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From Certainty to Uncertainty: Parallels Between General Science and Translation Studies[1]

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Abstract

This purely conceptual study draws parallels between general science and translation studies by examining how concepts of certainty first emerged but were then abandoned as better methods for understanding phenomena became available. In doing so, we begin with the scientific zeitgeist at the turn of the 20th century, when scientific certainty was almost taken for granted. The prevailing belief in scientific certainty at that time has since been replaced by a more complex attitude toward uncertainty, one that takes into account the inherent fallibility of scientific knowledge. Our discussion of translation studies reflects a parallel development. Translation studies as an academic discipline began with the certainty of equivalence firmly rooted in Aristotelian binary logic, then discarded it and adopted uncertainty as a paradigm. We end our discussion by pointing out some theoretical traps that scholars might fall into if they take the uncertainty paradigm in translation studies at face value.

Keywords: Certainty, Complexity, Equivalence, Translation Studies, Uncertainty

1. Scientific Zeitgeist at the Turn of the 20th Century

It is hard to imagine what the world must have looked like to scientists at the turn of the 20th century. Newtonian gravity had been applied to the structure of light, Hertz's experiments had shown that electricity and magnetism were only different aspects of the same force, spontaneous generation had been definitively

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debunked by Louis Pasteur and others, and numerous new stars had been discovered in the Milky Way galaxy. Astronomers could now make detailed observations of solar activity that were no longer hampered by Earth's turbulent atmosphere. The first year of the 20th century began against this backdrop of unprecedented advances in (Newtonian) physics, electricity, biology, and astronomy.

Such was the air of certainty about our scientific accomplishment and authority that Lord Kelvin, the eminent physicist and president of the British Royal Society, proclaimed in an address with typical human hubris that there was nothing new left to discover in physics and all that remained were ever more precise measurements. All these advances and discoveries were to be put to the service of humanity and world peace, so that homelessness, "wars and international conflicts would be things of the past" (Peat, 2002, p. xi). This is the attitude of science at its height, which seems to hold that the mysteries of the universe are within the grasp of science. Coming about four decades after the publication of Darwin's *On the Origin of Species*, Kelvin's pronouncement was the height of arrogance and hubris from what was then thought to be one of the most advanced civilizations in the world. In retrospect, it is hard to imagine a cockier assessment. But time has a way of humbling the most arrogant and complacent. Time and the universe have a way of reminding us that there is more than meets the eye, and that understanding and comprehending life, the universe, and everything will always be beyond our grasp.

2. Seeds of Distrust in Scientific Certainty

As recounted by Peat (2002, pp. xi-xii), Max Planck published his first paper on quantum mechanics in 1900, a year that also saw events that sowed distrust, complexity, and uncertainty into our knowledge of the universe. Albert Einstein graduated from the Zurich Polytechnic Academy the same year; and Werner Heisenberg, who introduced the uncertainty principle in 1927, was born a year later. It is perhaps no exaggeration to say that this trio of brilliant minds has influenced science more than any other combination since the 20th century.That same year, Sigmund Freud published his *Interpretation of Dreams*, which helped launch psychoanalysis.

Although the year 1900 ushered in an age of "certainty," "stability," "peace," and "prosperity" and heralded an era in which mankind would be able to circle the earth, relax and enjoy life without fear of sickness, starvation, and war, it was anything but. The two world wars, the Great Depression, the rise of fascism, the

Holocaust, the Cold War, the Space Race, the atomic bombings of Hiroshima and Nagasaki, and, to use a term by Nassim Taleb (2017), many other "black swans" are enough to make every century a nightmare. We are now in the 21st century where the social, political, and economic landscape is vastly different from that of 1900. To say that we live in uncertain times is an understatement—from the Brexit protests and the election of Donald Trump to the emergence of a global health crisis caused by a virus whose size is measured in nanometers (Worldometers, 2022). This brief list alone might make it clear that uncertainty is an integral part of our lives today. Unpredictability permeates every aspect of our existence—from political systems to biomedical research to general business practices. In the midst of all this, we need to be flexible enough to adapt to any emerging trends and circumstances, and we must know better than to rely on certainty, predictability, and assumptions. We must be willing to try new things and learn from our successes and mistakes, even if we have personal or financial investments in old ways of knowing and seeing. The 21st century, with its problem-solving and technological prowess, has brought us back to our origins of trial and error, experimentation, and uncertainty. We need to be willing to challenge preconceived notions of the universe through trial and error and new information.

3. Parallels with Translation Studies

The historical path to the present state of affairs in translation studies bears many striking similarities to the history of science. In both cases, progress was by fits and starts and led to dead ends that are now long forgotten. The parallel is even more uncanny when we look at how the discipline began with the promise of enabling machines to deliver human-like translations. The history of machine translation is inextricably linked to the history of computational linguistics, the study of language as a computational problem. In the 1950s and 1960s, advances in the understanding of natural language processing (NLP) created great optimism that the transition from manual translation, then highly labor-intensive and error-prone, to computerized translation was imminent. Machine translation crystallized as one of the major applications of NLP, and a flurry of projects was launched. Hopes for a technical solution to the problem of machine translation grew over the years, but it was not to be. Although the performance of translation machines has improved considerably, hopes of achieving a level comparable to that of human translation have never been fulfilled. In a desperate attempt to improve on the human translation process, researchers investigated a variety of technical solutions, from

corpus linguistics (Chapelle, 2020) to the use of artificial intelligence for machine learning (Kolin, 2021; Kong, 2022). The performance of such machines is not as good as a human translator, but without question far better than anything available before. There is no question that progress will continue. The question remains: how long can humans be expected to keep up with these machines? (For recent developments in machine translation, see a recent volume by Kenny (2022).)

While it would be hard to generalize about the history of translation, it was not until the 1950s that translation started to be seriously theorized. Early translators, for example, saw language as just one more tool for passing on information from one culture to another. For centuries before the mid-20th century, there were repetitive and sterile generalizations that focused mainly on the contrast of "word-for-word" and "sense-for-sense" translation. Translators and language theorists in the 1950s and the 1960s reveled in the great advances in the field of contrastive linguistics and machine translation. It was not long, however, before their zeal was cooled by frustration with the inadequacies of their machines (Shuttleworth & Cowie, 1997, p. 100). They "aimed to create formulae and algorithms for something as fluid as language and wanted to keep context out of such a contextual activity as translation" (Morini, 2008, p. 33). Thus, 'science of translation' and '*übersetzungswissenschaft*' became popular buzzwords for translation scholars. Likewise, the notions of equivalence, correspondence, and equivalence-of-meaning grew to be associated with translators, and—both in theory and in practice—were placed within the broader framework of translation theory: e.g. Catford's formal correspondence (1965) and Nida's formal and dynamic equivalence (2003). Within this approach, linguistics defines translation and, as Catford (1965, p. 1) argues in his well-known book *A Linguistic Theory of Translation*, "clearly, then, any theory of translation must draw upon a theory of language—a general linguistic theory."

Equivalence is a potent and resonant term in the history of translation studies. It has been cultivated over the course of decades and is reflected in a number of definitions of equivalence that have emerged over time. The most notable definitions of translation of the period, i.e., those of Catford and Nida and Taber, all bear the insignia of equivalence. Catford (1965, p. 20), who subsumes translation theory under comparative linguistics, defines translation as "the replacement of textual material in one language (SL) by equivalent textual material in another language (TL)." He even goes so far as to claim that "the central problem of translation practice is that of finding TL translation equivalents. A central task of

translation theory is that of defining the nature and conditions of translation equivalence" (ibid. p. 21). Catford's definition of translation can be widely understood as upholding the myth that there is always a one-to-one correspondence between a source text and its target text. Similarly, Nida and Taber (1969/1982, p. 12) claim that "translating consists in reproducing in the receptor language the closest natural equivalent of the source-language message, first in terms of meaning and secondly in terms of style." Also central to this debate is Jakobson's now famous statement that "equivalence in difference is the cardinal problem of language and the pivotal concern of linguistics" (Jakobson, 1959/2004, p. 139). Indeed, equivalence seems to have been the only mantra of translation at the time.

The translation term 'equivalence' is said to be a borrowing from mathematics or classical logic (Wilss, 1982, cited by Halverson, 1997, p. 28). Snell-Hornby (1995, p. 17) proposes that probably "the concept of Äquivalenz was taken over into German Übersetzungswissenschaft as a technical term from either mathematics or formal logic (or both)" as a convenient shorthand to capture the zeitgeist in the wake of the mass euphoria for machine translation that emerged in the 1950s. Equivalence as such (i.e. equal value) guarantees that the transformations are reversible; this is often the case with machine translation (the idea is that sentences in two different languages can be translated into each other and then back; the transformations should always yield an equivalent meaning). Either way, equivalence smacks strongly of certainty, linearity, and predictability.

In mathematics, an equivalence relation is that which is reflexive ($4 \leftrightarrow 4$), symmetric (if $4 \leftrightarrow 2 + 2$ then $2 + 2 \leftrightarrow 4$), and transitive (if $4 \leftrightarrow 2 + 2$ and $2 + 2 \leftrightarrow 3 + 1$ then $4 \leftrightarrow 3 + 1$). In logic, the two parts of a relation, namely p (precedent) and q (consequent), are equivalent if the necessary and sufficient condition is satisfied. p is sufficient and necessary for q: A triangle is equilateral if and only if all its angles measure 60°, which means both "If a triangle is equilateral, then all its angles measure 60°" and "If all angles of a triangle measure 60°, then the triangle is equilateral." The necessary and sufficient condition stated for logical equivalence ensures the guaranteed reversibility of p and q, which can be easily reduced to the second condition of mathematical equivalence, i.e., symmetry. Translate a target text back to its original to see how quickly this condition fails.

4. Seeds of Distrust in the Certainty of Equivalence

However, developments in the 1970s helped dethrone the dogma of equivalence, and thus uncertainty began to be systematically incorporated into

theories of translation. James Holmes (1988/2004) introduced the term 'Translation Studies.' From his division of the discipline into the two broad categories of 'pure translation studies' and 'applied translation studies' and the subdivision of the former into two further areas, the term 'descriptive translation studies' emerged. The concept of descriptive translation studies was later fleshed out by Gideon Toury. To quote Pym (2010/2014, p. 55), "instead of analyzing translation situations and alternatives to traditional equivalence, this paradigm annulled the appeals to equivalence". Toury (1978/2004) built on Even-Zohar's (1978/2004) work with polysystem theory. He introduced the concept of translation norms, showed how the norms of the target culture can change our understanding of equivalence, opposed the a-priopri approach to understanding translation in general and equivalence in particular by emphasizing that it does more than just mirror the source, and pushed the boundaries of translation far beyond linguistic anisomorphisms to catch different societal nuances in the target culture.

Regarding the status of equivalence, Toury argues that it is "the norms that determine the (type and extent of) equivalence manifested by actual translations" (Toury, 1995/2012, p. 61). "Equivalence [...] is of little importance in itself. There is a point in establishing it insofar as it can serve as a stepping stone to uncovering the overall CONCEPT OF TRANSLATION underlying the corpus it has been found to pertain to" (Toury, 1995/2012, p. 86, emphasis in original). Within this approach, the status of equivalence is defined less in prediction than in retrodiction. The rejection of equivalence was in part due to the emergence of Reiss and Vermeer's Skopos theory. Their 1984 theory proposes that texts must meet a specific purpose in the target culture, a definition which rejected equivalence as an overarching concept. Snell-Hornby went so far as to call equivalence illusory, fallacious, and distorting (1995, p. 22). Theo Hermans is more vociferous on the topic, "equivalence means the ultimate limit, the vanishing point, and thus the end of translation, also the death of the translator. Equivalence resolves translation (Hermans, 2004, cited by Delabastita, 2008, p. 245).

5. Centrality of the Uncertainty Paradigm in Current Theories of Translation

Translation studies today stands at a crossroads. The world around it is changing rapidly, not only because of new technologies and the Internet, but also because of the legacy of colonialism, postcolonialism, and globalization. In the wake of these changes, translation studies is called upon to rethink its concepts to reflect the current state of translation, to act as a guiding tool, and to guide the

future of translation. Translation scholars must look for ways to renew translation studies to align it with the emergent needs of the translation profession, the translation industry, and translation scholarship, and to achieve translation practices that are more socially responsible, politically aware, culturally sensitive, and economically beneficial. Scholars also need to draw more on the knowledge and practices of other disciplines to provide a conceptual and methodological foundation for researchers, practitioners, and students of translation. This is more or less the reason why instead of equivalence, issues such as uncertainty, nonlinearity, fuzziness, and complexity have come to the forefront of translation studies in recent years.

In his book *Exploring Translation Theories*, Pym (2010/2014) identifies uncertainty as one of the six central contemporary paradigms of translation studies, the others being equivalence, purpose, description, localization, and cultural translation. Pym (2010/2014, pp. 96–105) presents a tentative list of theories of dealing with uncertainty (illumination; consensus; hermeneutics; constructivism; game theory; nonlinear logic, which itself includes complexity theory, fuzzy logic as partial set membership, and fuzzy logic as simultaneous set membership; and theories of semiosis). However, the weakness in all of these theories is that they are treated individually, and the impression is that there is no connection between them, or at best a tenuous one. The number of mentions of the above theories in *Complexity Thinking in Translation Studies: Methodological Considerations* (Marais & Meylaerts, 2019), a volume consisting of 12 chapters written by 15 scholars from cultural contexts as diverse as the United States, South Africa, Brazil, and Iran, is telling. Although the volume deals with nonlinearity, uncertainty, and complexity in translation, it makes little use of theories other than complexity theory. A brief statistic: fuzzy logic is mentioned only once, hermeneutics four times, semiosis 39 times (31 times in a single chapter on intersemiotic translation), and the others do not rate a mention even once.

Too often, the tools we use to describe and understand uncertainty are treated individually and in isolation. However, all of these theories of uncertainty can be bundled together and used as a raft to address an uncertainty problem. When we apply them together, they complement and reinforce each other. With the overarching view we have as a result, we can address some problems that would be intractable if we applied them individually. Perhaps the most comprehensive explanation of uncertainty is obtained by including all possible and relevant views into a coherent picture. To include all the relevant theories, we must first review

them. Then we will see that each theory defines a different boundary for uncertainty, but that within that boundary things do not look as different as all the theories claim. Uncertainty itself cannot be traced to a single source. The validity of the scientific theory, the nature of the measurement instrument, the sample size, the margin of error, the way the experiment is designed and conducted, errors in data analysis, publication bias, and ethical and social issues all contribute to uncertainty. Likewise, the best way to deal with uncertainty is to ask as many relevant questions as possible and solicit multiple sources of information. Synergy occurs when the whole is greater than the sum of its parts, as is the case with dynamic and complex systems like translation. Synergy can also occur when different ideas, theories, methods, and practices are used together. Each theory taken by itself is simple, almost trivial. It is only when taken together that they yield insights that would not be possible if they were used in isolation. For example, Blumczynski and Hassani (2019) combine some tenets of fuzzy logic and game theory to propose a meta-theoretical model for translation. They argue that to avoid the linearity and unidimensionality of equivalence, and translation by extension, it is not enough to reconstruct it as a continuum, which is still linear and limited in perspective; rather, relying on insights from fuzzy logic and game theory, they propose an approach that is multidimensional and potentially capable of capturing myriad aspects and nuances of equivalence and translation.

6. Final Remarks

In this study we showed that in the past, science and translation studies both rested on an attitude of apodicticity. However, they gradually underwent a transitional phase, where one of their initial assumptions about knowledge—that it is fixed and "truthful"— started being countered at every level. Consequently, these fields came to accept ambiguity, uncertainty, and fuzziness as vital aspects of all genuine inquiries. As such, translation studies no longer strives to achieve absolute, codified or binding models of translation but instead embraces its own inherent contradictions. These contradictions courageously remind us that any inquiry into a process as historically mutable and culturally variable as translation is inherently bound to be deeply askew. "To say "I am not sure" [...] is not a sign of poor scholarship [...]. Rather, it reflects a commitment to resist the pressure [...] to seek clarity and certainty in the face of complex, confusing and ambiguous experience" (Blumczynski & Hassani, 2019, p. 347).

The last two decades or so has witnessed significant progress in the study of uncertainty in translation. What was once seen as a minor issue has now been elevated to the status of a paradigm. This raises the obvious question: what is next? As mentioned earlier, scholars tend to treat the theories within the uncertainty paradigm individually and independently, with the impression that there is little connection between them. The real danger is that with no attempt to link them and see the patterns, we can fall into a theoretical trap, because each theory is interested in different levels of translation or it wants to look at problems from different angles. We can then remain oblivious of the fact that there are strong parallels between them. The many faces of uncertainty must be viewed as overlapping, rather than as independent. This will help us understand the theoretical, methodological and practical implications of the uncertainty paradigm. The purpose of theorizing about translation is to reveal the mechanisms of translation phenomena. Today, when a number of theories related to translation have already been put forward, the chief aim is no longer to invent these theories, but to explicate and refine them. In this situation, what we might now need is not further theorization, but conceptual clarification: clarifying how these diverse theories relate to one another and whether they can be unified into a more encompassing theory.

Another threat of this paradigm is its possible misapplication. To function adequately, uncertainty theories must meet certain conditions. When applied to domains outside their realm of applicability, they may lead to incoherent interpretations or systematic inexactitudes. For example, probability, as a theory of uncertainty, has often been misapplied in some theories of translation studies and confused with fuzzy logic—often with unfortunate consequences. The reason for this misunderstanding and misapplication is the fact that there has been confusion about how probability should be understood epistemologically. Probability, like statistics and information theory, is a mathematical formalism developed to account for the occurrence of uncertainties in observable physical processes. As such this formalism is rooted in, and builds upon, classical set theory, according to which set members are either in the set or not. However, probability is often mistaken for fuzzy logic. Fuzzy logic is multivalued. It deals with degrees of membership and degrees of truth; as such, in fuzzy logic, propositions can be partially true and false at once. A famous misapplication of probability theory to translation studies relates to Toury's laws of translation, namely the law of growing standardization and the law of

interference (Toury, 1995/2012). For a detailed analysis, see Hassani (2018, pp. 216–229).

Therefore, a closer study of what is being adopted as the uncertainty paradigm in translation studies and a case-by-case examination of its various manifestations is required. The exploration of its premises and assumptions may offer a way out of a possible discourse deadlock.

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