## **Japan Journal of Research**



#### Correspondence

Wei Zhang

Institute of Legal Psychology, Guangzhou College of Commerce, Guangzhou, China

E-mail: aven.zhang@foxmail.com

· Received Date: 09 Nov 2023

· Accepted Date: 14 Nov 2023

• Publication Date: 16 Nov 2023

### Keywords

legal psychology, academic history, characteristic rule of law, artificial intelligence

#### Copyright

© 2023 Authors. This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International license.

## The Reform of Rule of Law with China Characteristics: The China Path of Legal Psychology -Towards the Development of "Holism" and "Integrationism"

### Wei Zhang, Ai Ma, Jiaying Zhai, Daisi Shen, Liang Zhao

<sup>1</sup>Institute of Legal Psychology, Guangzhou College of Commerce, Guangzhou, 510000 - China <sup>2</sup>Criminal Justice College of China University of Political Science and Law, Beijing, 100000 - China <sup>3</sup>Law school of Guangzhou College of Commerce, Guangzhou, 510000 - China

#### **Abstract**

Since the founding of the People's Republic of China 70 years ago, Chinese legal psychology has moved from "instrumentalism" to "holism" in problem consciousness and from "scientism" to "integrationism" in knowledge resources, thus providing theoretical support and knowledge resources for the construction of a country ruled by law in China. In the future development, will draw on the problem consciousness directly from the research of contemporary Chinese historical sociology, and draw on the knowledge resources indirectly from the research of sociological life course and life history. Learning from the research paradigm in the field of contemporary general artificial intelligence and advanced tools in the field of contemporary special artificial intelligence can further promote the development of Chinese legal psychology and provide more theoretical support and knowledge resources for the construction of a country ruled by law.

"The Central Committee of the Communist Party of China's Decision on Several Major Issues of Comprehensively Advancing the Rule of Law" puts forward: "To build a welloff society in an all-round way, realize the Chinese nation's great rejuvenation of the Chinese dream, comprehensively deepen reform, improve and develop the Socialism with Chinese characteristics system, and improve the party's ruling ability and level, we must comprehensively promote the rule of law." Since the founding of the People's Republic of China 70 years ago, the discipline of legal psychology in China has helped to realize the rule of law. On the one hand, it provides a theory and path for solving practical problems of the rule of law with its unique perspective and method, on the other hand, it provides ideological resources for the construction of the rule of law with its unique spiritual concern. China's legal psychology has moved from "instrumentalism" to "holism" in question consciousness and from "scientism" to "integrationism" in knowledge resources, thus providing theoretical support and knowledge resources for the construction of a country ruled by law in China. At present, there are few discussions on the academic development of legal psychology in China and its value to the construction of a country ruled by law, so this study will sort out the academic history of legal psychology in China based on the two clues of "holism" and "integrationism", and put forward the development path of how to further promote the contribution of legal psychology in China to the construction of a country ruled by law.

# Narrative Models of Academic History of Legal Psychology

At present, there are three narrative modes in the academic history of legal psychology in China: first, taking Luo Dahua, the main creator of China legal psychology, as a representative, the academic development process is divided into four periods by using the method of "historical staging", and the development status and achievements of each period are summarized; Secondly, represented by Yue Guoan, Ma Ai and Li An, by using the method of "school induction" divided the academic factions into "basic theory, legislative psychology, law enforcement psychology, law supervision psychology" or "investigation psychology, trial psychology, criminal reform psychology, criminal psychology", and the development process of each faction is carried out. Thirdly, taking Dai Xin as the representative (hereinafter referred to as "Dai Wen"), adopting Thomas S.Kuhn's "scientific paradigm" style, according to the "horizontal" clue of legal psychology research theme and the "vertical" clue of knowledge, to explores the academic development of western legal psychology and

Citation: Zhang W, Ma A, Zhai J, Shen D, Zhao L. The Reform of Rule of Law with China Characteristics: The China Path of Legal Psychology-Towards the Development of "Holism" and "Integrationism". Japan J Res. 2023;4(8):1-5.

reflects on the development of legal psychology in China.

The above-mentioned first mode belongs to the writing method of "technical historical staging", which includes two staging methods, namely "technical staging" and "theoretical staging". Technical staging refers to staging "based on the natural stage characteristics of the described historical process in order to clarify the specific historical process" and "an objective and obvious organization mode based on historical facts", which is "a stable working mode in historical compilation". Technical historical staging can clearly map out the occurrence process of historical events, but it is difficult to see the future development direction of the discipline.

The above-mentioned second "school induction" mode imitates the tool manual writing of western disciplines, which can clearly sort out the important themes and representative theories of the discipline. Because of its strong color of reference books and catalogue indexes, it is difficult to indicate the future development direction of the whole discipline.

The above-mentioned third "scientific paradigm" model comes from Kuhn's exposition that "some works have secretly stipulated a reasonable problem and method in the research field for later generations of practitioners in a certain period of time", which is the definition of "scientific paradigm". According to the definition of "paradigm", the narrative mode of scientific paradigm includes two levels: "problem" and "method". As far as Dai Wen is concerned, several themes of western legal psychology are summarized at the "problem" level, and the characteristics of the knowledge structure formed by the combination of law and psychology at the "method" level.

The model of "scientific paradigm" can clearly clarify the relationship between the past, the present and the future from the perspective of scientific evolution. However, due to Dai Wen's reflection on the development of legal psychology in China with the narrative of western legal psychology, there are two limitations:

First, western legal psychology has a strong applied discipline of instrumentalism. In the era of its prosperity and development, the western political and social systems and legal norms have been very perfect, so western legal psychology only needs to follow the research path of "jurist asks, psychologist answers". However, the recovery of legal psychology in China is in the 1980s when the rule of law was initially restored in China, so it is necessary to solve the "bright problems" and "dark problems" in the construction of a country ruled by law. Among them, the "bright problem" refers to "the governance of modern countries and social governance is first manifested in the governance of normative systems. In the construction of a country ruled by law, various normative systems should be scientifically and properly positioned, and the position, function and relationship of different normative types in the structure of social governance and rule by law should be accurately defined." Legal psychology needs to play the role of "instrumentalism" to assist the construction of legal normative systems, and the "dark problem" refers to "law is the heavy weapon of governing the country. The authority of law comes from people's inner support and sincere belief ",and" the government's power and control system must be justified to make people accept it voluntarily and maintain it for a long time ",that is," what kind of law is a good law, which is a legitimate and reasonable law ",that is, the legitimacy of China's legal norm system. In addition, China's traditional culture is completely different from that of the west, and the source of the legitimacy of law is also completely different from that of the west, which takes "right" as the starting point and "formalism rationality" as the reasoning rule. Therefore, it is difficult to directly respond to these two local problems with China characteristics simply by reviewing the history of western legal psychology.

Secondly, at the "method" level of scientific paradigm, Dai Wen mainly discusses the knowledge exchange between law and psychology. Legal psychology should pay attention to the development of psychology itself in addition to the relationship between law and psychology, but Dai Wen lacks discussion on this content. Koch (S.) once put forward that "psychology can't be an integrated science", and Thomas Hardy Leahey once put forward that "psychology is a science full of crisis, and this crisis will always accompany the development of psychology", and the crisis of psychology is mainly manifested in the "disciplinary split" crisis of "the confrontation between scientific psychology and humanistic psychology" caused by "the tension between purpose and method". Then, what impact will the crisis of discipline division of psychology have on the development of legal psychology in China?

Therefore, in order to make clear how China's legal psychology has contributed to the construction of a country ruled by law in China since its establishment and how it should be further developed in the future, this paper describes the development trend and academic contribution of China's legal psychology towards "holism" and "integrationism" with reference to the "problems" and "methods" of the "scientific paradigm" model, and puts forward the future development direction of China's legal psychology facing the construction of a country ruled by law.

# China's Legal Psychology Towards Holism and Integrationism

This paper mainly discusses the development trend of China's legal psychology towards "holism" from the perspective of "problems" and the necessity of China's legal psychology towards "integrationism" from the perspective of "methods" knowledge resources. In the part of "Problems", the theoretical basis, turning point and two important development trends of China's legal psychology towards "holism" are discussed. In the "method" part, the trend and potential problems of legal psychology knowledge resources moving towards scientific psychology after 1990s are discussed, and the necessity of moving towards "integrationism" of knowledge resources is analyzed.

# Problem consciousness: from "instrumentalism" to "holism"

Since the founding of the People's Republic of China, China's legal psychology has gradually expanded from "instrumentalism" which focuses on responding to the problems in the practice of rule of law construction and policy orientation to "holism" which focuses on responding to the coexistence of ideological legitimacy and practical problems in the construction of a country ruled by law. The following mainly reviews the theoretical basis, turning point and two trends towards "holism" of China's legal psychology in its creation period.

Firstly, it is the theoretical basis of China's legal psychology. After a short pause of 30 years in the early days of the founding of the People's Republic of China, China's legal psychology began to establish a disciplinary framework with criminal psychology as the guide after 1979. Document No.58 issued by the Central Committee of the Communist Party of China

in 1979 mentioned that "due to the change of class relations, the view of class struggle as the key link' cannot be followed in treating juvenile delinquency, and it needs to be explained from the age characteristics, psychological and social factors of teenagers". In order to respond to this practical problem, China's legal psychology took juvenile criminal psychology as the breakthrough point, and established the first batch of theoretical achievements led by criminal psychology, the representative of which was "criminal psychological structure" theory. The "criminal psychological structure" theory has the following characteristics: firstly, guided by system theory, it covers the core concepts of cognitive psychology, emotional psychology and personality psychology in theoretical schools, and covers short-term psychological state, personality characteristics and development factors in time scale, so it is an open theoretical structure; Secondly, "criminal psychological structure" theory is an "ideal type of dichotomy" that divides people into criminals and non-criminals. At the same time, it echoes the ideological trend of "Farewell to Revolution" in the 1980s, and turns the revolutionary ideology with the subjective thought of "revolution and counter-revolution" into an objective type with the characteristics of psychological behavior as the standard, which provides an important resource for ideological transformation for the construction of a country ruled by law. The open structure of the "criminal psychological structure" theory and the objective "ideal type of dichotomy" laid a good foundation for the subsequent development of legal psychology in China.

Secondly, it is a turning point in the development of legal psychology in China. From 1980s to 1990s, Ma Ai further put forward the "criminal choice" theory based on the "criminal psychological structure" theory. The "criminal choice" theory includes two levels. The first level can be regarded as a continuation of the "criminal psychological structure" theory, and the second level is a breakthrough in the "criminal psychological structure" theory, which brings an opportunity for China to turn his consciousness of legal psychology. The first layer of the "criminal choice" theory refers to "what kind of response method is adopted under the state of internal and external stimuli, which is not simply determined by the content, intensity and mode of stimulus variables, but is more subject to the intermediary role of personality structure, cognitive structure processing, tradeoff and so on in individual psychology", emphasizing all the factors covered in the "criminal psychological structure" theory; The second layer refers to "committing a crime is a selective behavior of the criminal subject, and any individual behavior is initiated by motivation, and the way for human beings to calm motivation, meet needs or suppress needs is never unique, but can be chosen." The second layer emphasizes the situational and randomness of the criminal subject's criminal behavior and the environmental decisiveness of the means of realization, and leads the problem consciousness to external factors such as institutional culture, political and social environment.

Finally, there are two trends of China's legal psychology towards "holism" after entering the 21st century. Firstly, the study of relative deprivation was initiated. The representative is that Ma Ai extended the theoretical concern of criminal choice theory to social system and environment, and conducted a social survey-style study of relative deprivation and coping style, which completely described the whole process from social system shaping people's subjective perception to people's subjective perception influencing behavior choice, and examined the influence of China's social distribution system on

China people's ideology and behavior pattern from a theoretical perspective. The second is the opening of the research on judicial cognitive mechanism, which is represented by Li An's research on the "dual cognitive processing mechanism of intuition and rationality" of judges in judicial adjudication from the perspective of cognitive psychology. The first research trend means that China's legal psychology has gradually turned from solving specific problems in the construction of a country ruled by law and responding to realistic policy requirements to facing the fundamental problem of system legitimacy. The second research trend means that China's legal psychology has gradually started to study based on the premise that the legal system and judicial practice are beyond doubt, and has begun to reflect on and examine the problems in the operation mechanism of the judicial system from a psychological perspective. These two representative trends mean that China's legal psychology's problem consciousness has begun to expand and gradually moved from "instrumentalism" to "holism".

### Knowledge Resources: From Scientism to Integrationism

Legal psychology takes psychology as its knowledge resource. The main crisis faced by contemporary psychology is the double-peak confrontation between "problem-centered" humanistic psychology and "method-centered" scientific psychology. Scientific psychology is increasingly becoming the mainstream of psychology, which will have two influences on China's legal psychology. Starting with the philosophical hypothesis of scientific psychology, the following analyzes these two influences and discusses the necessity of the development of China's legal psychology knowledge resources towards "integrationism".

Koch (S.) mentioned: "Scientific psychology is based on a concept, and natural science can complete the speculative research on human beings", while the philosophical hypothesis of scientific psychology follows Karl Popper's "logical positivism", and the research paradigm is mainly embodied in "operationalism" and "falsification standard". In 1935, Stevens (S.S.)'s "Operational Definition of Psychological Concepts" published, which made human subjective experience concrete and empirical under the guidance of logical positivism, thus forming the "operationalism" of psychology. Karl popper challenged the traditional inductive positivism, established the connection between "observation proposition" and "theoretical proposition", and put forward that scientific theory should be a theory that "logically exists the possibility of being falsified by experience", thus establishing the "falsification standard" of scientific research. The philosophical basis of "operationalism" is American pragmatism philosophy. The typical feature of pragmatism philosophy is that it only pays attention to the direct phenomenon itself and the solution of specific problems, and rarely reflects on the social structure, system and macro situation behind the phenomenon, makes "operationalism" based on pragmatism "push essentialism into the hostile camp", and excludes many concepts that cannot be operated from the research scope. "Falsification standard" stimulates the enthusiasm of academic circles for the research and application of new observation tools. By developing and applying new tools, the scope of empirical phenomena that can be observed can be expanded, thus providing more sources of empirical data for falsification.

On the one hand, scientific psychology based on "operationalism" and "falsification standard" has rapidly completed the development process from subjectivism to

"objectivism", making psychology an axiomatic science that can be tested and explain objective phenomena, but on the other hand, it has also produced two limitations:

First, the problems caused by "operationalism" can only be operated on "concepts with small extension", but it is difficult to operate on concepts with large extension. The concepts that are difficult to operate are usually not included in the research scope or even the thinking scope of scientific psychology. Giving up thinking about such extended concepts as "psychology", "consciousness" and "mind" makes psychology "lack of positive reflection on the philosophical basis of this discipline", and the innovation point of social science with China characteristics lies in "ontological innovation", which forms the problem of "paying attention to national ideological identity" and "legitimacy". In form, it has a theoretical system of "independent ontological propositions", "complete combination of propositions in a specific field", "diversified ontological system" and "capable of explaining the differentiated structure among social phenomena". Scientific psychology lacking the ability to reflect ontological problems is difficult to respond to China's local social problems and establish a theoretical system with local characteristics.

Secondly, the research and development and application of new tools guided by "falsification standard" promote the discovery of new phenomena and new experiences and provide more experience resources for falsification. On the other hand, academic research relies more and more on collecting new phenomena through tools and theoretical explanation depends on new concepts based on new tools, which makes contemporary psychology invisibly abandon the direct concern of classical psychology on human nature and subjective experience, and more and more tend to explain human behavior with physiological factors instead of subjective psychological factors. The most typical trend is the great development of cognitive neuroscience brought about by the rise of brain science, which makes the cognitive neuroscience with fMRI and ERP as research tools and brain network analysis and brain functional area analysis as the mainstream rapidly abandoned many classic psychological theories based on speculation and theoretical deduction. On the one hand, the development of cognitive neuroscience expands the objective phenomena that can be observed in psychological research and promotes the empirical test of traditional theories; on the other hand, it unilaterally emphasizes the physiological basis of psychology, but unexpectedly reduces psychology to physiology and replaces psychological explanation with physiological explanation, which makes psychology lose its theoretical value of responding to social problems at the human level.

The limitation of "operationalism" results in that legal psychology with scientific psychology as its knowledge resource can only be limited to the problem solving of "instrumentalism" and become "psychology in law", which is regarded as a "marginal subject" by law, and can only follow the problem consciousness of jurists and solve some specific problems in practice, without responding to fundamental big problems such as the foundation of system legitimacy and the legitimacy of ideology in the construction of a country ruled by law, which hinders China's legal psychology from moving towards "holism" at the problem level. The limitation of "falsification standard" makes psychology lose the direct concern for human nature in the classical era, and makes scientific psychology, which relies on the development of new tools, lack the response

to the complex human nature problems caused by the rapid transformation of China society from tradition to modernity. Therefore, it has become an important academic development direction for China's knowledge resources of legal psychology to move towards the "integrationism" of humanistic psychology and scientific psychology. Then, how to the "integrationism" at knowledge resources level? The study will explore two new possibilities in the next section.

### Two new possibilities for "holism" and "integrationism"

To sum up, the general trend of the development of legal psychology in China in the 70 years since the founding of the People's Republic of China is as follows: gradually expanding the problem consciousness at the problem level, moving towards "holism" and focusing on scientific psychology at the level of knowledge resources, and further moving towards the characteristics of "integrationism" between science and humanities. In order to further promote China's legal psychology to expand its scope on the problem level, face the fundamental problems of China's construction of a country ruled by law, and move towards the problem consciousness of "holism", and at the same time expand its sources in knowledge resources and move towards the theoretical basis of "integrationism", the possibility of learning from each other is discussed below.

The first possibility is to draw lessons from the problem consciousness directly from the study of contemporary historical sociology in China, and indirectly from the study of sociological life course and life history. Sociologists in China have witnessed a historical turning trend of sociological research this year, which states that historical sociology is not a new knowledge, but a return to the creative form of sociology, and "facing ideas and experiences, systems and people's feelings, history and reality at the same time", and pointing out the historical orientation at the beginning of sociology for the overall knowledge produced by the changes of many times in modern society. In recent years, China's historical sociology began to bring the issue of "revolution" back to the perspective of sociological research, "deeply understand the unique political culture established by the Communist Party of China (CPC) during the revolutionary period and its complex and far-reaching historical effects", and combined with "China's traditional civilization" and "the speculative change formed by modern China", it took "the Communist Party of China (CPC)'s shaping of new political tradition" as the leading problem consciousness of China's historical sociology. This is a typical awareness of the overall problems in China's political society. In order to respond to the overall and fundamental problems in the construction of a country ruled by law, China's legal psychology can directly draw lessons from the research results of contemporary historical sociology.

In 1990s, sociologists first introduced the "North American Paradigm" life course study represented by Elder (G.H.) into China. After the 21st century, based on the reflection of American realistic sociology, sociologists will introduce the "European Paradigm" life course study represented by Kohli (M.) into China on the basis of the North American paradigm focusing on micro-events. Compared with the North American paradigm, which focuses on micro-events, the life course study of the European paradigm pays more attention to the influence of macro-system on life choices, which is more suitable for the reality that the social system and social structure of China society are undergoing rapid transformation. From the perspective of evolution, the theory of life history, which focuses on the generation of individual's "resource allocation

strategy" in a specific environment, was introduced into China, which started the research on the influence of macrosystem, social environment and micro-living environment on individual personality traits and survival strategies. China's legal psychology indirectly draws lessons from sociology's life course and life history research: through the academic interaction between psychological biography research and the above two, it forms a psychological biography research that pays attention to the human nature with China characteristics shaped by China's political, social culture and system, and then inputs the psychological biography research results with this local spiritual concern into China's legal psychology research field as knowledge resources.

The second possibility is to learn from the research paradigm in the field of contemporary general artificial intelligence and advanced tools in the field of contemporary special artificial intelligence. On the one hand, there are two theoretical orientations and technical paths in the field of artificial intelligence. One is called "General Artificial Intelligence" (AGI), and the other is called "Special Artificial Intelligence" (SAI). The general artificial intelligence adopts the path of "think before doing", which first defines the characteristics of intelligence, and then realizes it through technology. When defining and discussing intelligence problems in advance, the research on general artificial intelligence draws on classical psychological theories, attaches importance to subjective experience and experiences, and introduces psychological perspectives into the research. Drawing lessons from this research path can effectively make up for the limitation of reducing psychological phenomena to physiological phenomena previously discussed in the knowledge resources department, and bring the classical problems and research objects of psychological research back to the basic theory of psychology. On the other hand, the legal psychology circle in China has started to learn from the advanced technology in the field of special artificial intelligence, and developed a series of advanced observation tools, such as the "non-contact real-time dynamic psychological evaluation system" selected by the China Association for Science and Technology in the "Handbook for Promoting Scientific and Technological Achievements in Frontier Fields in 2019", and various intelligent devices for interrogation and lie detection based on computer vision technology and voice recognition technology, which greatly expanded the scope of observing human subjective experience and provided a source of power for further academic development.

### References

- Luo D. Review and Prospect of China's Legal Psychological Science Research. Journal of Fujian Public Security College. 2006;4:6-13
- Zhou X. Basic Paradigm of Sociological Theory and Its Integration Possibility. Sociological Research. 2002;5:29-34
- Ma A. Discussion on basic theoretical issues of legal psychology. Journal of Gansu University of Political Science and Law. 2002;111:51-59
- Le G, Li A. Legal Psychology: An Applied Discipline to Promote Judicial Justice. Journal of China Academy of Sciences. 2012;27:119-129
- Dai X. Psychological intervention in legal research. Law and Social Sciences. 2012;2:1-49
- 6. Zhao Y. The concept of historical division and the practice of historiography. Journal of History. 2001;4:2
- 7. kuhn T. The Structure of Scientific Revolution. Beijing, Peking

- University Publishing House. 2003.
- 8. Yue G, Li A, Qun Y. Legal Psychology. Shanghai, East China Normal University Press. 2016.
- 9. Liu Z. The normative system of contemporary China. Theoretical institutional structure. China Social Sciences. 2019;7:85-108.
- Huang Z. The Origin and Trend of the Legitimacy Foundation of China's Political System. Dialogue between Chinese and Western Scholars (VII) Introduction, Open Era. 2014;5:12-20
- 11. Koch S. Psychology or Psychological Studies? American Psychologists. 1993;48.
- 12. Leahey TH. History of Psychology-the Main Trend of Psychological Thought. Shanghai □Shanghai Translation Publishing House; 1990.
- 13. Shu Y. Tension of purpose and method. Philosophical and historical roots of psychology splitting. Journal of Capital Normal University (Social Science Edition). 2018;4:160-166
- 14. Shu Y. Essence and Solution of Psychological Crisis. Psychological Science. 2018;3661510-1516.
- Luo D. Criminal Psychology. Beijing. Mass Publishing House; 2018.
- Ma A. Re-discussion on the choice of crime. China Prison Journal. 2006; 4.
- Ma A. Relative deprivation and social adaptation. Mediating effect and moderating effect. Journal of Psychology. 2006;443:377-387
- 18. Li A. Intuition in judicial process and its deviation control. China Social Sciences. 2013;5:142-161.
- Yueyu Shu, Yingbo Shi, Yan Yuan (2019). "Operation definition" and "falsification standard" are not enough to lay the foundation for psychology. Journal of Psychology, 519, 1068-1978
- Dingxin Zhao (2019). From American Pragmatism Social Science to Socialism with Chinese characteristics Social Science-Exploration on the Basis of Philosophy and Methodology. Sociological Research, 1, 17-42
- 21. Xin Z. Psychological research methods. Beijing, Beijing Normal University Press; 2017.
- Meng Q. Classical Roots and Modern Paths. Historical Sociology as an Overall Vision. Guangdong Social Sciences. 2017;6:17-42
- 23. Ying X. On the Rise of Historical Sociology in China. Xue Hai. 2018:3.
- Qu J. Returning to the historical perspective and remolding the imagination of sociology. China's recent changes and the new tradition of the study of classics and history. Society. 2015;1.
- Ying X. Bringing the Revolution Back: Expanding the New Horizon of Sociology. Society. 2015;4.
- Qiang L, Deng J. Social change and personal development. Paradigm and method of life course research. Sociological research. 1999;6:1-18.
- Zheng Z, Hu S. Institutionalization of life course. Paradigm and method of European life course research. Sociological research. 2018;2:214-246.
- 28. Lin Z, Yan W. Theory of life history. Outlook on life development from the perspective of evolution. advances in psychological science. 2015;234:721-728.
- Liu K, Long Z, Liu B, et al. Where to go? Teachers' Future and Future Teachers from the Perspective of General Artificial Intelligence. Research on Open Education. 2018;205:565-575
- 30. Liu K, Hu X, Ma Y, et al. An Outline of Artificial Intelligence in Education in China-Based on the Perspective of General Artificial Intelligence. Open Education Research. 2018;2:31-40