

On certainties and uncertainties in the studies of international relations

LI Shaojun

Institute of International Relations of Shanghai Academy of Social Sciences, Shanghai, 200020

Abstract The study of international relations is not a perfect discipline. What scholars seek is certain knowledge, but they have to deal with both many facts that are difficult to comprehend and with academic uncertainties. Because facts in international relations have societal and systemic properties, conceptual factors cannot be directly observed and the complex impacts of the systemic effects are difficult to explain, and therefore incomplete information and inference uncertainties cannot be avoided. In this regard, studies of international relations need to explain both the certainties of the relationships among the variables and the uncertainties due to the conceptual factors and the systemic complexities. The certainties can be explained by specifying the properties of specific events and the range of possible changes within the given premises and by indicating those directions and factors that require close attention. Explaining the uncertainties requires revealing the complex systemic structure due to the non-observable factors and deducing their interactions and contributions to the systemic effects. In studies in which the two cannot be separated, specific knowledge about every single mechanism as well as a deepened understanding of the uncertainties is required. With respect to the discipline of international relations, some knowledge can be inferred from the results of specific premises that cannot explain everything in international relations. Knowledge about such uncertainties is necessary for both researchers and policy makers because the international environment is uncertain and a deeper understanding is required.

Keywords certainty, uncertainty, systemic effects, rationalism, constructivism

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About the author: LI Shaojun, Special Research Fellow, Institute of International Relations of Shanghai Academy of Social Sciences.

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To study international relations, be it the description or explanation of the facts which have occurred, or prediction of what would occur, people all pursue certainty, which is to form a well-developed knowledge without any doubt. However, the reality does not seem optimistic. Although voluminous studies and recognized theoretical systems have formed, there is still uncertainty in terms of people's recognition of international relations. Interpretations for the macro trends of international interaction are different; besides, interpretation and prediction of specific events are often controversial. Take the end of the Cold War which is a typical event marking the era of transition as an example, the academia of international relations has been criticized for its failure to propose an accurate prediction, and their explanation of the reasons afterwards is unsatisfactory.^① Why is there such a situation? What is the cause of people's cognitive uncertainty? What kind of impact will this uncertainty on the international relations research? All these questions need to be discussed. This paper argues that international relations is not a perfect knowledge system; only people understand the certainty and uncertainty will they be able to have appropriate understanding of the discipline and knowledge system of the discipline.

1 Definition of certainties and uncertainties and the studies of international relations

The so-called certainty, defined from the perspective of academic research, refers to a state, that is, there is no doubt. The information and knowledge corresponding to the certainty is error-free and well-developed. In contrast, the uncertainty refers to the state with doubts and not well-developed knowledge, and even an unknown state.^② Understanding from the perspective, the two definitions refer to the researcher's cognition of the research subject, and explain the state of information and knowledge which the researcher obtains. For the researcher, the

^① See also John Lewis Gaddis, "International Relations Theory and the End of the Cold War," *International Security*, Vol. 17, No.3, 1992/1993, pp.5-58.

^② See also *Webster's Ninth New Collegiate Dictionary*, Springfield: Merriam-Webster Inc., 1991, p. 223, p. 1284.

knowledge of certainty corresponds to the knowable subject. For the subject, as long as the researcher possesses proper ways and corresponding handling capability, he or she will be able to discover through the observation, and draw correct conclusions through validation. Otherwise, the research subject or its certain aspect will be unknown to the researcher, and leads to the uncertainty of cognition and knowledge based on the cognition.

For the uncertainty, the academia (including the natural sciences, humanities and social sciences) has experienced a process of cognition evolution. British physicist F. David Peat thoroughly explained the challenges by uncertainties which all walks of life face in his work *From Certainty to Uncertainty: The Story of Science and Ideas in the Twentieth Century* in 2002. He indicated that people were convinced of the certainty of scientific research in 19th century, since Newton demonstrated that everything in universe, like a clockwork universe, moves in accordance with strict rules; thus, its process is completely predictable. Lord Kelvin, President of the UK Royal Society, asserted that we have known, at least in principle, what we can know. Quantum mechanics and relativism, however, break these mechanic cosmologies, and proves that we at most can merely form incomplete knowledge, and this circumstance might be always maintained before the scientific seeds have rooted. For example, on black holes in the universe, we cannot obtain any information. The author believed, the common chaos in nature and society indicates that human beings are congenitally limited in perceiving, predicting, and controlling their surroundings. Although this world view might not be accepted, there is no doubt that the uncertainty tremendously affects the sciences, arts, literature, philosophy, and social relations. People have started to humbly accept the uncertainty in the 21st century.^①

Natural sciences research facing uncertainty indicates that natural scientists face many research subjects which are difficult to observe and

^① See also F. David Peat, *From Certainty to Uncertainty: The Story of Science and Ideas in the Twentieth Century*, Washington, D.C.: Joseph Henry Press, 2002, esp. pp. ix-xiv. The related narratives herein refer to the publisher's introduction to the book.

interpret, or even unknowable. Of these subjects, people will, perhaps along with the progress of means of science and technology, gradually reduce cognitive uncertainty, but people might discover even more uncertainty in their research. Of course, despite these challenges, there has been a huge amount of accumulation of knowledge of certainty in the natural sciences; various disciplines have formed the recognized and systematic findings. This situation is however in sharp contrast to the discipline of international relations. If natural sciences research, on the basis of the discovery of numerous laws and theorem, is still facing uncertainty, no unanimously recognized regularities in the study of international relations have been formed since its establishment. Almost all theories formed by the academia are controversial.

Before the discipline of modern international relations incurred in 1919, many important scholars, such as Thucydides, Grotius, Hobbes and Kant, had proposed far-reaching ideas; their views, however, could not be characterized as have been able to propose the accurate interpretation of uncertainty to the international relations. After the establishment of discipline of international relations, the idealism had won dominance; the League of Nations, being established after World War I, and the implementation of the collective security system are the realistic reflections of this idea. This doctrine, however, also faces various challenges; the outbreak of World War II demonstrates that this doctrine, as a principle guiding international relations, is questionable. Edward H. Carr, in his work *The Twenty Years' Crisis, 1919–1939: an Introduction to the Study of International Relations*, criticized this trend.^① After the World War II, the ideology of realism has held a dominant position, but the collective security mode of idealism in the United Nations is remained being practiced. The persisting debate between the two ideologies shows both confrontational and collaborative interpretations of the attributes

^① Edward Carr. *The Twenty Years' Crisis (1919–1939): An Introduction to the Study of International Relations*. Qin, Y. (trans) Beijing: World Knowledge Press, 213 (2005).

of international politics were of uncertainty. In addition, the debate between the scientism and the traditionalism in the 1960s, the debate between the neo-realism and the neo-liberalism in the 1980s, the debate between the rationalism and the constructivism in the 1990s, and the debate between the positivism and the neo-positivism, as well as the debate between the neoclassical realism, the defensive realism, and the offensive realism in the 21st century have not drawn a conclusive outcome. These arguments demonstrate that from one aspect there is uncertainty in significantly crucial knowledge of the discipline of international relations; not only is there uncertainty in the interpretation of reality by important theoretical systems, but there is always the paradigm dispute in the research approaches.

For the uncertainty in the studies of international relations, international relations scholars have begun the research at least since the 1980s. In the 1990s, many scholars have given close attention to this issue.^① In the 21st century, scholars have still discussed the issue.^② It is noted that in relevant literature, although many scholars have recognized the view that international politics occurs in a generally uncertain

^① See also Thomas R. Palfrey and Howard Rosenthal, "Voter Participation and Strategic Uncertainty," *American Political Science Review*, Vol. 79, No. 1, 1985, pp. 62–78; Barry Nalebuff, "Brinkmanship and Nuclear Deterrence: The Neutrality of Escalation," *Conflict Management and Peace Science*, Vol. 9, No. 2, 1986, pp. 19–30; Robert Powell, "Nuclear Brinkmanship with Two-Sided Incomplete Information," *American Political Science Review*, Vol. 82, No. 1, 1988, pp. 155–178; James D. Morrow, "Capabilities, Uncertainty, and Resolve: A Limited Information Model of Crisis Bargaining," *American Journal of Political Science*, Vol. 33, No. 4, 1989, pp. 941–972; D. Marc Kilgour and Frank C. Zagare, "Credibility, Uncertainty and Deterrence," *American Journal of Political Science*, Vol. 35, No. 2, 1991, pp. 305–334; Keisuke Iida, "When and How Do Domestic Constraints Matter? Two-Level Games with Uncertainty," *Journal of Conflict Resolution*, Vol. 37, No. 3, 1993, pp. 403–426; Keisuke Iida, "Analytic Uncertainty and International Cooperation: Theory and Application to International Economic Policy Coordination," *International Studies Quarterly*, Vol. 37, No. 4, 1993, pp. 431–457.

^② See also David Edelstein, "Managing Uncertainty: Beliefs About Intentions and the Rise of Great Powers," *Security Studies*, Vol. 12, No. 1, 2002, pp. 1–40; Brian C. Hathbun, "Uncertain About Uncertainty: Understanding the Multiple Meaning of a Crucial Concept in International Relations Theory," *International Studies Quarterly*, Vol. 51, No. 3, 2007, pp. 533–557; Jennifer Mitzen and Randall L. Schwelleir, "Knowing the Unknown Unknowns: Misplaced Certainty and the Onset of War," *Security Studies*, Vol. 20, No. 1, 2011, Tian, Y. *International Forum* (国际论坛), (4): 62–67 (2000); Ma, J. *International Review*, (1): 52–59 (2011); Tang, S. *Journal of International Security Studies* (国际安全研究), (2): 3–41 (2014).

environment,^① they have different views on the concept, performance, and causes of uncertainty. Here, we can get an overview of the relevant studies by citing Keisuke Iida and Brian C. Rathbun's reviews.

Keisuke Iida divided the discussion of uncertainty in the academia into strategic uncertainty and analytic uncertainty. The former concept involves strategic interactions between agents, that is, the reason for agents facing uncertainty is that they understand their own intentions, interests, and power, but not the counterparts they interact with. This situation is generally defined as asymmetric information, and it is mainly used to describe the interaction in fields of international security of high politics. For example, states implementing deterrence policies or conducting arms control negotiations, will be affected by the asymmetric information. Nevertheless, as Keisuke Iida noted, the asymmetric information is not the only form of uncertainty, and there are other uncertainties in international relations, such as stochastic uncertainty, that is, the occurrence of certain events is contingent, that is to say, they may or may not occur. Also, uncertainty does not only occur in field of high politics, but might be incurred in other fields.^②

In the field of international relations, there are a number of researches on uncertainty as a result of asymmetric information, such as the uncertain of state intentions of the realism as well as that of the participants' intentions in the game studies. For this type of research, Keisuke Iida thought it mainly studies on the agent's attribute, that is, private attributes; in addition, it also focuses on the uncertainty in public domain, that is, the system's attributes. In this context, Keisuke Iida particularly discussed the uncertainty in economic field. Since the information obtained by the government related to the operation of the world economic system is not well developed, they cannot reach consensus, even if they are in complete harmony in the real world. The

^① Jennifer Mitzen and Randall L. Schweller, "Knowing the Unknown Unknowns: Misplaced Certainty and the Onset of War," *Security Studies*, Vol. 20, No. 1, 2011, p. 5.

^② Keisuke Iida, "Analytic Uncertainty and International Cooperation: Theory and Application to International Economic Policy Coordination," *International Studies Quarterly*, Vol. 37, No. 4, 1993, pp. 432-434.

situation is called model uncertainty by the economists, that is, policy makers in different countries believe in different world models, such as the Keynesian model in the world economy and the economic worldview in the monetarism. Keisuke Iida replaced model uncertainty by analytic uncertainty. Thus, he divided relevant research into two categories: the study of strategic uncertainty giving close attention to the interaction of actors, and the study of analytic uncertainty concerning with the overall system.

For these two types of uncertainties, Keisuke Iida introduced the comparisons as follows: first, in accordance with the strategic uncertainty, each agent knows its attributes, but it was not aware of other agents' attributes; in accordance with the analytic uncertainty, each agent knows itself and its counterpart, but it does not know the attributes of economic system when dealing with its counterpart. Second, in accordance with the strategic uncertainty, each agent is aware of each behavior's benefit, in circumstances that the behavior of other agents is established; in accordance with the analytic uncertainty, the economic outcomes are identified as uncertainty since they are derived from the combination of actions; as a result, even if the behavior of all agents are known, each agent is still uncertain about its own benefits. Third, in accordance to the strategic uncertainty, the signaling of the agent is either to reflect its attributes, or to pretend to have the attributes which it actually does not have; in accordance to the analytic uncertainty, the signaling of the agent attempts to make other actors ensure that its own worldview is accurate, or benefit from the "wrong" worldview which other agents insist on. Fourth, in accordance with the strategic uncertainty, learning merely stemmed from the observation on and corollary to the behavior of other agents; in accordance with the analytic uncertainty, learning also stemmed from the observation on the outcome of policy economy. Therefore, the signaling may also adopt the ways to facilitate or hinder the further progress.^①

In the academia of international relations, besides different

^① Keisuke Iida, "Analytic Uncertainty and International Cooperation: Theory and Application to International Economic Policy Coordination," pp. 434-435.

perspectives and levels for research of uncertainty, there is a distinction of paradigm. In the overview of relevant research, Rathbun analyzed different notions of uncertainty among the two pairs of schools, which are the realism and rationalism, as well as the cognitivism and constructivism.^① In these four schools, the realism and rationalism, in general, adopt an objective perspective, while the cognitivism and constructivism adopt the subjective point of view.

According to Rathbun's argument, at the level of strategic interaction, the realism and rationalism both believe that the uncertainty arises because the countries are lack of information with regard to those interactive agents' intention, interests, and power. This point of view is the same as the summary by Keisuke Iida, but Rathbun emphasized the two ideologies' different responses to the uncertainty.

The realism believes that the country's intention at presence and in the future is unknown, and it is difficult to assess the relative military capabilities; and the two sometimes change rapidly, and thus the world is uncertain and dangerous. The realism's corresponding attitude towards the uncertainty is fear. As John Mearsheimer said, the country will never be able to grasp the intentions of other countries, and it is uncertain that it will be attacked by other countries with offensive military power, even if other countries are definitely merciful for the intention is not one hundred percent predictable.^② For this reason, Mearsheimer believed that the country which concerns its survival must make the worst assumption to the intentions of the competitors.^③ For the realism, the uncertainty of intention is one of the causes of war, and it results in structural uncertainty.^④

Rathbun's overview is to integrate realism and rationalism as a pair of categories; in fact, the response of the realism to uncertainty is also a

^① Brian C. Rathbun, "Uncertain About Uncertainty: Understanding the Multiple Meanings of a Crucial Concept in International Relations Theory," pp. 533–557.

^② John J. Mearsheimer. "The False Promise of International Institutions," *International Security*, Vol. 19, No.3, 1994/1995, p. 10.

^③ John Mearsheimer. *Tragedy of Great Power Politics*, Wang, Y. & Tang, X. (trans) Shanghai: Shanghai People's Publishing House, 55 (2003).

^④ Jennifer Mitzen and Randall L. Schweller, "Knowing the Unknown Unknowns: Misplaced Certainty and the Onset of War," p. 8.

rationalism, but the rationalism includes other schools. The use of the rationalism by Rathbun herein refers to an idea originated from the microeconomic theory, that is, the political actors constrained by structure (absence of information about relevant intentions is the most crucial) will seek to maximize their benefits. The country is uncertain whether the others would stick to their negotiating objectives and trustworthiness. In the context of collaboration games, the country does not believe the others will not deceive by illusion, and deception will lead it to be deceived. Here, although the rationalism, just like the realism, concerns strategic dilemma caused by the uncertainty of intention, it is more optimistic about international cooperation. The rationalism does not fully believe that power is the final decision-maker in international relations, and it believes that the country will not draw a pessimistic conclusion on the others' intention in advance given incomplete information. Rathbun thought that the rationalism corresponds to the uncertainty by ignorance, that is, the country, to some extent, is in the dark. In the case where reliable information demonstrates that other countries have the intention and they share a common benefit, then the rational choice is to cooperate.^① By referring to Robert O. Keohane's argument, if the country does not consistently worry about other countries, it will be more sensitive to the information, and it is willing to collect the information. This helps to develop the trustworthiness of intentions of countries which it have a strategic relationship with. The response of the rationalism to the uncertainty of intention is not the same as realism which is not to advocate accumulating power, but rather to actively assess intentions.^②

Another pair of paradigms is the cognitivism and constructivism; although they adopt the subjective perspective to uncertainty, there is divergence of views for the exact origin of subjectivity problem. For the cognitivism, the objective reality is, to a large extent, independent from

^① Brian C. Rathbun, "Uncertain About Uncertainty: Understanding the Multiple Meanings of a Crucial Concept in International Relations Theory," pp. 541–542.

^② Robert O. Keohane, "Institutionalist Theory and the Realist Challenge After the Cold War," in David Baldwin, ed., *Neorealism and Neoliberalism: The Contemporary Debate*, New York: Columbia University Press, 1993, p. 276.

social behavior and interpretation. The uncertainty is the result of unclear signal the policymakers receive. Due to the complicated world and the ambiguous information, the information can only be approximately and partially understood given cognitive limitation.^① Countries and politicians who rely on a number of cognitive shortcuts to deal with complexity, will always lead to erroneous perception and negligence. In contrast to the cognitivism, constructivism believes that the subjectivity problem is not the outcome of complexity, but it is because the meaning of information depends on the agents' norms and identity. Since the agents need to be based on identity and norms so as to determine how to deal with the actions of other subjects and the others, in the social context, it is essential for them to interpret information and form relevant concepts of appropriateness. Because norms and identity are malleable and they will change with the agents' changes, the international relations are uncertain.^②

In the conclusion of the above viewpoints, we can know the different contents of uncertainty in different concepts of uncertainty. The realism is uncertain about the opponent's intention, thereby this deduces the uncertainty of its interests and change of power, and ultimately, based on fear, infer to the conclusion of political power. The rationalism is uncertain about the agent's intention as well, based on "ignorance," however, it does not make pessimistic pre-supposing, but it rather believes that the focus of collecting information may seek a rational result of collaborative benefit. The cognitivism is uncertain about the objective information, and believes that human beings' cognitive limitations may lead to misperception. The constructivism is uncertain about the agent's conceptual change reflected by norms and identity. Based on different cognitive perspective, the relevant interpretations in the academia include the uncertainty of the object (the interactive opponent, cognitive objects), and the subject (cognitive limitations, identity); the individual (other countries), and the

^① James M. Goldgeier and Philip E. Tetlock, "Psychology and International Relations Theory," *Annual Review of Political Science*, Vol. 4, 2001, pp. 67-92.

^② Brian C. Rathbun, "Uncertain About Uncertainty: Understanding the Multiple Meanings of a Crucial Concept in International Relations Theory," pp. 534-535, p. 549.

entirety (systematic structure, game outcomes). These discussions from multiple perspectives show that people have cognitive doubts on multidimensional facts in the studies of international relations. For the reason of these cognitive confusions, although the previous studies addressed the influence of uncertainty on notion and system factors, they did not propose a comprehensive analysis of international relations from the perspective of attributes. This paper argues that only interpreting the unobservability of concept factors and complex systems theoretically can we figure out the cause of uncertainty in the studies of international relations.

2 Origin of uncertainties in the studies of international relations

In the studies of international relations, the obtainment of certain information is inseparable from the observation of the facts for the description, interpretation, judgment of value and solutions and suggestions formed in the research, even if they are generated in abstract thinking, all need to be determined by empirical observation. From this perspective, if the studies of international relations can form the certain knowledge, then all the aspects of its object must be observable. Nevertheless, the societal and systemic properties of facts of international relations lead to the facts that people have to face the aspects which cannot be acknowledged.

The fact that international relations have social property, which refers that people's intentions, has a specific meaning. Not only do agents, behaviors of agents and results have such a meaning; but also some artifacts of pure materiality, such as nuclear weapons, aircraft, anti-missile system, are meaningful. These meanings are the product of human mental activity, and human mental activity is not directly observable. For the researcher, in the studies of international relations, the significance of the fact cannot be explained. In many cases, if it fails to make a proper judgment on the intention of the body, the research has no value. For mental activity of agents which can not be directly observed, the research is usually conducted with observable factors.

In accordance with the point of view in psychology, human behavior

can be divided into two categories: one is the behavior of the reaction which can be observed, that is, the overt behavior, the other is covert behavior which may not be observed, such as thinking, memory, and other internal mental activities. Because covert behavior cannot be directly observed, and therefore overt behavior which can be observed directly is used to infer. Of the reality of international relations includes these two levels as well: the overt behavior refers to all behaviors of agents which can be observed; and the covert behavior refers to the internal mental activity of agents. For the agents, their inherent mental activity is certainly expressed by overt behavior. For example, the government's strategic intention will be manifested through the behavior of foreign policy. The public will of a country will be expressed through a variety of media and public opinion. Because of the correspondence between the two subjects, researchers can deduce its intrinsic concept by the external manifestation of the facts. In fact, the research can be only conducted in this way by researchers. People adopt questionnaire for polling, and interpret the various reports issued by the government, analyze the intention of a variety of international interactions; these are researches to be conducted with regard to outward manifestation. In many cases, researchers, based on the historical observation of empirical facts, are able to make a judgment on the policy intention of actors; even though such judgments can make mistakes since the significant changes of intention of agents, the changes can be told by external phenomenon.

Of course, the way by observing the external phenomena and interpreting internal concept of the actors, results in uncertainty, because agents cannot, under any circumstances, entirely express the inner intention in an outward form. Words and actions of agents which can be observed, merely at best partly reflect their true intentions, and are likely to contain artifacts. In international interaction, it is very dangerous for the agents to completely show the bottom line. Since the interpretation of the internal concept of agents can not be tested by researchers, whether this interpretation is proper is uncertain. Some realists think the others' concept is completely unknown, which is also an interpretation. Perhaps in some cases, continuous interaction of agents will result in a process of

constant communication and truth-seeking of a notion, and may deepen mutual understanding in the process of construction of shared knowledge explained by constructivism, but in any case, the cognition of concept factors is uncertain.

For the uncertainty of concept factors, we can adopt the research of strategic culture for description. The so-called strategic culture refers to the fundamental concept of implementation of strategy of a country. This philosophy is the integration of a country or nation's interests and goals, along with the development of history, friend and enemy, as well as the convention and tradition handling the relationship with the outside world. This tradition rooted in the civil development of a country, and it has a profound social impact on participation in international interactions; in addition, this determines a country's rough strategic preferences, and this will make a country have some of the more stable strategic mode. For the studies of international relations, the strategic culture is an important factor to be explained, because behaviors of foreign policy in different countries are often influenced by different cultural traditions. The explanation from the social psychology to this cultural tradition is a need. What can be observed is the historical literature. There is millions of historical literature in a country, different people have different judgments on the selection of proper literature and the interpretation.^① Since the impact of this cultural tradition on contemporary is extremely complicated and any interpretation cannot be tested, there is always uncertainty even if people are able to reach consensus to some extent.

System properties, herein refer that the composition of international relations realities is regarded as a system comprising a number of factors. In this system, there is a complex connection and interaction between agents, between processes, and between influencing factors. The situation is not the result of any single cause, and it does not arise only a single

^① Alastair Iain Johnston, through the interpretation on the ancient Chinese book on military strategy and analysis of the Ming Dynasty's foreign relations, in the study of Chinese strategic culture, drew the conclusion of "culture of realism," that is, the ancient Chinese dynasties, in foreign relations, is inclined to the use of force, and the strategic and cultural tradition has influence to contemporary China. See also Alastair Iain Johnston, *Cultural Realism: Strategic Culture and Grand Strategy in Chinese History*, Princeton: Princeton University Press, 1995.

result. In order to achieve interests, each agent will take action based on its own goal and strategic judgment. Each party will become the basis for the actions of the other party. Since it is difficult to predict each other's intentions among the agents, the actions of each party will affect the other party, and this will change the overall environmental systems, each party in interaction may face an uncertain interactive opponent and an interactive environment. In many cases, the effects generated by the system are direct, or even indirect, delayed, and unintended.^① For researchers on international relations, even if the relevant factors have an objective property, the composition and mechanism of this complicated effect are also difficult to be observed, or even unable to be observed. For example, the Sino-US relations as a system involve a lot of interaction factors. there are more than several hundred issues in the Sino-US strategic and economic dialogue, which shows that the structure of the relationship is a complex system.^② For this system, in fact, we cannot tell all kinds of influencing factor, or the role of each factor play in the overall impact. A further complication is that these influencing factors do not play a role independently, but play a role by cooperative force after combining with other factors. This force has an attribute which single element does not have. Like chords, when more than two keys are pressed at the same time, the sound is chorus different from any single tone.^③ The formative mechanism of joint force in the system, in most cases, is difficult to acknowledge and interpret.

To further illustrate the complexity of the system, we can use the study of comprehensive national power as an example. The comprehensive

^① In terms of the system effects, see also Robert Jervis. *System Effects: the Complexity in Political and Social Life*, Li, S. (trans) Shanghai: Shanghai People's Publishing House, 3-15, 33-80 (2008). Speaking of the realistic examples, the occurrence of the "Islamic State (IS)" in some ways is an unintended result of establishment of the Iraq War by Bush.

^② There are 116 achievements obtained in the six rounds of Sino-US Strategic and Economic Dialogue, held in July 2014. See "The List of Specific Achievements of Strategic Dialogue Under the Sixth Round of Sino-US Strategic and Economic Dialogue Framework" http://news.xinliu.net.com/world/2014-07/12/c_1111579285.htm.

^③ Reuben Ablowitz, "The Theory of Emergence," *Philosophy of Science*, Vol.6, No. 1, 1939, pp.2-3., quoted from Robert Jervis. *System Effects: the Complexity in Political and social Life*, 10.

national study aims to show the power of the country is not a single factor, but a combination of multiple factors. However, since the concept of comprehensive national power can not be observed, it is impossible to obtain a verified answer. The design of ways to measure the comprehensive national power, including the components and determination of calculation methods, are based on people's own preferences and subjective judgments. Such a calculation, even if the data are objective and accurate results, cannot prove the outcome is the comprehensive national power. The fundamental cognitive disorder is that it is impossible to observe the constitution of the comprehensive national power, and it is unable to perceive the mechanism of interactions between the various elements and the formation of joint force. In this case, researchers may make uncertain assessments. In fact, researchers can draw any desired result based on the selection and weight of the changing factors of subjective intentions.

Societal and systemic attributes of international relations discussed above can be said to constitute the objective factors impacting people's perception. In fact, subjective factors also affect people's cognition. The researchers' understanding of the world is a subjective activity, and this involves the choice of information and choice of the theoretical perspective on the basis of background knowledge, and therefore under the function of a specific preference, it is possible to make different interpretations of the same facts. Especially when there are unknown factors for research objects, the situation is even harder to avoid. In many cases, the researchers' observation to the world will be affected by identity and values, and the impact is likely to affect people's judgment and cognition. Although researchers should try to be objective and neutral doing academic research according to the norm, they have subjective consciousness and are hard to completely exclude the impact of mental activities.

3 Influence of uncertainties on the studies of international relations

The facts of international relations have societal and systemic attributes, which determines that the studies of international relations cannot avoid uncertainty. We can understand this effect from the theoretical research which is the foundation of discipline. Both for the research of big theory which explains the attributes and trends of the international system, and for that of general theory which explains the realistic problem, as long as there is uncertainty in preconditions, the inference may be questionable. Here, we may briefly discuss the deduction of several major system theories.

Realism as a system theory is a group of theories. Different branches in the group have different deductive logics. The classical realism represented by Hans J. Morgenthau, the corollary premise is anarchy and human evil (self-interested). Anarchy indicates the absence of a manager above the country, and a country can only rely on self-assistance to survive. The self-interest of humanities shows that inter-state conflict is inevitable. In the context of conflict, the country must pursue power if seeking benefits, and thus the international politics is power politics.^① If the inference of classical realism is to be tenable, the international system as a prerequisite must be the status without any managers, and the country must be purely self-interested without considering the others and common international interests. However, considering the system factors and the complexity of the concept factors, we find this reasoning to have its uncertainty: although there is no world government in the international system, the international system, to some extent, plays a role in regulation of national behavior. Since the country must coexist with the others in the system, it will find common needs in the interactions, and also consider the common interests, and therefore it cannot be purely self-interested. From this perspective, the view that the international politics is power

^① The general conclusion on inference of classical realism, see Robert Jackson & Georg Sorensen. *The Theory and Method of International Relations* Wu, Y. & Song, D (trans) Tianjin: Tianjin People's Publishing House, 94-98 (2008).

politics is uncertain, because the international politics also includes other forms of interaction, and power interaction is just one of them. Only when the international system does not function, and the self-assistance and self-interest are the principles to the behavior of agents, will the international politics be power politics.

The neo-realism represented by Kenneth N. Waltz altered corollary logic of classical realism, without considering human nature anymore, but rather making inferences based on the two premises elements of international structures and the unit, which ignores the individual attributes. It believes that the structure will determine the behavior of unit, that is, the country will properly seek authority for survival and security, and thus form the cycle of balance. Neo-realism regards a country as a rational agent with different powers, and the international system as a purely objective composition and process; its purpose is to discover the objective laws through scientific inference.^① However, the realistic international system and the unit have complex constitutions, and the countries are not able, in the system, to receive a single impact. They have different intentions, so they may have different rational models. Under system effects, the formation of the balance of power system, and the time of such formation are uncertain. For this viewpoint, Waltz also pointed out that the interpretation that structure constraints behaviors and outcomes is uncertain, because unit and the structure may influence them at the same time and it is difficult to determine which one is stronger. This is a limitation of the system theory. Structural theory of international politics can determine the scope of the results, and prompt the overall trend; in addition, it can direct our attention to the type of behavior and the results of expected scope, but it is unable to predict specific results.^②

The interpretations of neoclassical realism, offensive realism and defensive realism have added preconditions. Neoclassical realism adds the impact of government on decision-making and thinks that the structure

^① Kenneth Waltz. *Theory of International Politics* Xin, Q. (trans) Shanghai: Shanghai People's Publishing House, 132–134, 154–156, 168–170 (2003).

^② See Kenneth Waltz. *Realism and International Politics* Zhang, Y. & Liu, F. (trans) Beijing: Peking University Press, 51–52 (2012).

affects the behavior of a country through the government. It considers the uncertainty of rational behavior of a country.^① In fact, the governments' judgments of the environment and considerations of the interests are different, their controls of forces are also different, and thus the response to the system pressure will also be different. Offensive realism and defensive realism add judgments of a country on security. Offensive realism takes fear as a precondition of the inference of rational behavior, that is, since the intentions of the others are completely unknown, it can only prepare for the worst taking attacks as the bottom line for policy, and as long as the great country gains hegemonic powers, they can be safe. Such inference result is the tragedy of great power politics.^② Defensive realism believes that security is not scarce, and the country's defense behavior can balance the threat and achieve security.^③ For the latter two branches, security, the subjective elements of intention, constitutes the prerequisite for interpretation. Since there is complex situation in the national security, which is unable to be observed or tested and may change, this reasoning is also uncertain.

Although the liberal institutionalism represented by Keohane and Joseph S. Nye acknowledges the premise of anarchy, it emphasizes that the mutual influence of different agents or events in the system. The starting point of the theory's corollary is complex interdependence, and it believes that due to this relationship, the position of topics of non-state agents and low politics rises, and the position of high politics declines. Because the interdependence of agents will lead to the common benefit, the cooperation will be promoted, and this will promote the development of norms and the establishment of international system.^④ In contrast with realism, liberal institutionalism makes more positive interpretation of

^① With regard to theory of neoclassical realism, see also Gideon Rose, "Neoclassical Realism and Theories of Foreign Policy," *World Politics*, Vol. 51, No. 1, 1998, pp. 144–172.

^② John Mearsheimer, *Tragedy of Great Power Politics*, 55–66.

^③ With regard to the discussion on offensive realism and defensive realism, see also Glenn H. Snyder. "Mearsheimer's World-Offensive Realism and the Struggle for Security," *International Security*, Vol. 27, No. 1, 2002, pp. 149–173.

^④ The general conclusion on liberal institutionalism, see also Robert Jackson & Georg Sorensen. *Theory and Method of International Relations*, 141–149.

rational choice of agents in anarchy, that is, it will seek cooperation rather than conflict. This inference is based primarily on the increasingly close global economic ties. In fact, there is also complex situation of interdependence in international interactions, for example, it can be divided into positive and negative situations. The power confrontation for realism is negative interdependence in terms of interactions, for example, the relationship between the United States and Soviet Union during the Cold War and that between current Israel and Palestine. Only positive interdependence, such as collective action in global governance, regional economic integration, is more likely to promote cooperation and institutionalization. In this sense, interdependence as a theoretical premise is uncertain. Only the premise is defined, namely the positive interdependence between the agents and the dominant position in the interaction, will it be able to cooperative conclusion.

In contrast to ideas of rationalism, realism and liberal institutionalism, the interpretation of constructivism is based on social facts as the logical starting point, and believes that the concept of agents rather than the material factor determines the properties of international relations. The facts that agents are enemies, friends or partners will construct a structure of different shared knowledge (culture). This shared knowledge, in turn, can construct recognition (or identities) among actors in a socialized manner.^① Since the shared concept is the fact that can not be observed and tested, it is hard to perceive the notions agents identify, the culture formed from interaction, and the social impacts of this type of culture on the actors in many cases, and people's interpretations are uncertain.

In addition to the big theoretical studies, there is uncertainty in the theoretical studies of hypothetical testing and text explanation in the discipline of international relations. We can discuss the impact of those uncertainties in these studies through the analysis of research methods of the discipline.

In the studies of international relations, the case study method is used

^① Alexander Wendt. *Social Theory of International Politics* Qin, Y. (trans) Shanghai: Shanghai People's Publishing House, 23–28 (2000).

frequently. Since the cases are selected based on a specific purpose, and they do not have objective attributes representing the whole, it is significantly uncertain to use them for the confirmation of universal proposition. People can usually conduct a single case study, and draw an appropriate explanation; they can discover new relationships among variables through the analysis of cases, and propose new hypotheses; the case can also be used as a counter-example to falsify a proposition. However, given the complexity of international relations, it may also have uncertainty for falsification with case analysis: given the effect of system, since there are complex and diverse relationships among the variables, which is not a single causal or relevant relationship, it is unable to prove that the original proposition is simply wrong even if counter-examples are found.

In contrast with case studies, quantitative method is carried out based on a large amount of sampling of facts, which is usually considered to be able to test the proposition of universal significance. The prerequisite of the method is to obtain high-quality data, and the statistical facts must be homogeneous as a whole. However, limited by the fact that the complexity of international relations, the available number of research subjects of large sample is very limited. In actual operation, the researcher is only concerned about a small number of variables and ignores other elements, and assumes the other conditions remain the same. However, the difference of facts is inevitable. Given the fact that the international relations cannot be repeated, together with the consistently changing international environment, the facts always occurring in different environments and each actor having specifically objective attributes and subjective demands; therefore there are still differences in similar cases. Even the fact has a same attribute, but at the same time it may have more different attributes. This complexity of the fact, on one hand, leads to the difficulty in variables control for the ignored factors may have different effects on different processes; on the other hand, it leads researchers have difficulty to determine the interaction mechanism between the variables by observation, because the process of international relations may be complex results caused by complicated reasons. If the real reason is the

result of a variety of factors, and different processes are influenced by different reasons, then it is unable to determine a factor is the main reason for the result despite the high probability of its occurrence.

In the quantitative studies, the correlation reflected by probabilities obtained by researchers through data processing is uncertain. More importantly, researchers are difficult to explain why such a correlation occurs for the complexity of the relationship among the variables. In fact, the most important step of quantitative research is not the data processing, but the interpretation of the relationships among variables.^① If researches fail to interpret the relationship among the variables, the mathematical calculation will make no sense. Furthermore, since in the quantitative studies, people completely ignore the impact of subjective factors of agents, and regard the relationship among the variables fully objective process to calculate, and thus the societal attributes of facts might bring the accidental uncertainty: people's ideas are not governed by objective laws; once important ideas of agents change, the objective laws which can be observed will be changed, and thus the conclusion based on objective data will be meaningless.

The research conducted with the formal method is to simplify the complicated international relations into deductive mathematical model. Such simplification can make the problem clear and the deduction rigorous and logic; however, it ignores a majority of the elements in the complex system, and thus the reasoning may be far from reality. Take the most simple game research as an example, researchers ruled out the social and psychological factors of morality, emotion and responsibility, and simplified actors into the players who share common cognition of rules

^① With regard to the interpretation of correlation and relationship between variables, see also an interesting example: a scholar found that the more consumption of the chocolate is in the country, the more there are Nobel Prize winners per capita in the country, by quantitative study. The scholar, however, has no way to explain the relationship between these two subjects, which can only explain that the chocolate may help contribute people's cognitive function. The researcher has no data of personal consumption of winners but national average. He believed that there may be an unknown reason which contributes the two subjects. The sample demonstrates that the explanation plays an essential role in data calculation. See also Franz H. Messerli, "Chocolate Consumption, Cognitive Function and Nobel Laureates," *New England Journal of Medicine*, Vol. 367, No. 16, 2002, <http://MrwW.nejm.org/t6c/nejm/367/16/>, logging time: April 20, 2015.

and gains and pursue maximum benefits and the complex diplomatic options into two choices, so as to infer every party's benefits and determine the final outcome. Since diverse influencing factors and policy options which are ignored are the facts that may exist, the actual interactive result is more complicated. Therefore, simplified interpretation can only represent one of several processes, and it is an almost impossible circumstance in reality. From this perspective, despite the strict interpretation by the formal method, its interpretation of the real interaction is uncertain.

The explanation method, studies the truth which can not be observed, that is, revealing the meaning behind it through the interpretation of the text. The significance cannot be directly observed, so the study must be interpreted through the text which can be observed, and this study has an uncertainty. For the same text, different researchers may make a different interpretation. Even interpreter reaches consensus through interactions, the interpretation cannot be determined as the most proper, because such an interpretation cannot be tested.

The above four methods for conducting the studies of international relations cannot avoid uncertainty, not because the method is not well developed, but because the fact that the content itself cannot be observed and acknowledged. Although properly using the study method can reduce the uncertainty, there is no possibility to completely overcome the cognitive limitations or to eliminate uncertainty. In this case, the results of the studies of international relations cannot avoid uncertainty. People must have an appropriate view to the studies of international relations and knowledge of international relations.

4 Conclusion

The fact that international relations have societal and systemic attributes determines the research of international relations face not only objective factors which can be observed, but also concept factors and complex system factors which cannot be observed and acknowledged. Because researchers can obtain relatively certain cognition with regard to the factors which can be observed, and uncertain cognition with regard to the

factors which cannot be observed, the studies of international relations as a whole have both of certainties and uncertainties.

One side of certainty in studies of international relations means researchers can acknowledge relationships among variables, explain the occurrence and effect of a particular mechanism, and predict the general direction of events in evolution through the observation of empirical facts. For international relations researchers, to explain the operation of a complex world, they must know which factors are the most important in order to explain certain phenomena. The essence of the study of a single or a small number of factors is to select a specific mechanism in a complex system of international relations to demonstrate. Based on the defined prerequisite, either summarizing and studying on the basis of observing a large sampling by researchers, or theoretical or abstract thinking through deduction, its purpose is to provide an explanation about the causal relationship or correlation. For such a study, only ruling out other factors by controlling the variables, and focusing on the observation of a pair of relationships, could it determine the cognition of relevant mechanism. So far, these are the ways of the research of international relations in general. ^①

However, as previously discussed, the interpretation after ruling out other factors, involves only a part of the system of international relations. Since various factors in the actual interactions cannot function solely, and all situations are virtually the result of complex reasons, assumption of the development of events with a single mechanism is uncertain. This uncertainty demonstrates that there are always a variety of possibilities in actual evolution of international relations. In order to better explain to the international relations, on the basis of certainty research of a single mechanism in international interactions, we need to study the uncertainties at the same time.

Research of uncertainties is to infer mechanism of factors which can not be observed as far as possible based on the fact that can be observed. Such studies cannot eliminate uncertainty, but they can develop the

^① John J. Mearsheimer and Stephen M. Walt, "Leaving Theory Behind: Why Simplistic Hypothesis Testing Is Bad for International Relations," *European Journal of International Relations*, Vol. 19, No. 3, 2013, p. 431.

understanding of uncertainties, and they may reduce uncertainties. For example, researchers can infer influencing factors which cannot be observed, analyze and explain the composition of its complex system, their interactions and effect, and their contribution on the system effect. The emphasis of such research is not to forecast, but rather to explain the mechanism of various factors. Since the evolution of events of international relations is changing given the effect of uncertain factors, no one can predict the future with certainty. It is fabulous for researchers to list a variety of possible changes in the evolution of international relations on the basis of the interpretation of uncertain influences.

Given the fact that international relations research has a certain side, and an uncertain side, we should also have appropriate view of the discipline of international relations. Here, the certainty of knowledge means the theory of international relations in the given premise of inferences can specify certain attributes and possible range of changes in the international situation, and let people know the direction and the factors to be concerned. This certainty will help people interpret much broader international issues. Nevertheless, since such knowledge is the inference result of a specific premise, they cannot explain all the international relations. If the conclusion of this study is considered as universal theory, it has uncertainties. Because international relations system has the complex structure and non-perceptible concepts, people are likely to find counter-examples for the interpretation by any given theory. Some debates in discipline of international relations are actually resulted from this. One is obviously only able to explain a certain type of international phenomenon, but it calls itself as the universal theory and refutes theories which explain other phenomena. This debate is pointless. For these theories, its conclusion is certain only when it corresponds with its preconditions; the explanation might be questionable once it is beyond this logic scope.

Researchers of international relations need to have a profound understanding of the impact of uncertainty so as to increase the certainty of research. To this end, the academia needs to strengthen the research on systemic factors and concept factors of international relations. If the

interpretation of a single mechanism excluding other factors is one side of the studies of international relations, study of the combined effects of various factors can constitute the other side of the studies of international relations. Explanations on both directions are necessary, and they are interrelated. In the case where people explain the certainty of a single mechanism, they need to explain the possibly complex changes besides the explanation of mechanism. Conversely, people who interpret complex changes of facts also need to base on the interpretation of a single mechanism. In this explanation, people not only can accumulate certain cognition of a variety of single mechanism, but also can consistently deepen understanding of uncertainties. The progress in the cognition of uncertainties is also the progress in the studies of international relations.

Uncertainties in the studies of international relations have are both challenges and opportunities for the discipline. Since each agent in reality needs to face a variety of uncertainties and make policy judgments, a variety of “imperfect” international relations theories are always necessary. For researchers, uncertainty represents doubts, and doubts mean a broad space of academic development in the studies of international relations. This viewpoint also reflects the value of the theoretical studies of international relations.

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