficient. Consequently, this paper endeavors to discuss the relationship between intuition and creation process with the assistance of the above-mentioned concept of "degree of freedom from schema."

From the literature, we find that research on creativity and intuition rarely tries to understand the relation between intuition and the creative process. Understanding this relation will not only provide a new perspective on the process of investigation, and independently promote the development of individual creativity, but also allow businesses to provide an environment that can promote the development of creativity.

1. MATERIALS AND METHODS

1.1 Research Hypotheses

Summarizing the previous points discussed, we find that the common descriptions of Pre ("confirming the existence of a problem," "collecting a wide range of information," "finding relevant information," "finding margins or inconsistencies," "highlighting a new problem," etc.) (Lubart, 2001; Amabile, 1996; Getzels & Csikszentmihalyi, 1976) relate to reasoning, and can all be classified as activities that occur on the plane of consciousness. However, intuition is direct knowing (Dutton 2014); regardless of whether it is SI or NSI. Thus, for this study, the following two hypotheses were created:

H1: Schematic intuition is not correlated with preparation.

H2: Non-schematic intuition is not correlated with preparation.

A series of studies performed by Dijksterhuis and other scholars (e.g., Dijksterhuis & Nordgren, 2006; Dijksterhuis & Strick, 2016) have indicated that, to a certain degree, Inc is conducted by the unconscious mind; further, as part of this process, serial association is covertly formed in the brain (Bowers et al., 1990), and many connections or combinations of notions occur at this stage. That is, a high degree of freedom from the schema may be activated in this stage and, consequently, NSI may very likely begin functioning here.

On the other hand, as an element of low degree of freedom from schema, SI is the intuition induced when a piece of received information unconsciously corresponds to another piece of information that is already stored in the brain. However, in the modality of Inc that is heavily based on pure unconsciousness, SI, constrained to schema, is not activated. Therefore, the third and fourth hypotheses were as follows:

H3: Non-schematic intuition is correlated with incubation.

H4: Schematic intuition is not correlated with incubation.

"Intimation," which is the state in which unconsciousness gradually phases into consciousness, begins while Ill is still in a stage of unconsciousness (Wallas, 1926). During this period, one may be influenced by outer factors and, thus, activate long-term memories or induce chain reactions (Ritter & Dijksterhuis, 2014). Given the fact that, at this point, Ill is still in a state of unconsciousness, high degree of freedom from schema can activate; that is, NSI can occur. However, in this vague process in which an idea gradually enters consciousness, as one cannot be both completely unconscious and in a conscious state, low degree of freedom from schema may also activate; that is, SI may occur. For example, Stierand and Dörfler (2015) claim that in a professional chef's creation process, intuition functions through a rapid circulation between the production and evaluation of ideas; if observed as a creative process, such production of ideas can be considered a novel organization of knowledge through the application of intuitive insight and, through this process, new knowledge is consequently created.

The production of ideas is induced when creativity occurs, that is, in the Ill stage; on the other hand, the evaluation of ideas, which occurs in the next stage, Ver, concerns the use of judgment to transfer factors involved in decision-making into memory. Thus, considering the above description, the fifth and sixth hypotheses were as follows:

H5: Schematic intuition is correlated with illumination.

H6: Non-schematic intuition is correlated with illumination.

In the Ill stage, even if some groundbreaking insight is developed, if one does not turn his/her insight into action and their inspiration into facts, his/her actions cannot be deemed creative actions (Goleman et al., 1998). As Poincare highlights, Ver is completely controlled by "consciousness;" in this stage, people utilize many logical rules that are identical to those of Pre, and consciously endeavor to control Ver (Wallas, 1926). In essence, Ver is a stage in which intuition cannot occur in unconscious layers. As a result, the author submits the following hypotheses:

H7: Schematic intuition is not correlated with verification.

H8: Non-schematic intuition is not correlated with verification.

1.2 Development of a New Scale

As no scale suitable for this study had been developed in previous literature, the author developed a new scale. This scale is included in the supporting information.

The items of the scale provided to this study' participants were divided into two categories: (a) items that were quoted directly from the newly developed scale (these were translated into the participants' local language (Chinese), adhering to the following guiding principles: simplicity, clearness, straight-forwardness, and conciseness); and (b) items that were developed by the author based on concepts described in previous literature and then compiled in the local language.

After the questionnaire was composed, it was examined by scholars from related fields to ensure that it accurately presented the original items and the existing theories. Then, the author had students with various levels of education read the questionnaire to ensure that the participants would be able to appropriately understand the items. Finally, the author requested a third party translate the items of the scale from Chinese back into English, and then the author compared the back-translated items to the original ones to determine if there were any inconsistencies in terms of meaning.

On the first page of the questionnaire, general information concerning this paper was provided, including its purpose, its target respondents, the content of the scale used, the correct method of answering the questionnaire, and the time it would take to answer.

1.3 Pilot Result

Once the questionnaire was composed, a pilot test was conducted. Here, 120 questionnaires were distributed and 101 were recovered; of these, 97 were valid, giving an effective response rate of 80.8%. Before conducting analysis on the valid questionnaires, a KS-test and Q-Q plot were conducted. Then, "descriptive statistical analysis," a "homogeneity test," and "Grubbs' test for outliers" were conducted. Furthermore, by utilizing PCA, those with eigenvalues exceeding 1 were chosen to undergo factor analysis using Varimax rotation. Consequently, all KMO values were found to be 0.9 or higher; further, the result of Bartlett's Sphericity Test was also found to reach significance. Next, a scree plot was conducted, and it was found that, on the same dimension, most of the factor loadings of items exceeded 0.5, indicating that the questionnaire was valid, as it fulfilled convergent validity, discriminant validity, and construct validity requirements. Lastly, for every scale Cronbach's α reached 0.987 or above.

2. RESULTS

2.1 Formal Result

As one of the variables in this study is SI, participants who had both working and social experience were considered to be more suitable for the requirements of this study. Therefore, all participants were office workers in Taiwan. Questionnaires were distributed to 450 individuals and, of the recovered responses, 359 were found to be valid, giving an effective response rate of 79.78%. Of the respondents, 51% were male and 49% were female, most were 41-45 years old (18.9%), and the most common level of education was college education (61.3%).

Before examining the responses using structural equation models, the author examined every value provided in the questionnaire. Consequently, it was found that for the sample data, the average values were 2.78, 2.53, and 2.48; there was no significant deviation in any dimension; and the standard deviation was between 0.77 and 1.06. Then, Pearson correlation analysis was conducted, and values for the relationship between NSI and Inc were found to reach 0.05, as did the values for NSI and Ill, while values for NSI and Ver reached 0.01; all of which indicates significant correlation. Furthermore, values for the relationship between SI and Inc and for SI and Ill reached 0.05, indicating that they are significantly correlated.

Cronbach's α for NSI and SI were 0.901 and 0.934, respectively, while Cronbach's α for the four stages of creative process were 0.880, 0.872, 0.894, and 0.903, respectively.

Next, in order to examine the construct validity of the scale, a CFA test was conducted. The results of this are shown in Table 1.

Table 1
The results of the CFA Test on Each Element of the Scale

	NSI	SI	Pre	Inc	Ill	Ver
χ^2 *P*	.000	.000	.000	.000	.000	.000
χ^2/df	1.551	2.444	2.869	2.548	2.894	2.834
GFI	0.968	0.935	0.971	0.984	0.969	0.972
TLI	0.986	0.951	0.965	0.975	0.965	0.973
CFI	0.989	0.963	0.979	0.987	0.976	0.984
NFI	0.971	0.937	0.97	0.982	0.966	0.977
IFI	0.989	0.963	0.979	0.987	0.975	0.984
RMSEA	0.039	0.062	0.08	0.076	0.077	0.077
CR	0.82-0.88	0.80-0.87	0.87	0.87	0.89	0.9
AVE	0.54-0.71	0.58-0.69	0.55	0.58	0.55	0.61
Cronbach's α	0.82-0.89	0.80-0.87	0.88	0.87	0.89	0.9
Factor loadings	0.64-0.94	0.70-0.86	0.82-0.87	0.76-0.85	0.77-0.87	0.87-0.89

Note. Pre: preparation; Inc: incubation; Ill: illumination; Ver: verification; NSI: non-schematic intuition; SI: schematic intuition; GFI: goodness-of-fit index; TLI: Tucker Lewis index; CFI: comparative fit index; NFI: normed fit index; IFI: Bollen's Incremental Fit Index; RMSEA: root mean square error of approximation; CR: composite reliability; AVE: average variance explained.

Table 1 shows that the research model had an acceptable goodness of fit (GFI = 0.94 ~ 0.98; CFI = 0.98 ~ 0.99; RMSEA = 0.04 ~ 0.08; $\chi 2/df$ = 1.6~2.9, p = .000). Every factor loading reached significance and exceeded 0.64, and every AVE value exceeded 0.54, indicating a satisfactory level of convergent validity. Further, all composite reliability values and all Cronbach's α exceeded 0.8, indicating an acceptable level of internal quality.

2.2 Verification of the Hypotheses

2.2.1 Test of the Overall Goodness-of-Fit of the Research Structure

In this study, the latent independent variables were NSI and SI, while the latent dependent variables were the four stages of the creative process. Hypothesis testing was conducted utilizing the SEM model.

According to Segars (1997), if GFI, NFI, IFI, and CFI values all exceed 0.90, and the AGFI value exceeds 0.80, the fit is considered acceptable; consequently, the results for the goodness-of-fit test of this study's overall model (χ^2/df = 1.92, GFI = 0.91, CFI = 0.94, TLI = 0.92, NFI = 0.91, IFI = 0.93, RMSEA = 0.05, AGFI = 0.84) indicated that the measurement model and the goodness of fit of the data were acceptable.

2.2.2 SEM Model Analysis of the Overall Relationship

The estimate of this study's SEM model was conducted using ML analysis. As there were 359 participants in this study, the number of parameters exceeded 50; therefore, the method applied in this section was deemed appropriate.

Table 2
Standardized Regression Coefficients

			Estimate	Regression S.E.	C.R. Weights	*P*	Standardized estimate
Pre	<——	NSI	.005	.084	.063	.950	.004
Inc	<——	NSI	.656	.119	5.501	***	.380
Ill	<——	NSI	.764	.099	7.731	***	.568
Ver	<——	NSI	.111	.103	1.082	.279	.068
Pre	<——	SI	.074	.068	1.093	.274	.065
Inc	<——	SI	.234	.086	2.722	.006	.159
Ill	<——	SI	.470	.069	6.849	***	.409
Ver	<——	SI	.154	.083	1.859	.063	.109

Note. Pre: preparation; Inc: incubation; Ill: illumination; Ver: verification; NSI: non-schematic intuition; SI: schematic intuition

3. DISCUSSION

Wallas (1926) pointed out that in Pre, our thinking will find the possibility of the problem initiatively. As a result, the readiness period opens, if only vaguely, to anything related to self-access, and gathers information widely so that unusual and seemingly unrelated elements emerge gradually (Goleman et al., 1998; Wallas, 1926). These traits all emerge from "conscious" behavior; however, intuition comes from unconsciousness. Thus, Pre is irrelevant to "unconsciousness." The values obtained for the relationship between NSI and Pre in this study were β = .00, CR = .06, P(= .95) > .05, while for the relationship between SI and Pre they were β = .07, CR = 1.09, P(= .27) > .05. (see Table 2 and Figure 1). Neither of the two sets of data reached significance, indicating that neither NSI nor SI were correlated with Pre. This supports Hypotheses 1 and 2 because, during Pre, people are constantly thinking and consciously exploring, but all intuition comes from the unconscious.

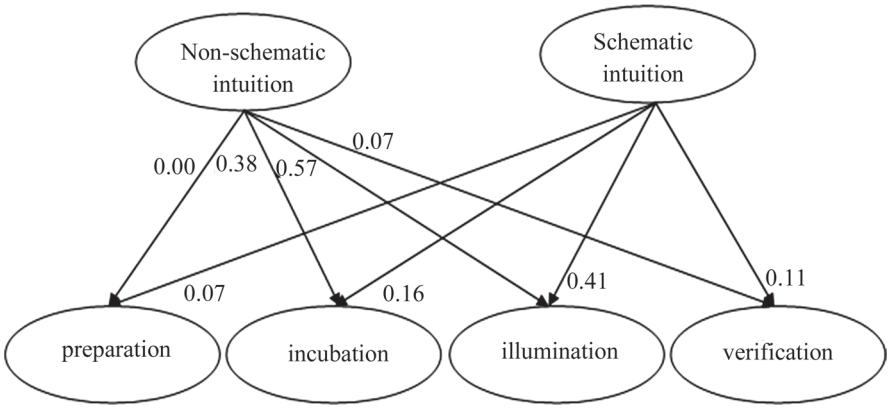

Figure 1
SEM Model Analysis of the Overall Relationship

The data values for the relationship between NSI and Inc were β = .38, CR = 5.50, P < 0.001, which reached significance, while for SI and Inc they were β = 0.16, CR = 2.72, P(= 0.006) > 0.001, which, although reached significance, did not reach a significance level of 0.001. This result supports Hypotheses 3 and 4. That is, Inc was correlated with NSI, but not with SI. Examining the series of studies conducted by Dijksterhuis, one can realize the role unconscious thoughts play during Inc. Although the two kinds of intuition occur unconsciously, the characteristics of Inc provide NSI with a favorable environment in which to grow, allowing it to autonomously induce a high degree of freedom from the schema. However, the Inc environment can also provide SI with suitable conditions to function. Therefore, the two kinds of intuition work differently in the Inc phase. This result also reminds us that, regardless of the setting, if one hopes to perform NSI, they must secure sufficient environmental conditions. On the other hand, SI is initiated through proficiency in techniques, the result of flash identification of familiar clues; it operates through a low degree of freedom from the schema. Here, Inc relates to the creative stage of consciously ignoring a problem for a period, which is then followed by the unconscious offering a solution; it is a modality of unlearning what has previously been learned. Thus, SI, obtaining solutions in a new but predictable manner, does not function properly in the Inc stage. This result also reminds us that for organization innovation, if one hopes to let NSI take effect, it is important that they surround themselves with suitable environmental conditions.

The data values for the relationship between NSI and Ill were β = .57, CR = 7.73, P < 0.001, which reached significance, while for SI and Ill they were β = 0.41, CR = 6.85, P < 0.001, also reaching significance. This result supports Hypotheses 5 and 6; that is, Ill was correlated with both NSI and SI. Jung (1966) once described artists' original works as a kind of "autonomous complex"; Jung used this metaphor to elucidate intuition – a mental structure located in unconsciousness that enters the domain of consciousness when it has sufficient energy. This is also how Wallas describes "intimation." When breaking through unconsciousness and, thus, entering the domain of consciousness, intimation becomes creativity; moreover, as this state comes into contact with consciousness, low degree of freedom from schema is subsequently activated, which induces SI. As Stierand and Dörfler (2015) highlighted, the function of intuition in a professional chef's creation process is the rapid circulation of feedback and feedforward between the production and evaluation of ideas. Thus, in essence, once professional knowledge and experience enter unconsciousness, when an outer stimulus is introduced, it is collated into the memory database, inducing a flash; soon afterwards, the collation result is relayed to unconsciousness, where it then induces new thoughts. This kind of feedback and circulation of SI promotes the induction of creative thoughts in the Ill stage.

From the description of Ver by Wallas (1926) and Goleman et al. (1998), its characteristics include the following: entirely under the control of consciousness and developing one's own thoughts, turning insight into action, transform into fact, so that the type and degree of intuition at the unconscious level do not affect the verification period. The data values from this study for the relationship between NSI and Ver were β = .07, CR = 1.08, P(= .279) > 0.05; while for SI and Ver they were β = 0.11, CR = 1.86, P(= .063) > 0.05; neither of these reached significance. That is, neither NSI nor SI were correlated with Ver. This result supports Hypotheses 7 and 8. Ver, similar to Pre, is a stage that is fully controlled "consciously"; consequently, intuition, which originates in unconsciousness, has no effect on the Ver stage.

CONCLUSION

This study's findings confirmed our assumption that intuition can be categorized into "schematic intuition" and "non-schematic intuition" based on their respective characteristics. It also offers an explanation of "eureka" experiences, in which non-schematic intuition is invoked in the incubation and illumination stages of creative processes, while schematic intuition is associated with the illumination stage. This result is empirically consistent with the viewpoint of Sinclair (2011) regarding the influence of intuition on creative production. Based on the result of this study, it can be suggested that organizations that wish to enhance the creativity of their employees make efforts to enhance the employees' intuitional ability and provide favorable environments and regulations; this would allow the seeds of creativity to strengthen themselves through incubation and grow through illumination. Meanwhile, for individuals who wish to enhance their own creativity, they can practice unleashing their intuitional ability in incubation by clearing their minds of their conscious thoughts.

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APPENDIX

Non-schematic

No.	Item	Origin of concept
1	When I am calm, I can sense more subtle, minor matters.	Isaacson, 2011
2	In everyday life, I often have a foreboding that makes me feel that the development of a certain issue is imminent.	Sharp, 1987
3	I utilize holidays/vacations to clear my mind.	Jung, 1927
4	I often make decisions based on my gut feelings, even when the decision is contrary to objective information.	TInt 13
5	The answer(s) to problem(s) emerge in my dreams.	Jung, 1976
6	Inspiration suddenly comes to me when I am sitting still.	Jung, 1976
7	When I am daydreaming, some extraordinary thoughts suddenly emerge.	Goleman et al., 1998
8	When I relax and clear my mind, I feel as if I am "reset to zero."	Murray, 2009
9	I can usually feel when a person is right or wrong, even if I can't explain how I know.	REI 19
10	I hardly ever make the wrong choice when I listen to my inner-most gut feelings while making a decision.	REI 37
11	I trust my initial feelings about people.	REI 25
12	I will listen to possible answer(s) suggested by the voice in my heart.	Steven Spielberg Commencement Speech, Harvard University, May 2016
13	My instant judgment on matters/issues is above average.	Dörfler and Ackermann, 2012
14	I often sense the possible upcoming development of certain matters.	Pretz et al., 2014

*TIntS - The Types of Intuition Scale, *REI - Rational Experiential Inventory

Schematic

No.	Item	Origin of concept
1	My previous instances of intuition have always been relevant to certain incident(s)/ matter(s) in my memory.	Duggan, 2007
2	I often have a feeling of déjà vu in regard to my intuition.	Raidl and Lubart, 2001
3	When faced with familiar situations, I can usually come up with a solution without thinking.	Akinci and Sadler-Smith, 2012
4	In general, my decisions at work are much more influenced by industry experience and lessons learned than by the results of formal research and the systematic evaluation of alternatives.	BII 2
5	Using my gut feeling usually works well for me when I attempt to solve problems in my life.	REI 33
6	Memories formed by past experiences are helpful for quickly negotiating matters in the outer world.	Dane and Pratt, 2007
7	Due to the abundance of my work experience, I can perceive matters and recognize issues that others cannot.	Duggan, 2007
8	Accumulated experience is very useful in work when making judgments on presentiments.	Kahneman, 2012
9	When faced with a familiar situation, I will instantly and automatically think of a solution in my head.	Akinci and Sadler-Smith, 2012
10	When addressing familiar tasks, I can make judgment(s) instantly, without any conscious thinking.	Akinci and Sadler-Smith, 2012
11	The higher the degree of experience and proficiency, the more likely unconventional solutions will be produced.	Crossan, Lane, and White, 1999
12	The more I encounter similar situations, the less I need to think in order to solve such matters.	Harteis and Billett, 2013
13	It is difficult to have good intuition when one does not have sufficient work experience.	Klein, 2003
14	Familiar problems can often be solved intuitively.	TInts 4
15	It is easier to apply intuition when there are time constraints in effect.	Allinson and Hayes, 1996
16	The higher the level of work pressure, the easier intuition occurs.	Coutu and Kasparov, 2005
17	My gut decisions at work are almost always accurate when I am under pressure.	BII 18
18	My best ideas or decisions usually happen occur when I am under significant pressure at work.	BII 15
19	The occurrence of intuition grants me a feeling of fearlessness.	Epstein, 2010
20	I often feel joyful when intuition occurs.	Kahneman, 2012
21	When intuition occurs, I usually have a "that's it!" feeling.	Pretz and Totz, 2007
22	When intuition occurs, I feel a sense of certainty in my heart.	Epstein, 2010

*TIntS - The Types of Intuition Scale, *BII - Business Intuitions Inventory, *REI - Rational Experiential Inventory

Creative process

No	Item	Origin of concept
1	I attempt to understand the gap between problems and the current situation.	Lubart, 2000-2001
2	I attempt to identify the inconsistencies between problems and the current situation.	Lubart, 2000-2001
3	When I encounter a problem, I collect a wide range of information in order to reveal the relationships between seemingly unrelated factors.	Goleman et al., 1998
4	I attempt to analyze a poorly clarified problem in order to identify smaller problems that are better clarified.	Dorfman et al., 1996
5	I attempt to examine an original problem from a new angle.	Lubart, 2000-2001
6	When faced with a problem, I repeatedly try to identify the root cause.	Murray, 2009
7	I let my imagination run wild in order to solve a problem.	Goleman et al.,1998
8	Sometimes, after some daydreaming, I suddenly find the solution(s) to problem(s).	Goleman et al.,1998
9	Sometimes, I deliberately think of other matters when I cannot find the solution to a problem.	Murray, 2009
10	When I am unable to think of some good ideas, I take a walk to clear my head.	Berveridge, 1953
11	When I cannot identify the solution to a problem, I like to fantasize without any boundaries or purpose.	Goleman et al., 1998
12	I open my mind to any seemingly irrelevant matters in order to identify solutions to problems.	Wallas, 1926
13	Usually, new thoughts suddenly emerge in a “stroke of genius” fashion.	Berveridge, 1953
14	Often, answers to some problems that were previously unsolvable suddenly and unexpectedly reveal themselves in my head.	Wallas, 1926
15	Most of my new ideas and/or conceptions are produced in an inexplicable fashion.	Tolle, 2004
16	Sometimes, some unusual thoughts suddenly emerge from my unconscious.	Bowers et al., 1990
17	Sometimes, I become aware of blurry, unclarified matters in my mind that seem to be the answers to certain problems.	Wallas, 1926
18	Before thinking of an idea, I sometimes feel that I am somehow aware of its upcoming arrival, although I do not yet know what kind of idea will be produced.	Wallas, 1926
19	When I devise some “solution(s)” for certain problem(s), I attempt to verify whether “the solution(s)” are applicable.	Kaufman and Sternberg, 2010
20	When some new thoughts emerge, I try to realize them.	Kaufman and Sternberg, 2010
21	When new thoughts emerge, I have an immediate urge to realize these thoughts.	Murray, 2009
22	When I have new thoughts, I evaluate the feasibility of these thoughts.	Lubart, 2000-2001
23	When I have new thoughts, I try to transform these thoughts into feasible plan(s).	Murray, 2009
24	When there is a new creative conception produced in my head, I practically verify its feasibility.	Lubart, 2000-2001