LUBLIN STUDIES IN MODERN LANGUAGES AND LITERATURE
Maria Curie-Sklodowska University Press
Vol 48, No 3 (2024)
E-ISSN 2450-4580

Martina Behr, University of Innsbruck, Austria

DOI:10.17951/lsmll.2024.48.3.53-64

Interpreting Studies and the Need for a Systemic Turn

ABSTRACT
The next important step in the development of Interpreting Studies appears to be its methodological consolidation, which can be achieved by drawing on the findings of systems theory. Systems theory makes it possible to grasp the complexity of interpreting and to master the resulting interdisciplinary methodological challenges. The example given in this article of the first system-dynamic model of simultaneous interpreting demonstrates the advantages of such an approach and explains that it is time for a systemic turn.

KEYWORDS
Interpreting Studies; complexity; systems theory; modelling

1. Introduction

"Systemtheoretische Konstruktionen entstehen in aller Regel erst auf einer bestimmten Entwicklungsstufe einer Wissenschaftsdisziplin" (Salevsky, 2021, p. 84)[1]. This quote and a look at the development of Interpreting Studies (IS), as shown in Figure 1, shows that our discipline has made considerable progress over the last decades.

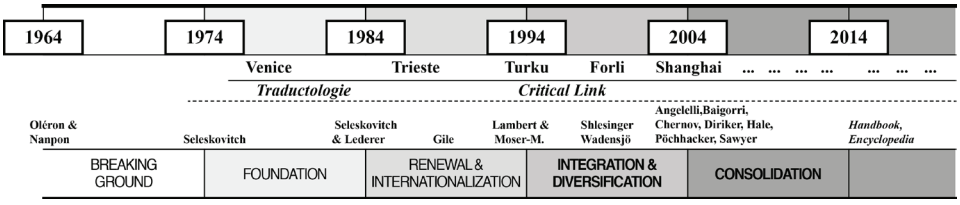

Figure 1: Decades of development in Interpreting Studies (Pöchhacker, 2016[2], p. 48)

[1] As a rule, systems theory constructs only emerge at a certain stage in the development of a scientific discipline.

Martina Behr, Institut für Translationswissenschaft, Universität Innsbruck, Herzog-Siegmund-Ufer 15, 4. OG, 6020 Innsbruck, martina.behr@uibk.ac.at, https://orcid.org/0000-0002-5053-292

The journal is financed by the Institute of Modern Languages and Literatures of Maria Curie-Sklodowska University.

We can certainly agree with Pöchhacker (2016) in spotting a consolidation of IS. However, as an interdisciplinary field, IS depends on interdisciplinarity and a rigorous application of external methods. Therefore, as Figure 2 shows, IS still needs to achieve a methodological consolidation (cf. Behr, 2020, p. 13). This article explains why a systems-theoretical orientation of IS can contribute to its systematization and thus consolidation, and why the time for a systemic turn seems to be ripe. Accordingly, this article explains a) the complexity of interpreting, and b) the resulting challenges for IS with regard to its methodology, c) gives an example of what a corresponding application, i.e. a model, could look like and d) provides a brief outlook for the application of this approach.

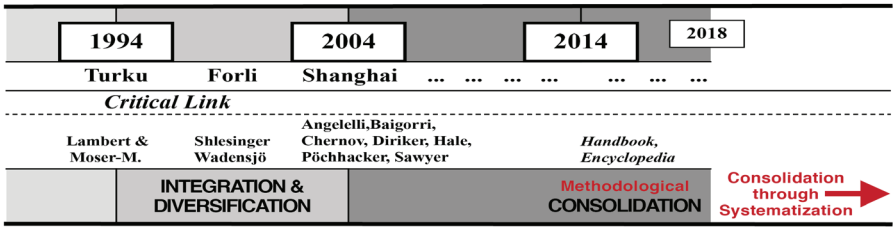

Figure 2: Current development of Interpreting Studies (Behr, 2020, p. 14)

2. Complexity of interpreting and challenges for Interpreting Studies

Undoubtedly, we can say that interpreting is ontologically highly complex, as it is made up of a large variety of factors that (can) influence each other. Interpreting is a "structure within a structure" (Pöchhacker, 1994, p. 45), "highly diverse and multi-faceted" (Pöchhacker, 2009, p. 43), and an "overall web of constraints"[2] (Kade, 1977, p. 35). It is also described as a chaos of factors (Vermeer, 2006, p. 302), referring to several dimensions, at least at the "factual, social, temporal, operative, cognitive" level (Salevsky, 2011, pp. 34–35). For the purposes of analysis, complex phenomena can be understood or modelled as a system using the framework of systems theory as an interdisciplinary approach. In terms of systems theory, complexity results from a) the number of elements in the system, b) the connections between those elements or their influences on each other, c) a certain dynamic, and finally d) so-called emergent properties. The latter results from the fact that individual elements (can) develop further characteristics in addition to their original characteristics when they interact. This is also often referred to as systems being over-summative; Aristotle expressed this in the now well-known saying 'The whole is greater than the sum of its parts' (Ropohl, 2012, p. 25 and 45). Accordingly, the interpreting system is also more than just the sum of its parts.

[2] Translation by Salevsky (2011, p. 25) of the original term "Gesamtbedingungsgefüge".

For example, a too-high speaking speed alone (>120 wpm, Seeber, 2005, p. 127) is not decisive for the question of whether a speech can be interpreted perfectly in terms of completeness. It is only the interaction with other factors such as information density, degree of technicality and structuring, intonation on the part of the speech/the speaker and preparation (dedicated time, provided material, etc.), alertness, motivation, competence, etc. on the part of the interpreter, that defines the prerequisites for a fully complete interpretation. And as the elements of a system influence each other, systems are also considered dynamic. Finally, Lotfi Zadeh's fuzzy logic is relevant for systems theory modelling. System elements can be vague or 'fuzzy', i.e. they cannot be captured statistically. The integration of such elements into a model makes it possible to model a reflection of reality despite the lack of exact data (cf. Vester, 2011, pp. 179–181). If, for example, interpreting is modelled so as to better understand this phenomenon, fuzzy components such as the interpreter's concentration or the speaker's intonation can also be integrated into the model according to systems theory principles.

3. Complexity of (research perspectives in) Interpreting Studies

The complexity of interpreting is also reflected in the diversity of interpreting research approaches, and this leads to a variety of scientific perspectives depending on the (paradigmatic) approach that is chosen, for example linguistic, cognitive, neurophysiological, discourse-analytical, socio-psychological, sociological, anthropological, historical, ethical, etc.

A look at the development of IS shows the challenges this complexity leads to. The science of interpreting began with prescientific work in the Kuhnian sense (e.g. Herbert, 1952) and was subsequently characterised by interpreting being researched by so-called "practisearchers" (Gile, 1994, p. 156) where intuitive approaches prevailed, strengthened by the Paris School around Danica Seleskovitch. It was not until the conference of Trieste in 1986 that the empirical turn was heralded, and interpreting research took on a scientific orientation. The natural science community, which was conducting research along these lines, was soon confronted with the liberal arts community, and thus two supposedly opposing methods began to coexist (Moser-Mercer, 1994, p. 19): empirical-quantitative research on the one hand and hermeneutic-qualitative research on the other. Overcoming the intuitive approach led to emphasizing the latter and neglecting the former. But, as a result, the methods of other disciplines had to be applied, and it also led to a discussion on and search for the appropriate methodology (cf. Angelelli & Baer, 2016; Hale & Napier, 2013). However, the resulting and necessary interdisciplinary approach presents a difficulty: "A lack of deep knowledge in a field from which the methodology is adopted may become an obstacle in producing good research work in translation and interpreting studies" (Liu, 2011, p. 104). Furthermore, interdisciplinary research

projects appear to be limited to individual and temporary projects, and the desirable reciprocity (Kaindl, 2004, p. 71) has still to be found. Consolidating the methodology outlined in the present article and the quest for reciprocal interdisciplinarity it advocates would thus be the next decisive step in the further development of IS.

Until now, we mainly see two types of research in IS: on the one hand, empirical studies of a more atomistic nature, in which one variable is investigated in isolation (even though, often, the other variables are not or cannot be rigorously controlled)[3] and, on the other hand, more holistic studies of a phenomenological nature. The latter also includes attempts to grasp the complexity of interpreting. However, even in holistic models, the reductionist characteristic inherent in all models comes into play (cf. Stachowiak, 1973, p. 208), since they focus only on a certain aspect of the whole, e.g. the interaction (e.g. Alexieva, 1997; Poyatos, 1987/2002; Stenzl, 1983), the process (without a real situational embedding) (e.g. Kalina, 1998; Moser, 1978; Seleskovitch & Lederer, 1984; Setton, 1999) or, even more specifically, the cognitive process on the part of the interpreter (e.g. Darò & Fabbro, 1994; Mizuno, 2005; Seeber & Kerzel, 2011) or certain settings such as media interpreting (Katan & Straniero-Sergio, 2003). A truly holistic model of interpreting as a complex phenomenon is still lacking. To grasp the whole, the correlation between the multiple factors involved in interpreting needs, in particular, to be identified and depicted (Salevsky, 1986, p. 12), but this has not been done sufficiently so far (Salevsky & Müller, 2011, p. 194).

The dichotomy between the humanities and the natural sciences in interpreting research and, therefore, the sometimes very different perspectives on the common subject of interpreting still make it difficult for IS to be recognised by other disciplines, and for cooperation across disciplinary boundaries to take place. It should be emphasised that neither one scientific orientation nor the other should be given priority. Table 1 (partially taken from Hale & Napier, 2013, p. 15; Monacelli, 2015, p. 258; Schummer, 2014, p. 12) shows the different perspectives from which research or a subject of research can be seen. The overview also makes it clear that both approaches are equally justified. While analytical approaches focus on verifiable details, hermeneutic approaches are centred on understanding the parts through the whole and the whole through its parts (Leibbrand, 2011, pp. 100–101).

Table 1 also shows that theory does not arise from the direct derivation of empirical data, but is also a prerequisite for empiricism (cf. Kaindl, 2004, p. 71). Accordingly, both columns of the table must be seen as complementary strands of research. If, following Vermeer, translation (or interpreting) is understood

[3] Here, too, the principle of fuzzy logic (cf. section 2) provides an answer.

Table 1. Complementary characteristics of the research approaches

dimension	natural sciences approach	humanities/liberal arts approach
epistemology	analytical	hermeneutical
aim	explanation of causes	understanding of contexts
focus	replicability, regularities	no replicability, singularities
methodology	positivist, verification of details	phenomenological, looking at the whole
scope	atomistic	holistic
	↓	↓
ontology	Facts and data are objectively real.	Reality is a social construct.
research method	quantitative, empirical	qualitative, theoretical
researcher's stance	(more) objective, descriptive, statistical	(more) subjective, interpretive
data collection	e.g. survey, experiment	e.g. qualitative interview, case study
logic	deductive, hypothesis testing	inductive, hypothesis generation
	↓	↓
focus of analysis	data collection, individual phenomena	interpretation of data, overall context
variables	can be isolated and measured	complex, interdependent, and difficult to measure, the term 'variable' is rarely used
quality criteria	high reliability	high validity
	↓	
	knowledge gain	

as (system-theoretical) action, its regularities must be further (empirically) researched. It must also be (hermeneutically) taken into account that such action remains somewhat probabilistic (Vermeer, 2006, p. 24). It is the complementarity of both perspectives that leads to a comprehensive gain in knowledge. In other words:

> It is fascinating to speculate about the mental processes involved in interpretation, but speculation can do no more than raise questions. If we want answers to those questions they will have to be based on facts rather than mere assumptions. Before we can develop solid models of the whole process of interpretation we will need empirically validated models […]. (Stenzl, 1983, pp. 47–48)

4. Systems theory in Interpreting (and Translation) Studies

Connecting and complementing the different approaches can solve the above-mentioned dilemma of IS, especially if it is done in a systematised way. If the holistic approaches fail due to the large number of variables, and the atomistic

approaches lack a framework within which they can be better considered, replicated, and anchored, the benefits of complementation become evident. An appropriate framework, in which the complexity of interpreting can be mapped and where, in the long term, this mapping is increasingly based on all the single empirical studies, should help to answer the questions posed by IS, thanks to the combination of overarching assumptions with concrete data.

Such a framework can be found in a systems theory approach. For the field of translation Klaus Kaindl already stated that, instead of importing methods from other individual sciences, the so-called 'systems disciplines' such as systems theory should be considered. This is because, based on the complexity of translation, its elements could be understood not only as individual components but also in their interactional context (Kaindl, 2004, p. 68).

In addition to Kaindl, some other works point out the added value of systems theory for Translation Studies (cf. Hermans, 1999; Poltermann, 1992; Tyulenev, 2012; Vermeer, 2006). But these approaches, referring to Luhmann's systems theory (see section 6), are far from being fully developed theories (Siever, 2015, p. 208). Interpreting, in turn, is modelled by Hella Kirchhoff (1976, p. 22) as a bilingual, tripartite communication system in which the indication of relationships between some of the elements of the system is included. Heidemarie Salevsky (1986) emphasises the systemic nature of simultaneous interpreting early on and ultimately bases her development of a general theory for translation and interpreting on Parsons' system theory principle (Salevsky, 2011). She thus provides a comprehensive basis for a systems theory approach. However, it has not yet led to a reorientation of IS. Also, it took almost 10 years for her theoretical proposal – which Müller (2011) applied to translation – to result in a system-dynamic modelling of simultaneous interpreting (see section 5; Behr, 2020). This modelling is, with the help of an online accessible software tool, a first attempt to create a system-theoretical framework that both captures interpreting in its entirety and can be used to structure and improve IS as a discipline.

The idea of systems theory dates back to the times of Aristotle (Ropohl, 2012, p. 25). Since the middle of the 20th century various trends have developed, above all Norbert Wiener's cybernetics, Ludwig von Bertalanffy's general systems theory and Niklas Luhmann's sociological systems theory as a continuation of Talcott Parsons' systems functionalism (to which Salevsky, 2011, pp. 38–40 also refers). In addition to terms such as 'chaos theory', the system dynamics developed by Jay W. Forrester (see section 5) have been established since the 1950s for researching complex adaptive systems (DGSD, n.d.; Ropohl, 2012, pp. 29–37).

The basic idea of systems theory arises, among other things, from the history of the development of knowledge and the associated increase in scientific disciplines, together with the growing complexity of our world. Against this

background, the philosopher Günter Ropohl (2012) explains the advantage of thinking in systems:

> Es gibt [...] zwei Tendenzen der neuzeitlichen Wissenschaft, gegen die das Systemdenken Einspruch einlegt. Zum einen ist es die elementarisierend-analytische Sichtweise, die auf Galilei und Descartes zurückgeht und den Erkenntnisgegenstand in immer kleinere Teile zerlegt, damit diese dann mit „bewährter" Methodik exakt erfasst werden können. Das läuft auf eine Atomisierung der Welt und des Wissens hinaus, die sich in der Sektoralisierung der Disziplinen widerspiegelt und nur noch schmale Ausschnitte der Erfahrungswirklichkeit in den Blick nimmt. Zum anderen kritisiert das Systemdenken die weitgehende Unfähigkeit der Disziplinen, die dynamische Entwicklung komplexer Ganzheiten angemessen zu thematisieren, weil sie mit ihrer Sektoralisierungsstrategie die vielfältigen Verflechtungen und Wechselwirkungen zwischen den abgegrenzten Ausschnitten aus dem Auge verlieren. Gegen die Atomisierung der Welt und des Wissens plädiert das Systemdenken dafür, die ganzheitlichen Zusammenhänge in den Vordergrund zu stellen. (p. 20)[4]

5. Benefits of a systemic model of simultaneous interpreting

Our discipline can make a great leap forward in its development if the two tendencies mentioned above can be overcome with the help of the systems theory approach. Insights gained from the first system-theoretical model of simultaneous interpreting, the so-called *i-Model of SI* (Behr, 2020) provide the first proof of the benefits of this approach. The *i-Model* was created based on the so-called system dynamics approach. Simply put, system dynamics represents the method that results from systems theory as a way of thinking. It is primarily used in the fields of business administration and economics. System dynamics is used to create a qualitative model, to identify and analyse cause-and-effect relationships, to map system relationships within the framework of a quantitative model, if applicable to run a simulation of the model and thus to understand a system. The system dynamics method became known in 1972 when Dennis Meadows used it to model a scenario of the future global economy and published it in the report "The Limits to Growth" (DMP, 2013).

[4] There are two tendencies in modern science to which systems thinking objects. The first is the elementarising-analytical view, which goes back to Galileo and Descartes and breaks down the object of knowledge into ever smaller parts so that these can then be precisely recorded using 'proven' methodology. This amounts to an atomisation of the world and of knowledge, which is reflected in the sectoralisation of disciplines and only focuses on narrow sections of the reality of experience. On the other hand, systems thinking criticises the extensive inability of disciplines to adequately address the dynamic development of complex wholes because their sectoralisation strategy causes them to lose sight of the diverse interrelationships and interactions between the delimited sections. Against the atomisation of the world and of knowledge, systems thinking advocates placing the holistic interrelationships in the foreground.

The *i-Model* was created by using free software, i.e. the i-Modeler by *Consideo* (Consideo). Figure 3 is a screenshot of this model that can be accessed online[5] and gives an impression of the fact that the complexity, i.e. all the elements of simultaneous interpreting and the relationships between them, can be captured and represented. The software makes it possible to define and weigh all the system's factors and their relationships without losing the overview.

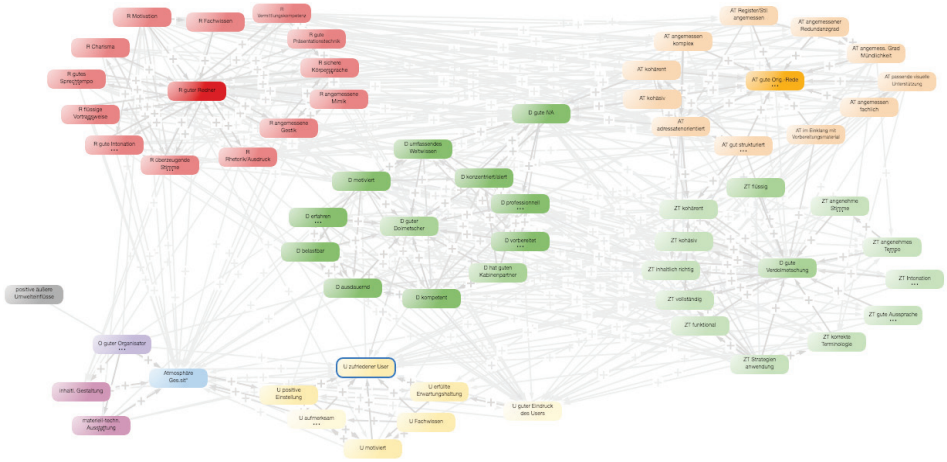

Figure 3: Impression of complexity – the *i-Model* of simultaneous interpreting (Behr, 2020, p. 220)

The *i-Model* is made up of subsystems (in our case the speech, the speaker, the interpreter, the interpretation, the interpreter's cognitive process, the listeners, and the situation subsystems), each of which being defined by specifying the associated sub-factors. The software also enables the definition (and weighting, if necessary) of all relations between the factors and helps the user maintain an overview despite the large number of elements. The overall model consists of 63 factors and 491 connections, which are saved by the software and can be displayed as required. The underlying algorithms, including effect loops, calculate the influences of every factor on every other factor. The impact of each influence can be displayed in relation to any other factors selected, e.g. 'How much influence does factor xy have on factor z compared to factors a-g?'. Thanks to the principle of networked thinking (cf. Vester, 2011), the software makes it possible to create a holistic model of interpreting, including complexity, fuzziness, and dynamics.

[5] http://www.know-why.net/ro?key=CE0Q6rFLMd2mbgSzXtj_BOQ (retrieved on March 10, 2024).

The *i-Model* shows that a systems theory approach makes it possible to combine the atomistic approaches with the holistic approaches by placing the necessarily small-scale research of the individual elements in the all-determining overall context and relating the individual variables to each other. Individual factors within the model, which were, to begin with, determined hermeneutically and are qualitative in nature and fuzzy, can be singled out and operationalised for empirical studies. The quantitative findings can then be integrated into the model so that both research trends complement each other; hermeneutic procedures are used to formulate hypotheses, which are then empirically tested and can, in turn, contribute to further theorising.

The *i-Model* can be of practical use as a place for systematizing interpreting research. Information on individual factors can be stored in the corresponding boxes (e.g. literature lists[6], study designs to increase the number of replication studies (Gile, 1990, 2005), proven methods for measuring cognitive load in interpreting, etc.). Areas in which there is still a particular need for research can be highlighted in colour (cf. Behr, 2023, p. 228). Such a use of a model should help to further deepen research in IS and to foster greater comparability of studies and perhaps even more intensive cooperation between different researchers (cf. Lonsdale, 1997, pp. 103–104).

Apart from these advantages for IS as a whole and a possible pedagogical use (cf. Behr, 2023) the *i-Model* confirms, to a certain extent at least, some (intuitive) assumptions or findings in our field. According to the *i-Model*, factors on the part of the speaker have a comparatively strong influence on the user. This supports the postulate of relative quality (Behr, 2020, p. 236; Riccardi, 2002, 2007). When asking the software to display the intensity of influence of content vs. formal criteria for quality in interpreting, we find proof of the difference between expected vs. perceived quality (Behr, 2020, p. 238; Collados Aís, 1998/2002, p. 336). For example, after calculating all relations and causal relationships within the model, the content criterion of correctness has over 16 times less influence on the listener's satisfaction than the interpreter's speech rate (Behr, 2020, p. 240). This also shows how much research still needs to be done.

6. Conclusion

Some difficulties in IS can be overcome using a systems theory approach. Although the idea of referring to systems theory has been around since the 1980s (Salevsky, 1986), it is still not considered to any great extent. This article has explained its

[6] The AI-based tool Connected Papers (https://www.connectedpapers.com, retrieved on March 10, 2024) can now also offer this advantage quite well. In the long term, it would be conceivable to integrate such tools into the corresponding modelling, provided that cooperation with computer science can be implemented.

advantages for IS by applying the systems theory approach and shown why the time is ripe for a systemic turn in our discipline. The *i-Model* provides initial evidence of the systemic approach's benefits by indicating a concrete application of this approach. However, this should not hide the fact that, for a rigorous implementation, some discussions still need to be held. We have to discuss, for example, which system-theoretical orientation is the right one (see section 4, and for the discussion about deductive vs. inductive approaches see Salevsky, 2021, pp. 83–84). We have to agree on whether subsystems need to be expanded or added to, e.g. to take account of the socio-cultural background (cf. Salevsky, 2021, p. 87 referring to Müller, 2008). In particular, the choice of software needs to be discussed. In contrast to almost all other providers, the software by *Consideo* offers sufficient functions in its free version, but has shortcomings that do not stand up to scientific use in the long term (cf. Behr, 2020, pp. 235–240). The software recommended by Salevsky, the *Sensitivity Model Prof. Vester©* or its successor *System Logics* (System Logics), entails high costs. Such costs seem justified given the scientific use but impede the use of the model as an online tool accessible to all for the systematisation of IS. Nevertheless, systems theory can bring great benefits when it comes to the next step in the development of our discipline. Should we not now at least start the discussion and finally embark on the path towards a systemic turn?

References

Alexieva, B. (1997). A Typology of Interpreter-Mediated Events. *The Translator, 3*(2), 153–174. Routledge. https://doi.org/10.1080/13556509.1997.10798996

Angelelli, C. V., & Baer, B. J. (Eds). (2016). *Researching Translation and Interpreting*. Routledge. https://doi.org/10.4324/9781315707280

Behr, M. (2020). *Dolmetschen: Komplexität, Methodik, Modellierung.* Frank & Timme.

Behr, M. (2023). Systemic modelling. A new approach to Interpreting Studies teaching and research. In C. Zwischenberger, K. Reithofer, & S. Rennert (Eds.), *Introducing New Hypertexts on Interpreting (Studies). A Tribute to Franz Pöchhacker* (pp. 214–234). John Benjamins. https://doi.org/10.1075/btl.160

Collados Aís, Á. (1998/2002). Quality Assessment in Simultaneous Interpreting: The Importance of Nonverbal Communication. In F. Pöchhacker, & M. Shlesinger (Eds.), *The Interpreting Studies Reader* (pp. 327–336). Routledge.

Consideo. (n.d.). Retrieved March 10, 2024, from https://www.consideo.de/infos.html

Darò, V., & Fabbro, F. (1994). Verbal Memory During Simultaneous Interpretation. *Applied Linguistics*, *15*(4), 365–381. https://doi.org/10.1093/applin/15.4.365

DGSD, Deutsche Gesellschaft für System Dynamics. (n.d.). *Kurze Einführung in System Dynamics Allgemein*. Retrieved March 10, 2024, from https://www.systemdynamics.de/system-dynamics-method/ueber-system-dynamics/allgemein/

DMP, Donella Meadows Project (2013). *Academy for Systems Change*. Retrieved March 10, 2024, from http://donellameadows.org/the-limits-to-growth-now-available-to-read-online/

Gile, D. (1994). Opening up in Interpreting Studies. In M. Snell-Hornby, F. Pöchhacker, & K. Kaindl (Eds.), *Translation Studies. An Interdiscipline* (pp. 149–158). John Benjamins. https://doi.org/10.1075/btl.2.20gil

Gile, D. (1990). Research proposals for interpreters. In Gran, L., & Taylor, C. (Eds.), *Aspects of Applied and Experimental Research on Conference Interpretation* (pp. 226–236). Campanotto.

Gile, D. (2005). Empirical research into the role of knowledge in interpreting: Methodological aspects. In H. van Dam, J. Engberg, & H. Gerzymisch-Arbogast (Eds.), *Knowledge Systems and Translation* (pp. 149–171). De Gruyter.

Hale, S., & Napier, J. (2013). *Research Methods in Interpreting: A Practical Resource*. Bloomsbury. https://doi.org/10.7202/1037771ar

Herbert, J. (1952). *Handbuch für den Dolmetscher*. Librairie de l'Université Georg.

Hermans, T. (1999). *Translation in Systems: Descriptive and System-oriented Approaches Explained*. Routledge. https://doi.org/10.4324/9781315760469

Kade, O. (1977). Zu einigen Grundpositionen bei der theoretischen Erklärung der Sprachmittlung als menschlicher Tätigkeit. *Vermittelte Kommunikation, Sprachmittlung, Translation* (pp. 27–43). VEB Verlag Enzyklopädie.

Kaindl, K. (2004). Übersetzungswissenschaft im interdisziplinären Dialog. Am Beispiel der Comicübersetzung. Stauffenburg.

Kalina, S. (1998). *Strategische Prozesse beim Dolmetschen: Theoretische Grundlagen, empirische Fallstudien, didaktische Konsequenzen.* Narr. https://doi.org/10.1075/intp.4.2.08set

Katan, D., & Straniero-Sergio, F. (2003). Submerged Ideologies in Media Interpreting. In M. Calzada Pérez (Ed.), *A propos of Ideology. Translation Studies on Ideology – Ideologies on Translation Studies* (pp. 131–144). Routledge.

Kirchhoff, H. (1976). Das dreigliedrige, zweisprachige Kommunikationssystem Dolmetschen. *Le Langage et l'Homme*, *31*, 21-27.

Leibbrand, M. P. (2011). *Grundlagen einer hermeneutischen Dolmetschforschung*. Frank & Timme.

Liu, M. (2011). Methodology in Interpreting Studies. In B. Nicodemus, & L. Swabey (Eds.), *Advances in Interpreting Research: Inquiry in Action* (pp. 85–120). John Benjamins. https://doi.org/10.1075/btl.99.08liu

Lonsdale, D. (1997). Modeling Cognition in SI: Methodological Issues. *Interpreting*, *2*(1/2), 91–117. https://doi.org/10.1075/intp.2.1-2.04lon

Mizuno, A. (2005). Process Model for Simultaneous Interpreting and Working Memory. *Meta*, *50*(2), 739–752. https://doi.org/10.7202/011015ar

Monacelli, C. (2015). Epistemology. In F. Pöchhacker (Ed.), *The Routledge Encyclopedia of Interpreting Studies* (pp. 142–143). Routledge.

Moser, B. (1978). Simultaneous Interpretation: A Hypothetical Model and its Practical Application. In D. Gerver, & H. W. Sinaiko (Eds.), *Language Interpretation and Communication*. *NATO Conference Series 6* (pp. 353–368). Springer. https://doi.org/10.1007/978-1-4615-9077-4_31

Moser-Mercer, B. (1994). Paradigms Gained or the Art of Productive Disagreement. In B. Moser-Mercer, & S. Lambert (Eds.), *Bridging the Gap: Empirical Research in Simultaneous Interpretation* (pp. 17–23). John Benjamins. https://doi.org/10.1075/btl.3.03mos

Müller, I. (2008). *Die Übersetzung von Abstracts aus translationswissenschaftlicher Sicht (Russisch-Deutsch-Englisch): Eine Untersuchung am Beispiel von Abstracts aus russischen Fachzeitschriften zur Schweißtechnik und ihren Übersetzungen ins Deutsche und Englische*. Frank & Timme.

Poltermann, A. (1992). Normen des literarischen Übersetzens im System der Literatur. In. H. Kittel (Ed.), *Geschichte, System, Literarische Übersetzung / Histories, Systems, Literary Translations* (pp. 5–31). [Göttinger Beitrage zur International Übersetzungsforschung, 5.]. Erich Schmidt Verlag.

Poyatos, F. (1987/2002). Nonverbal Communication in Simultaneous and Consecutive Interpretation: A Theoretical Model and New Perspectives. In F. Pöchhacker, & M. Shlesinger (Eds.), *The Interpreting Studies Reader.* Routledge.

Pöchhacker, F. (1994). *Simultandolmetschen als komplexes Handeln*. Narr. https://doi.org/10.1075/target.7.1.16gil

Pöchhacker, F. (2009). Broader, better, further: Developing Interpreting Studies. In A. Pym, & A. Perekrestenko (Eds.), *Translation Research Projects*, *2* (pp. 41–49). Universitat Rovira i Virgili.

Pöchhacker, F. (2016). *Introducing Interpreting Studies* (2nd ed.). Routledge. https://doi.org/10.4324/9781315649573

Riccardi, A. (2002). Evaluation in Interpreting. Macrocriteria and Microcriteria. In E. Hung (Ed.), *Teaching Translation and Interpreting 4. Building Bridges* (pp. 115–125). John Benjamins. https://doi.org/10.1075/btl.42.14ric

Riccardi, A. (2007). Mikro- und Makrokriterien beim Simultandolmetschen. In J. House, & N. Baumgarten (Eds.), *Translationskritik: Modelle und Methoden* (pp. 187–205). AKS-Verlag.

Ropohl, G. (2012). *Allgemeine Systemtheorie. Einführung in transdisziplinäres Denken*. edition sigma.

Salevsky, H. (1986). *Probleme des Simultandolmetschens: Eine Studie zur Handlungsspezifik*. Akademie der Wissenschaften.

Salevsky, H. (2011). Part I. In H. Salevsky, & I. Müller (Eds.), *Translation as Systemic Interaction. A New Perspective and a New Methodology* (pp. 1-85). Frank & Timme. https://doi.org/10.1075/target.27.3.14kop

Salevsky, H. (2021). Neue Perspektiven für die Dolmetschwissenschaft durch systemtheoretische Modellierung. *Lebende Sprachen*, *66*(1), 82–92. https://doi.org/10.1515/les-2021-0003

Salevsky, H., & Müller, I. (2011). Part III. In H. Salevsky, & I. Müller (Eds.), *Translation as Systemic Interaction. A New Perspective and a New Methodology* (pp. 187–297). Frank & Timme. https://doi.org/10.1075/target.27.3.14kop

Schummer, J. (2014). *Wozu Wissenschaft?: neun Antworten auf eine alte Frage*. Kadmos.

Seeber, K. (2005). Temporale Aspekte der Antizipation beim Simultandolmetschen von SOV-Strukturen aus dem Deutschen. *Vereinigung für angewandte Linguistik in der Schweiz*, *81*, 123–140. https://doi.org/10.5169/seals-978485

Seeber, K. G., & Kerzel, D. (2011). Cognitive load in simultaneous interpreting: Model meets data. *International Journal of Bilingualism*, *16*(2), 228–243. https://doi.org/10.1177/1367006911402982

Seleskovitch, D., & Lederer, M. (1984). *Interpréter pour traduire.* Didier Érudition.

Setton, R. (1999). *Simultaneous Interpretation: A Cognitive-Pragmatic Analysis*. John Benjamins. https://doi.org/10.1075/btl.28

Siever, H. (2015). *Übersetzungswissenschaft. Eine Einführung.* Narr Francke Attempto.

Stachowiak, H. (1973). *Allgemeine Modelltheorie*. Springer.

Stenzl, C. (1983). *Simultaneous Interpretation: Groundwork towards a Comprehensive Model*. [Unpublished Master's thesis]. University of London.

System Logics (n.d.). Retrieved March 10, 2024, from https://www.system-logics.com

Tyulenev, S. (2012). *Applying Luhmann to Translation Studies: Translation in Society*. Routledge. https://doi.org/10.1075/target.26.2.17boy

Vermeer, H. J. (2006). *Versuch einer Intertheorie der Translation*. Frank & Timme.

Vester, F. (2011). *Die Kunst vernetzt zu denken* (8th ed.). dtv Wissen.