

# Explaining the concept of abductive reasoning and its capacities and applications in psychological studies and counseling

Golara. Shariatzadeh Jonidi<sup>1\*</sup>, Amin. Afshin<sup>2</sup>

<sup>1</sup> P.h.D student of Counseling Department, Ares International Campus of Tehran University, Tehran, Iran

<sup>2</sup> M.A of Family Counseling, Allameh Tabataba'i University, Tehran, Iran

\* Corresponding author email address: g.shariatzadeh@gmail.com

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## ABSTRACT

**Objective:** abductive reasoning is one of the methods of reasoning that, despite the fact that it has been criticized by many scientists and philosophers, today some consider its application useful in research. The purpose of this research was to explain the concept of abductive reasoning and its capacities and applications in psychological studies and counseling.

**Method:** The current research is a review and descriptive-analytical research article. Articles and books related to the application of abductive reasoning in research, especially psychology and counseling research, which were extracted from the databases of reliable scientific-research articles, were used.

**Results:** A review of relevant sources shows that this method of reasoning can be a strong method for guessing scientific hypotheses.

**Conclusion:** The use of abductive reasoning in making assumptions and conclusions for guesses can give more power to the conclusions, and if combined with the current common scientific methods, it can increase the power of explaining theories and conclusions.

**Keywords:** *Abductive reasoning, Research method, Psychological studies and counseling, psychology, Counselling.*

## 1. Introduction

Pierce first mentioned *abductive reasoning* in 1866 and called it "reasoning by hypothesis" and believed that "all ideas in science are derived by abduction". He described this form of inference as a conclusion and verdict on a case or hypothesis and illustrated it with an example: Sentence: All the beans in this bag are white. Result: These beans are

white. Case or Hypothesis: These beans are from this bag. Kapitan (1997) formulated his example as follows: everything that is B is C. This A is a C. As a result, A is a B (Plutynski, 2011). The basic pattern of abduction can be considered as the ability to assume a fact A, if A is a possible explanation to explain another fact such as B. From a logical point of view, this means an invalid inference that concludes A from  $A \rightarrow B$  and B (Torasso et al., 1995). Abductive

reasoning is the opposite to *deductive* (whole-to-part) and *inductive reasoning* (part-to-whole). They are, respectively: inference from the sentence and case to the conclusion (everything that is B is C; A is a B; therefore, A is a C) or (A is a C; A is a B; therefore, everything that is B is C) (Plutynski, 2011).

In fact, abductive reasoning is a form of guessing, and its other name is inferring the best explanation, which means stating the causes and factors of the occurrence of that phenomenon so that its occurrence is justified. This type of reasoning is one of the non-mandatory types of reasoning, that is, having premises does not make having the result necessary (Ladyman, 2001).

In the humanities and social sciences studies, Norman Blaikie (2000) mentions four research strategies to answer the questions: inductive, deductive, *retroductive* and abductive reasonings. The inductive strategy starts with data collection, followed by its analysis and then their generalization, which becomes a statement with the next experiment. The deductive strategy works on the opposite of induction and its starting point is an observation that needs explanation. A temporary theory is accepted or constructed as an experiment; Then the inference is made and the hypothesis is tested by collecting appropriate data. The retroductive strategy starts from observation and proceeds by building a hypothetical model of a structure or mechanism that may be the cause of this rule, and after that, an explanation is undertaken by observing and testing to prove this structure or mechanism. Finally, the abductive strategy, which is the main concept of this research, at the beginning tries to discover the knowledge and introduction that the researchers used in the production, reproduction and interpretation of the researched phenomena through common language. These interpretations are redefined and may be turned into a data-oriented explanation. This strategy contains epistemological assumptions that are fundamentally different from the ontological assumptions of inductive and deductive strategies (Blaikie, 2000).

Abductive analysis involves an iterative process of bivariate fitting theories and data. An abductive reasoning involves making an initial guess based on the interaction between existing theories and data when anomalies or unexpected findings occur. If existing theories fully explain the phenomena of experience, the researcher can simply confirm it (Timmermans & Tavory, 2012). Anomalies are inevitable, both empirical and theoretical, and require the development of new experimental theories based on inductive conceptualization of data through intensive coding

and other methodological steps. Thus, there is a recursive sequence of possible abductive reasoning in which components are shown to no longer fit (Agar, 2006). Abductive analysis should be understood in two complementary ways. First, sharing research among the research community stimulates the expression and modification of the theoretical structure, and it is important in the process of creating and developing theories of researchers' collaboration; While the existence of agreement between them is not necessary. Second, abductive analysis initiates both forms of inductive and deductive reasoning that may be repeated as new unusual or anomalous findings emerge. Here, induction seeks to confirm generalizations, patterns, outliers, and salient themes in the data; While inference suggests a re-analysis of existing data or new rounds of data collection (Timmermans & Tavory, 2012).

Most psychologists have been taught that inductive and deductive reasoning are the two main types of reasoning used in scientific research. Another type of reasoning, abductive reasoning, is usually ignored. A serious limitation that this has created is that it has led to a failure to acknowledge the importance of explanatory reasoning in science, which abductive reasoning can contribute to (Haig, 2008).

The application of abductive reasoning has been addressed very few in research, especially in psychological research and counseling. According to the contents that have been stated, the present research was conducted with the aim of explaining the concept of abductive reasoning and its capacities and applications in psychological studies and counseling.

## 2. Method

The research method is a review type and it is descriptive-analytical research. The statistical population of the current research is all the books and articles available in reliable scientific databases that have been published about the method of abductive reasoning in analysis. Also, these articles should deal with the topic of abductive reasoning in research and preferably in the field of psychological research methods. Therefore, after searching for related keywords, 6 scientific-research articles and one book were found on this topic, which was used in this research for analysis and conclusions.

### 3. Literature Review

Abductive reasoning can have many forms in studies. When this type of strategy is used in research for theorizing, hypotheses are part of the continuous process of data collection and analysis, observation, reflection and thinking, hypothesis generation, and hypothesis testing. However, proponents of this type of argument usually believe that research should start from something other than a hypothesis (Blaikie, 2000). In abductive reasoning, theory and research are intertwined, and data and theoretical concepts go hand in hand in a formative and creative process. Regular sequences are discovered in the beginning with the flow of research and encourage the researcher to ask questions and search for answers. Research is a dialogue between data and theory in which the researcher is the mediator or translator of this dialogue. Data are interpreted and reinterpreted in the light of a developing theory. If a satisfactory explanation is achieved with theoretical saturation and convincing answers are given to the questions, it can be stopped and the reasoning process ended (Blaikie, 2000).

In psychology studies, little attention has been paid to qualitative research methods compared to other disciplines. Nevertheless, these methods have attracted psychologists' attention today, so they use many qualitative approaches and techniques in their research. Although qualitative methods are increasing and becoming more diverse and complex, psychologists usually use the inductive method in qualitative research, the purpose of which is to reason from the data to develop concepts and theories, which is often associated with data-based theory (Haplin & Richard, 2021). On the other hand, since research in the discipline of psychology mostly involves quantitative research conducted through deductive reasoning and experimental designs, qualitative research in psychology faces unique dynamics (Schiff, 2018). In light of these dynamics, we aim to establish a strong position for analysis with abductive reasoning by showing how qualitative data can challenge old and established psychological theories that are mainly applied in quantitative and comparative contexts (Haplin & Richard, 2021). In this regard, Haplin and Richard (2021) showed how abductive reasoning has been similarly employed in sociological studies (Haplin & Richard, 2021).

Analysis through abductive reasoning is a qualitative data analysis approach that aims to generate creative and original theoretical ideas through a dialectic of accumulated theoretical sensitivity and methodological discoveries (Timmermans & Tavory, 2012). This method of reasoning

in research emphasizes that instead of discarding all predetermined theoretical ideas during the research project, researchers should enter the field with the deepest and widest possible theoretical base and develop their set of theories during the research process. Theoretical communication is not limited to deduction but flourishes with theoretical writings near and far that inspire novel insights. Indeed, new concepts are developed through an abductive approach rather than theories emerging from data to explain confusing and ambiguous empirical material (Timmermans & Tavory, 2012).

March (1967) suggests that abductive reasoning, which he called "constructive reasoning," is a key method in research design. He also points to the confusion and misunderstanding caused by the lack of distinction between scientific hypotheses and plans, as well as between logical propositions and proposed plans. March (1967) states that while science aims to establish general laws, research design is related to the realization of a specific result. The pattern based on abductive reasoning that Marsh proposes is a sketch of the specific features we seek based on our prior knowledge and probabilistic models. He presents a three-step process cycle in designing research designs that is similar to Peirce's original theory of abductive reasoning. Therefore, March (1967) believes that rational design has three tasks: making a novel composition as a result of abductive reasoning; predicting features based on deductive reasoning; Summarizing common concepts and established values through induction (March, 1976).

Takeda (1994) presents a cognitive model of the research design process, which consists of five steps: 1) problem identification by comparing the design topic with the required technical specifications; 2) suggesting key concepts for solving problems; 3) developing possible solutions using key concepts and design knowledge; 4) evaluation to confirm or reject the proposed solutions; 5) drawing conclusions and deciding which solutions to choose (Takeda, 1994). The proposed plan uses the abductive reasoning method in the second step.

Also, Kramer-Peterson and Ahmad (2015) outlined an empirical approach to abductive research. In this regard, they defined abduction as the use of existing principles, laws, and theories to propose a causal explanation and search for aspects of idea generation through analysis. Hence, they found that abductive reasoning leads to constructing and paying more radical ideas and hypotheses (Koskela, Paavola, & Kroll, 2018).

Abductive reasoning provides a tool for qualitative psychologists to further exploit the potential of qualitative data by using the data to inform, refine, and expand the field's core theories (Haplin & Richard, 2021). In other words, this tool causes hypotheses to be concluded and constructed through a reasoning-based process instead of being presented intuitively (Jacobs, 2009). In fact, abductive reasoning is a type of reasoning that has both the ability to generate and evaluate hypotheses and explanatory theories (Haig, 2008).

#### 4. Discussion and Conclusion

This study aimed to explain the concept of abductive reasoning and its capacities and applications in psychological studies and counseling. Therefore, first, the concept of abductive reasoning and its difference from other types of reasoning were discussed, and the characteristics of abductive reasoning were briefly described. Then the use of this type of reasoning and its application in psychological studies were discussed.

Peirce's emphasis in formulating abductive reasoning was on hypothesis building (Torasso et al., 1995). Although the correctness or falsity of a hypothesis is determined through deductive or inductive reasoning, but more important is the process of making the hypothesis itself, which does not happen automatically. Therefore, Peirce believes there must be a reason behind the conjecture made through abductive reasoning, and for him this required rational control of this process by the scientist (Roth, 1988).

Abductive reasoning builds a bridge between qualitative and quantitative psychology by emphasizing the connection of data to theory. The abductive method and other qualitative methods can play a fundamental role in psychological science by modifying and expanding theories usually limited to quantitative research (Haplin & Richard, 2021). The appeal of analysis through abductive reasoning in research is that it provokes theoretical innovations precisely through double engagement with existing theories and rigorous methodological steps (Timmermans & Tavory, 2012). Like other qualitative approaches, the abductive method begins with data and reduces the limiting influence of established

theoretical background assumptions. However, the abductive method also encourages researchers to relate new findings to theory. As a result, the abductive method facilitates conceptual generalizability and demonstrates the application of qualitative insights and helps the findings remain prominent for the wider academic community (Haplin & Richard, 2021).

Abductive reasoning is an ideal means of bridging quantitative and qualitative psychological research. While qualitative findings are important in their own right, the abductive method can facilitate interaction across methodological gaps. For example, quantitative or qualitative researchers can reexamine the findings of an article using an experimental design or in-depth interviews. In this regard, abductive analysis also emphasizes the collaborative aspect of research, regardless of the mode of reasoning (Haplin & Richard, 2021), which can help further develop theories and findings.

#### 5. Suggestions and Applications

The importance of the concepts extracted through abductive reasoning is its application in the methodology of psychological research and counseling can lead to the emergence of new hypotheses and ideas due to its originality. In other words, applying the abductive approach can provide new meanings and models for discussion and explanation (Koskela, Paavola, & Kroll, 2018).

Therefore, using abductive reasoning in psychological research and counseling is not only a positive thing for the development of science; Rather, it seems necessary. Therefore, it is suggested to use this method of reasoning in the following cases and pay more attention to it: generation and evaluation of hypotheses, generation and evaluation of theories, and design and implementation of research methods. It is also suggested to consider the abductive method as a step between the qualitative and quantitative research stages in qualitative-quantitative studies.

#### Declaration of Interest

The authors of this article declared no conflict of interest.

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