Zeszyty Naukowe Uniwersytet Ekonomiczny w Krakowie

5 (983)

ISSN 1898-6447
e-ISSN 2545-3238
Zesz. Nauk. UEK, 2019; 5 (983): 23–36
https://doi.org/10.15678/ZNUEK.2019.0983.0502

Kamila Malewska

Determinants of the Use of Intuition in Decision-making – an Empirical Study*

Abstract

Objective: The aim of the article is to identify the determinants of using intuition in decision-making processes among top management.
Research Design & Methods: Survey method (sample selection: random, stratified disproportionate, data collection method: CATI, sample size: 300 completed questionnaires).
Findings: I produced a typology of the determinants of intuition used in decision-making processes and a proposal for ordering them in a hierarchy.
Implications / Recommendations: The hierarchy of determinants differs depending on the decision-making style represented by the respondents. When valuations were made by respondents representing all decision-making styles, only internal determinants were recognised as crucial. In the opinion of intuitive decision-makers, the factors determining the use of intuition in decision-making practice are, with the exception of experience,

Kamila Malewska, Poznań University of Economics and Business, Theory of Organisation and Management Department, Al. Niepodległości 10, 61-875 Poznań, e-mail: k.malewska@ue.poznan.pl, ORCID: https://orcid.org/0000-0002-0365-6318.

* This publication presents the results of the research project "The impact of managerial intuitive potential on the effectiveness of decision making processes", financed by the National Science Centre, Poland (funds allocated on the basis of decision no. DEC-2014/13/D/HS4/01750).

external and include environmental conditions and the type and structure of the decision problem being confronted.
Contribution: The study identifies and empirically verifies an orginal typology of determinants of intuition used in decision-making.

Keywords: intuition, decision-making, determinants of decision-making, rationality.
JEL Classification: M12.

1. Introduction

Intuition is becoming more and more important in decision-making in business. This is primarily due to the characteristics of the modern market, its comprehensiveness, the diversity of consumer behaviours, the steady increase in the amount of information that needs to be obtained and analysed, the time pressure intensified by technological variability and the shortening of product life cycles (Falkowski & Tyszka 2009, Klein 2010, Krawczyk-Bryłka 2015, p. 132). An additional factor that has increased interest in intuition is the limited effectiveness of traditional, rational decision-making models (Agor 1998, p. 148). The literature provides us with many situations and conditions in which intuition is used (Parikh, Neubauer & Lank 1994, Agor 1998, Bieniok, Halama & Ingram 2006, p. 92). The relationships between selected internal factors such as experience, expert knowledge or personality type and the use of intuition in decision-making processes are also analysed (Kahneman & Klein 2009, Salas, Rosen & DiazGranados 2010, Davis *et al*. 2007, pp. 279–290). However, there is a lack of comprehensive research on the determinants of the use of intuition in decision-making processes, their typology or hierarchy of importance. The following the question can therefore be asked: what factors (both internal and external) encourage the decision-maker to use intuition in decision-making practice?

This article identifies the determinants of the use of intuition in decision--making processes. It contains theoretical, empirical and analytical material in examining these determinants. The theoretical section defines intuition and its importance in the decision making process, and attempts to identify the determinants of its use based on an analysis of the literature. The second part presents the results of my empirical research, including the valuation of the determinants proposed in the theoretical part, taking into account the decision-making method represented by the respondents.

This study on intuition was conducted within the research project "The impact of managerial intuitive potential on the effectiveness of decision making processes", financed by the National Science Centre, Poland (funds allocated on the basis of decision no. DEC-2014/13/D/HS4/01750).

2. Intuition in Decision-making Process

The concept of intuition is widely interpreted in the literature. It is approached from a pragmatic point of view based on scientific research, and also from a spiritual perspective, treating intuition as "God's gift" (Myers 2004, p. 401). Intuitive thinking is similar to perception – it is rapid and comes without mental effort. It is the opposite of deliberate thinking, which is similar to reasoning, critical, analytical and requires a lot of effort. A characteristic feature of intuition lies in the fact that it occurs at least partially or sometimes completely in the sphere of the subconscious, and its effects are difficult to explain logically. This does not mean that intuitive decisions are made accidentally or are the result of guessing. On the contrary, they are often the result of a comprehensive process of synthesis and integration of many isolated facts and elements (Kuhl, Quirin & Koole 2015).

Despite significant interest in intuition among both practitioners and management theorists, there is no universal and generally accepted definition of this term in the literature. Based on the analysis of the proposals formulated by the authors, three attributes of intuition can be identified (Williams 2012, pp. 49–52):

– it is a process of unconscious decision-making,
– it is accompanied by emotions,
– it is associated with holistic information processing.

Most definitions emphasise that intuition is the result of a quick, associative cognitive process. The result of this process is the decision-maker's conviction that a particular solution to the decision problem is correct (Volz & Zander 2014). Research has clearly shown that people with extensive specialist knowledge and significant experience in making decisions can efficiently use intuition. Experience and education enrich the resources of explicit knowledge, which makes it easier for the brain to recognise the problem and make intuitive decisions. Intuition therefore can be defined as a subconscious assessment of the situation and selection of the optimal solution. It is based on latent, experimental – automatic and non-verbal knowledge, but does not use rational – analytical and verbal knowledge (Baldacchino *et al*. 2015, p. 214).

3. Determinants of the Use of Intuition in Decision-making – Theoretical Overview

The decision-making process is often defined as a deliberate and non-accidental act of choosing one variant from at least two solutions to the decision problem. In practice, however, it is a complex process, the result of which depends on many factors, both internal and external (Tyszka 2010). The factors

determining the decision-making process include, among others (Markowski 2012, p. 27; Zychowicz 2017): qualifications, experience and psychophysical features of the decision-maker, the way decisions are made, the quality of information decision-makers obtain, the nature of the decision problem and decision situation, and the use of decision support systems. These factors can be related to both rational and intuitive decision-making. Therefore, the question arises whether there are specific factors prompting the decision-maker to use intuition in the decision-making process. In the literature, these issues are still little explored, contributing to the emergence of research gaps. Few authors have attempted to identify the determinants of the use of intuition in decision-making practice. The rest of the paper presents selected research results obtained in this area, in chronological order.

Two authors who have attempted to identify when and why intuition is used in decision-making processes are E. Dane and M. G. Pratt. According to them, two groups of factors determining the effective use of intuition can be distinguished: those related to the field of knowledge the decision concerns, and those related to the features of the decision problem (Dane & Pratt 2007, p. 41).

Factors related to the field of knowledge concern certain patterns that the decision-maker uses in relation to a particular field. These schemes mean cognitive structures used to obtain information and solve a decision problem. They can be relatively simple and contain little professional knowledge (as in the case of heuristic diagrammes). They can also be more complex, like expert schemes. Heuristic schemes encourage the use of intuition by reducing the complexity of the decision problem, focusing on the most important information and projecting the optimal solution. However, these schemes are used when it is necessary to make decisions under time pressure and in conditions of uncertainty; they can therefore lead to decision errors. More and more researchers pay attention to the fact that accurate intuitive decisions can be made based on expert schemes. Expert intuition means matching patterns of action encoded by an expert to a situation and a decision problem. It is suggested that only those schemes that are complex and directly related to a decision problem can positively affect the effectiveness of using intuition in the decision-making process.

The second group of determinants is associated with the features of the decision problem. Research results show that intuition should be used in problems where there are no clear rules of action. Such problems require an ethical, political or behavioural assessment (Laughlin & Ellis 1986, pp. 177–189). In addition, intuition is used more often in relation to complex and unstructured problems. The uncertainty of the environment in which modern enterprises operate translates into an increase in complexity and a reduction in the structure of decision problems. These changes bring about the use of intuition in the decision-making

process. The relationship between the effectiveness of the organisations in conditions of uncertainty and the use of intuition in decision-making processes has been empirically confirmed (Khatri & Ng 2000, pp. 57–86).

E. Dane and M. G. Pratt take into account both internal and external factors in elaborating the determinants for using intuition in decision-making. Internal factors are those related to the decision-maker (heuristic or expert knowledge patterns), while external factors include features of the decision problem that are a consequence of the complexity and uncertainty of the environment in which modern enterprises operate. Unstructured and unique problems force the use of intuition in management practice, especially in the decision-making process.

D. Kahneman, a psychologist, and G. Klein, a management specialist, have also researched factors determining the use of intuition in decision-making practice. They have sought particularly to understand the factors determining the accuracy of intuitive choices. They elaborated three determinants (Kahneman & Klein 2009, pp. 524–525):

– expert knowledge – the decision-maker's confidence is supported by reliable knowledge;

– the nature of the environment that stimulates the effective use of intuition is one in which there are relatively constant relationships between the identified signals and events. This does not preclude uncertainty from categorising the environment;

– the ability to recognise patterns occurring in the environment – this ability results from the decision-maker's experience and the ability to obtain feedback as a basis for learning (feedback should be immediate and unambiguous). Education and the use of expert intuition is only possible in cases where the environment provides the decision-maker appropriate guidance and feedback at the same time.

E. Salas, M. A. Rosen and D. DiazGranados have also considered the determinants of the effective use of intuition in making decisions. They proposed a division into three groups (Salas, Rosen & DiazGranados 2010, pp. 941–973):

– related to the person making the decision – with particular attention paid to expert knowledge and the method of obtaining and processing information,

– related to the decision problem – the structure of the problem and the availability of feedback are the primary aspects analysed,

– related to the conditions and the decision-making situation – the main factor taken into account in this group of determinants is time pressure.

These determinants are the most comprehensive of the current proposals, bringing together all of the determinants previously proposed in the literature, and which E. Salas, M. A. Rosen and D. DiazGranados systematise in their work. The small number of factors distinguished within individual categories of deter-

minants limits this typology. It would seem reasonable to widen each group with additional factors.

B. D. Blume and J. G. Covin also contribute to the dialogue on intuition in decision-making. They maintain that the use of intuition depends primarily on the perception of intuition and the degree of its acceptance. This acceptance depends on a number of factors such as the effectiveness of previous decisions and projects, self-confidence regarding the achievement of objectives, degree of ambiguity tolerance related to the openness and flexibility of the decision-maker, the omnipotence of the decision-maker (meaning trust in his or her own judgments and opinions), or an intuitive cognitive style (Blume & Covin 2011, pp. 140–143).

These factors make the decision-maker accept intuition as the basis of the decision and refer to it by making their choices. In addition to factors affecting the acceptance and perception of intuition, B. D. Blume and J. G. Covin look at the importance of specific managerial characteristics, including (Blume & Covin 2011, pp. 143–146): manager's experience (meaning the decision-maker can recognise the pattern and automatically refer to previously tested solutions), expert knowledge (which enables one to shape knowledge patterns stored in the subconscious, enabling a quick response to problems in areas where the decision maker is a specialist), metacognitive skills (or the knowledge the individual has about his own cognitive process, thus enabling conscious assessment of progress in solving a decision problem, see: Cannon-Bowers *et al*. 1998), and emotional intelligence (meaning the ability to recognise and understand one's own and other emotions, see: Krzakiewicz & Cyfert 2013, pp. 4–8).

The determinants proposed by the authors above are of an internal character, because they relate to the decision-maker (his features, skills, abilities and predispositions). They do not include external factors, which may also determine the use of the intuitive approach in decision-making processes.

The impact of selected, individual factors on the use of intuition in making decisions may be found in the literature. One such factor is the decision-maker's personality type (Davis *et al*. 2007, pp. 279–290). Some of the six personality types distinguished by J. L. Holland (1997) predispose the decision-maker to use intuition in the decision-making process more than the others. These include the entrepreneurial and artistic type, while the practical and research types will prompt the decision-maker to make decisions rationally. Other personality types (the conventional and the social) do not clearly influence the style of decision-making. Individuals with these personality types tend to integrate the intuitive and rational approaches.

The internal factors that influence the use of intuition in decision-making processes indirectly include the style of thinking represented by the manager (one may prefer creativity and intuition over an analytical approach). The mental and

physical condition of the decision-maker also play a role. According to researchers, a positive attitude and mood combined with good physical condition positively affect the use of an intuitive approach (Ruder & Bless 2003, pp. 20–32).

The organisational culture is also an important external factor that influences the use of intuition in decision-making. Features of the organisational culture that enhance the use of intuition include a low level of pressure to avoid uncertainty and risk, as well as significant tolerance of chaos and ambiguity. However, the features of a "female" culture characterised by a predominance of emotions and feelings over rational analysis will be more consistent with the assumptions of an intuitive approach than making a rational (analytical) decision.

I have synthesised the foregoing considerations and researcher perspectives into a typology of determinants of using intuition in decision-making processes. It is presented in Table 1.

Table 1. Typology of Determinants of Intuition Used in Decision-making Processes

Internal Determinants	External Determinants	
Decision-maker	Decision problem	Environment
– expert knowledge – exeprience – metacognitive skills – abilities possessed (analytical vs creative thinking) – emotional intelligence – personality type (self-confidence, openness, tolerance of the risk, level of self-preservation instinct) – preferred style of obtaining and processing information (intuitive vs analytical) – attitude toward life (success orientation vs avoiding failure orientation – mental anf physical condition	– type and structure of the problem (complex, unique, unstructured) – the availability of feedback (feedback is necessary both in learning and the implementation of particular stages of decision-making)	– decision making conditions: variability of environment, high level of uncertainty, time pressure, excess or lack of information – organisational culture (e.g. accepting or discouraging experimentation and learning)

Source: (Malewska 2018, s. 148).

This typology has been empirically verified to formulate a hierarchy of factors. It is presented in the empirical section of the paper, along with valuations of the determinants from the perspective of the decision-making styles represented by the respondents (rational, quasi-rational, balanced, quasi-intuitive, intuitive). The question arises as to whether rational decision-makers agree with those who

make decisions based on intuition regarding the importance of individual factors for applying intuition in decision-making.

4. The Research Method Used for the Empirical Study

In order to identify the degree of intuition used in decision-making a questionnaire was designed. The part used to determine the level of intuition used in decision-making was formulated based on the description of two extreme approaches used in decision-making: rational and intuitive. The analysis and critical evaluation of the Polish and foreign literature revealed aspects of the decision-making process that were taken into account generally, so that the extent to which intuition was used in decision-making (the relation between rational analysis and intuition) could be determined. These aspects were at the same time the criteria for operationalisation and differentiation of intuition and rational analysis. They included location of the decision problem, how it is solved, the evaluation of other decision variants, approach to risk and uncertainty, use of information source, application of information processing procedures, documenting the decision process, involvement of the decision-maker in the decision process, logic of thinking, awareness in action, the ability to present the decision process. Respondents were asked to answer 12 closed questions by choosing one of the two possible answers. For each question, the choice made clearly indicated the use of one of the two approaches to making decisions: rational (analytical) or intuitive.

The research procedure was based on the cognitive theory of the continuum, according to which analytical and intuitive approaches to decision making coexist in management practice. These are two opposing approaches to making choices. In practice, there are rarely "pure" variations of these decision-making styles. Most often decision-makers represent combinations of these two ways of cognition and thinking, namely quasi-intuitive (decision-making is more intuitive than analytical), balanced (the approaches are balanced), or quasi-rational (decision-making is more analytical than intuitive).

The classification of individual decision-making methods was based on the following assumptions:

11–12 pro-intuition answers meant they used the intuitive approach,
8–10 pro-intuition answers meant using a quasi-intuitive approach,
6–7 pro-analysis/pro-intuition answers meant a balanced approach was used,
8–10 pro-analysis answers meant using a quasi-rational approach was used,
11–12 pro-analysis answers meant a rational approach was used.

In order to evaluate the significance of the determinants, the respondents were asked to say, on a scale of 1–5, to what extent the proposed factors force the use of

intuition. The scale breaks down as follows: 1 – is no influence, 2 – the factor is not very important, 3 – the factor is of average importance, 4 – the factor is important, 5 – the factor is very important factor. I assumed that the degree of difference between the individual assessments is equal, e.g. 1 and 2 or 3 and 4 are the same, thus making it possible to avarage the scores using arithmetic mean.

Of course, the use of the questionnaire in an empirical study, particularly as regards such a complex phenomenon as intuition, has its limitations. Foremost among them is that the answers obtained in this way are burdened with a certain degree of subjectivity on the part of respondents. That subjectivity may represent their opinions to a greater extent than the reality which they are supposed to be describing. In order to reduce this risk, pilot studies were carried out and the reliability of the tool was analysed by verifying its internal consistency (the questions that significantly reduced its consistency were removed).

Quantitative surveys were carried out using the CATI metod, ultimately resulting in 300 correctly completed questionnaries. The selection of the sample was random, layered and disproportionate (so that companies of different size were included). The survey was addressed to top-level managers.

5. Results of the Empirical Study – Evaluating the Determinants

Based on the respondents' opinions on the impact of individual determinants of the use of intuition in decision-making processes, it can be seen that the most significant determinants had an internal character. That is, they were directly related to the decision-maker. Expert knowledge and experience in a given area came first. The next most important determinants included awareness of one's own cognitive process (i.e. metacognitive skills) and preferred way of obtaining and processing information. Personality type and attitude to life were also recognised as key factors (Malewska 2018, pp. 217–219).

The survey results take into account the valuations made by all respondents, regardless of their decision-making style. Analysing the determinants' valuations in the light of respondents' decision-making style yields interesting conclusions. (Table 2). Due to the small number of individual groups taking into account both the way of making decisions and the assessment of individual determinants, the decision-makers representing the intuitive and quasi-intuitive style were integrated (assuming that in this case the intuitive approach is larger than those professing a rational approach). Rsespondents with rational and quasi-rational style were also integrated. Although this procedure did not allow the identification of statistically significant relationships, it did make it possible to determine a number of general trends.

Table 2. Average Assessment Scores of the Determinants of Intuition in Decision-making Processes (Taking into Account Respondents' Decision-making Style)

Determinants of Intuition Used in Decision-making Processes	Average Assessment of Respondents Representing Intuitive and Quasi-intuitive Decision-making	Average Assessment of Respondents Representing Balanced Decison-making	Average Assessment of Respondents Representing Rational and Quasi-rational Decison-making
Decision-making conditions	4.3	3.37	2.89
Organisational culture	3.38	3.02	2.70
The type and structure of the problem	4.31	3.24	3.02
Expert knowledge	3.77	3.70	3.66
Experience	4.32	3.93	3.63
Emotional intelligence	3.31	3.31	3.26
Possessed abilities	3.81	3.51	3.51
Metacognitive skills	3.86	3.51	3.51
Obtaining and processing information style	3.72	3.50	3.41
Personality type	3.86	3.53	3.42
Attitude to life	3.71	3.65	3.48
Mental and physical condition	2.31	3.45	3.20

Source: the author.

Intuitive decision-makers gave higher marks to the vast majority of the determinants. This means they believe these factors induce the use of intuition in decision-making. The lowest ratings were given by respondents representing a rational style, thus confirming the importance of determinants identified on the basis of the literature analysis.

Table 2 also shows that for some of the proposed determinants, the level of valuation is similar regardless of the decision-making style. These determinants include: expert knowledge, emotional intelligence, abilities (analytical vs creative thinking), metacognitive skills, preferred method of obtaining and processing information, personality type and attitude to life. There were discrepancies between the assessments made by intuitive, balanced and rational respondents for the following determinants:

– decision-making conditions (variability of the environment, high level of uncertainty, time pressure, excess or lack of information) – this determinant was

appreciated by intuitive respondents, who gave it an average grade of 4.3, while rational decision makers rated it at 2.89;

– organisational culture – the difference between the average rating of this determinant in the opinion of intuitive and rational respondents was 0.68;

– type and structure of the problem – intuitive decision-makers recognised this as one of the most important determinants of intuition in decision-making. This means that it enforces the most intuitive approach (the average assessment of this determinant was 4.31, while rational decision-makers gave it an average rating of 3.02);

– experience – evaluated as the most important determinant of intuition use in practice – an average rating was 4.32 (the respondents understood experience to mean that decision-makers automatically use previously acquired patterns of behaviour, which involves the use of so-called expert intuition). At 3.63, rational thinkers scored this determinant much lower;

– the mental and physical condition of the decision-maker – received the lowest scores from both groups, meaning neither believes these factor significantly affect the use of intuition in decision-making practice. Rational decision-makers gave this factor higher scores (average of 3.2) than did intuitive decision-makers (2.31).

6. Conclusion

Based on both theoretical and empirical considerations, it can be concluded that the use of intuition in decision-making practice is determined by many internal and external factors. According to decision-makers (representing all decision-making styles), the most important ones are internal. Of these, the respondents most appreciated expert knowledge, experience, metacognitive skills (understood as knowledge of their own cognitive process related to the awareness of the implementation of individual stages of problem solving), the preferred way of obtaining and processing information, personality type and attitude towards life. External determinants – those related to the type and structure of the decision problem – were appreciated less.

Intuitive decision-makers awarded higher scores for the vast majority of determinants than other respondents. The lowest ratings were assigned by respondents representing a rational approach. With most of the internal determinants, the valuations of decision-makers representing different decision-making styles were similar. The exception was experience, which was especially appreciated by intuitive decision-makers. On the other hand, differences in valuations are visible in relation to external determinants, which were appreciated by intuitive decision-makers. They gave the highest average rating (at the level of 4.3) to two

external determinants: environmental conditions and the type and structure of the decision problem. In their opinion, conditions such as time pressure, volatility and uncertainty or information overload require more intuition than does rational analysis. Also, the type and structure of the problem may result in the use of intuition in making decisions. In the case of individual, unique, unstructured problems, for which there are no previous precedents, decision-makers will use intuition, especially of a creative nature.

Finally, the hierarchy of determinants of using intuition in decision-making processes is shaped differently depending on the style of decision-making represented by the respondents. In the case of representatives of all decision-making styles, only those determinants related to the decision-maker (internal) were considered crucial. For intuitive decision-makers, the factors determining the use of intuition in decision-making practice are, with the exception of experience, primarily external. To wit, environmental conditions and the type and structure of the decision problem, which received the highest notes.

The issue of intuition in management, particulary in decision-making, remains unexplored. However, identifying the impact of intuition on the effectiveness of decision-making poses a fine cognitive challenge. It would be necessary to identify factors that determine this effectiveness first, while also requiring more extensive qualitative research (probably in the form of experiments).

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Determinanty wykorzystania intuicji w procesach podejmowania decyzji – wyniki badań empirycznych
(Streszczenie)

Cel: Celem artykułu jest identyfikacja determinant wykorzystania intuicji w procesach podejmowania decyzji przez menedżerów najwyższego szczebla.
Metodyka badań: Metoda ankietowa (dobór próby: losowy, warstwowy nieproporcjonalny; metoda zbierania danych: CATI; liczebność próby: 300 wypełnionych ankiet).
Wyniki badań: Rezultatem przeprowadzonych badań jest typologia determinant wykorzystania intuicji w procesach podejmowania decyzji oraz propozycje ich hierarchii.
Wnioski: Hierarchia determinant kształtuje się odmiennie w zależności od sposobu podejmowania decyzji reprezentowanego przez ankietowanych. W przypadku wyceny dokonywanej przez respondentów będących przedstawicielami wszystkich stylów decyzyjnych za kluczowe determinanty uznano wyłącznie te o charakterze wewnętrznym. Natomiast w opinii decydentów intuicyjnych czynnikami decydującymi o wykorzystaniu intuicji w praktyce podejmowania decyzji były przede wszystkim, oprócz doświadczenia, czynniki zewnętrzne: warunki otoczenia oraz rodzaj i struktura problemu decyzyjnego.
Wkład w rozwój dyscypliny: zidentyfikowanie i empiryczna weryfikacja autorskiej typologii determinant wykorzystania intuicji w procesach podejmowania decyzji.

Słowa kluczowe: intuicja, podejmowanie decyzji, determinanty procesu decyzyjnego, racjonalność.