Theories of Language in IS Research – A Review

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1 Introduction

Language and design-oriented information systems (IS) research are indelibly intertwined. Analyzing the history of IS research it becomes evident that linguistics as a reference discipline became increasingly important over the last decades. Especially from the perspective of German design-oriented IS research/Wirtschaftsinformatik, language has been of great importance (Ortner, 2004; Wedekind et al., 2004; Holten, 2003; Becker et al., 2004; Heinemann, 2006; Ortner, 2002; Wyssusek et al., 2002; Becker a. Niehaves, 2007) and can be regarded as a key means for building up a profile of the Wirtschaftsinformatik in an international IS research context (Niehaves, 2006). However, language and its impact on IS research can be seen from different angles. In contrast to the prevailing positivism (Popper, 1972 p 10f.), re-searchers of the post-modern era regard IS as social or socio-technical systems or "technical systems with social implications" (Goldkuhl a. Lyytinen, 1982). Such post-modern theories have linguistic roots, especially language philosophy had significant impact on IS research. Moreover, a particular interest in IS research has been the development of approaches to overcome failings of the lack of communicative modelling. Out of these shortcomings, language oriented approaches such as the Language-Action-Perspective (LAP) arose. There is a growing awareness that linguistic theories are relevant for the design of information systems, especially for communication support systems (CSS). Regarding this research topic, theories on communication functions, among other theories of language, exert greatest impact on and importance in IS research

An integrated review of language-oriented IS research is of great importance for research practice. A broad variety of research has been conducted in recent years drawing upon theories of language in IS research.

However, the diversity of language-oriented approaches in IS necessitates a conscious reflection on what are major concern, terms, or goals of these plural-it approaches. Still, literature is lacking such integrated overview, bearing as consequence that the full potential of language-oriented theories for IS research, in terms of a comprehensive and constructive discussion, is not exploited yet. Against the background, it is necessary to give an overview of the different language-oriented schools of thoughts/research streams which are relevant to the field. Therefore, the main research question in this paper is:

What are the most relevant developments of language-oriented theories in IS research and how can an integrated analysis be utilized in order to increase relevance and applicability of language in IS research?

In order to answer this research question, the following sub-questions will guide the section-specific analysis:

- What are (original) substantial linguistic theories having an impact on IS research and what are their major characteristics? (Section 2).
- How has IS research adopted and applied such linguistic theories? (Section 3)
- What major language-oriented streams of thoughts can be identified and what are their bearings for IS research practice? (Section 4)

The paper concludes with a result summary and a discussion of potentially fruitful avenues for future research.

As research methods, empirical research was conducted. It comprised a comprehensive literature review in journals (including, for instance, Information Systems Journal, Wirtschaftsinformatik, MIS Quarterly, Information Research, The Computer Journal, ACM Transactions on Office Information Systems, The Journal of Applied Behavioural Science), conference proceedings (for instance, Proceedings of the International Working Conferences on the Language-Action Perspective on Communication Modelling, European Conferences on Computer-Supported Cooperative Work, Communication and Coordination in Business Processes, International Conference on Knowledge Management or the Americas Conferences of Information Systems), and published books covering theories of language in IS research.

2 Substantial Linguistic Theories

It is important to understand and analyse the original linguistic theories to recognize their adoption in IS research. According to Lyytinen (1985) "the very idea of an information sys-tem […] is to provide a means and an en-

vironment for communication" and "development processes, methods, and research programs, explicitly or implicitly, are based on a theory of linguistic phenomena." Therefore, the following subsections give short introductions into the most influential language theories in IS research: Speech Act Theory (Subsection 2.1), Theory of Communicative Action (2.2), Structural Linguistics (2.3), and Linguistic Turn (2.4). Although there are a lot more linguistic theories, which could possibly be adopted into IS research (like e.g. argumentation theory, Baroni, Giacomin a. Guida, 2005) those are only treated by a small IS research community and are therefore not further considered in this paper. Only those theories were selected, which, from our point of view, are regarded as fruitful in the IS research community, i.e. which are discussed in detailed for a longer period of time and/or which have a tangible result like a modelling approach or a computer-based coordination tool.

2.1 Speech Act Theory

Background: Pragmatics start from the observation that people use language to accomplish many kinds of acts, known as speech acts. The development of the Speech Act Theory (SAT) started with Austin's (1962) highly influential book *How to do things with words?* in which he stated his basic belief that language is used to perform actions. Based on this collection of seminal essays by Austin, Searle (1969, 1979) developed a theory of speech acts. Both were influenced by the late Wittgenstein (Wittgenstein 1953) and his Philosophical Investigations in which he states that "the meaning of a word is its use in speech".

Basic Assumptions and Theoretical Elements: Speech Act Theory today is mainly concerned with the illocutionary acts.[1] An illocution consists of an illocutionary force and a propositional content. The linguistic resources, which determine the illocutionary force, are called illocutionary indicators (sentence stress, word order, intonation).

According to Searle, an illocutionary act has different varieties:

[1] AUSTIN first suggested a dichotomy between performatives and constatives. By uttering a performative one performs an action, e.g. "I do take this woman to be my lawful wedded wife." Performatives are either felicitous or infelicitous, e.g. the utterance "I sentence you to six months in prison" is only felicitous when spoken by a judge in a courtroom. On the other hand, constatives like "she declared the meeting closed" only describe a state. AUSTIN had great difficulty in sepa-rating performatives and constatives clearly and came to the conclusion, to replace this distinction by the distinction be-tween different speech acts: The locutionary act, the illocutionary act and the perlocutionary act.

- Assertives: state what the speaker believes to be the case or not (statements, assertions, conclusions, descriptions, etc.) E.g.: "The earth is flat!"
- Declaratives: speech acts which change the world via their utterance. E.g. Referee: saying "You are out!"
- Expressives: state what the speaker feels, e.g. "I am really sorry that I forgot your birthday!"
- Directives: are used to get someone else do something (commands, orders, etc.), e.g. "Don't touch that!"
- Commissives: are used by speakers to commit themselves to some future action, e.g. "I'll be back soon!"

Goals and Achievements: The title of Austin's first publication *How to do things with words?* is a very catchy one regarding the goals of SAT. The theory was developed to explain how speakers use language to accomplish the goals of speech acts. As mentioned before, the basic belief is that language is used to perform actions (e.g. orders, promises, threats etc.).

General Criticism: Even though SAT was and still is a highly-influential theory in linguistics, there has been criticism. Austin himself realized that his first classification into *performatives* and *constatives* was problematic and already adapted it. SAT, as it is known today, is mainly criticized because of its speaker-orientation (little attention is paid to the hearer). Furthermore, the interplay between speaker and hearer is not taken into account and speech acts are only regarded as detached units (in contrast to e.g. discourse analysis). For an overview of SAT key characteristics see Table 1.

Table 1. Speech Act Theories – An overview

Major Publication Years	1953, 1962, 1969, 1979
Name	Speech Act Theory
Major Authors	Wittgenstein, Austin, Searle
Basic Assumptions	Speakers do not only describe circumstances or state facts with an assertion but also perform communicative actions to exert influence on their environment. An assertion is no longer not only judged as true or false but as an action as a whole.
Goals	Speech Act Theory was developed to explain how we use language to accomplish the goals of speech acts.
Major Constructs	Speech acts, illocutionary act
Achievements	Raising the awareness that language is used to perform actions Utterance = Act
General Criticism	Speaker-oriented, little attention to the hearer No descriptions of the interplay between speaker and hearer

2.2 Theory of Communicative Action

Background: The theory of communicative action can be regarded as the main work of the German philosopher Habermas. First published in 1981, it consists of two volumes:

1. Reason and the Rationalization of Society,
2. Lifeword and System: A Critique of Functionalist Reason.

Basic Assumptions and Theoretical Elements: The basic units of the theory are communicative actions. Communicative actions make communication possible by negotiating common definitions of situations. According to Habermas, an ideal speech situation is one in which communicative actions bring about mutual understanding (non-distorted communication). Therefore two general rules have to apply:

1. there is no manipulation involved in the communication and
2. everything communicated is open to question about its validity.

These rules enable the communicative actions to be controlled by speech acts that are evaluated on the basis of better arguments related to four validity claims: that the statement is true with respect to the objective world; that the statement is right with respect to the normative, social world; that the statement is honest in respect to the speaker's subjective world; and that the statement is comprehensible (Habermas 1984).

This stipulation of non-manipulative communication raises two fundamental questions about any communicative situation. The first is the need to distinguish between validity and power. Is a speech act effective because of its validity or is a speech act effective because of the power relationship between speaker and hearer? If the latter is the case then the speech act is no longer authentically oriented to reaching mutual understanding. The second question is whether or not the speech act is strategic, i.e. aimed at achieving a particular interest of the speaker rather than mutual understanding. This distinction between strategic and communicative action is related to the distinction between perlocutionary and illocutionary acts in SAT.

Goals and Achievements: Habermas developed a framework for an ideal speech situation. According to him, language is the normative basic of a society, which enables interpersonal social interaction. He took the ideas of Austin and Searle one step further. Habermas and the Frankfurt School may also be associated with grounding a "critical research" perspective as being highly influential in IS research (Niehaves & Stahl, 2006a).

General Criticism: Habermas' extremely restricted rules for authentic communicative action has led some authors to describe Habermas' theory as utopian and difficult to realize in practice (cf. e.g. Turner, 1991). For an overview of key characteristics of the Theory of Communicative action see Table 2.

Table 2. Theory of Communicative Action – An overview

Major Publication Years	1981
Name	Theory of Communicative Action
Major Authors	Habermas
Basic Assumptions	A speaker makes four implicit validity claims in an utterance. If speakers ignore one of these validity claims then communication can break down.
Goals	Framework for an ideal speech situation
Major Constructs	Introduction of the concept of validity claim. Four basic validity claims are raised in communication: Truth Normative rightness Sincerity Comprehensibility
Achievements	Further development based on SAT
General Criticism	extremely restricted rules, utopian difficult to realize in practice

2.3 Structural Linguistics

Background: Structural linguistics can be traced back to Ferdinand de Saussure and his posthumously published *Cours de linguistique générale* (1916). Following Saussure, other researchers like Trubetzkoy, Jakobson, Bloomfield or Chomsky adopted this school of thought and developed it in different directions (research streams include e.g. Universal Grammar, Generative Grammar, Deep Structures etc.). One of the major improvements for linguistics was the supplementation of the, up to then, prevailing diachronic linguistics.

***Basic Assumptions and Theoretical Elements*:** Structuralism in general is a method, which tries to describe humanistic phenomena (e.g. of linguistics) accurately with principles of natural-sciences.

Structural linguistics is mainly concerned with language as abstract structures or relations governing speech, i.e. language is regarded as a set of rules. Concerning these principles, there is an ongoing debate among linguists, whether language is an internal property (Chomsky 1965) or whether language is a social event which depends heavily on context, social knowledge and interaction. According to Chomsky, all languages have a common structural grammar (Universal Grammar), which explains why the language acquisition of children happens so fast.

***Goals and Achievements*:** There are several linguistic concepts and terms, which were introduced by Saussure, e.g. the distinction between the use of language, i.e. speech (*parole*) and the underlying system of language (*langage*) or the distinction of a linguistic sign in two parts, the *signifier* (actual sound of the word) and the *signified* (the concept or meaning of the word). The reception and further development of structural linguistics marked a decisive shift in linguistics towards a structural and sociological approach.

***General Criticism*:** Structural linguistics often ends up in abstractness and absurdity. It is not always fruitful to copy scientific research methods for humanistic research. Furthermore, only the structure is of interest and not the segmented parts in connection. Table 3 gives an overview of the key characteristics of structural linguistics.

Table 3. Structural Linguistics – An overview

Major Publication Years	1916, since 1960s ongoing
Name	Structural Linguistics (hypernym), Generative Grammar, Universal Grammar (UG), Deep Structures
Major Authors	Chomsky (Generative Grammar) Saussure Trubetzkoy Jakobson Bloomfield (American Structuralism)
Basic Assumptions	Language and speech are separate entities All languages have a common structural basis (UG) and a basic linguistic competence is inherited biologically by all humans
Goals	Especially Chomsky: explanation of language acquisition (children learn language fast because they have an internal common set of structures they can rely on)
Major Constructs	Saussure: Distinction between the use of language, i.e. speech (parole) and the underlying system of language (langue) Linguistic signs consists of two parts: signifier (actual sound of the word) and signified (the concept or meaning of the word) Chomsky: Underlying "Deep Structures"
Achievements	The reception and further development of structural linguistics marked a decisive shift in linguistics towards a structural and sociological approach.
General Criticism	Only structure is of interest Often ends up in abstractness and absurdity

2.4 Linguistic Turn

***Background*:** Logical propedeutic (original title of publication: *Logische Propädeutik – Vorschule des vernünftigen Redens*) was first introduced in 1967 by Kamlah and Lorenzen, who can be regarded as the "grounding fathers" of the Erlangen Constructivism. The logical propedeutic considers itself as piece within the stream of the so-called 'linguistic turn'. The term linguistic turn was coined by (Rorty 1967), when he published a collection

of essays with the title *The linguistic turn – Essays in philosophical method.*

***Basic Assumptions and Theoretical Elements*:** The central point of Kamlah and Lorenzen is the logical construction of scientific language. By means of language one develops ones world as one distinguishes, draws connections, recognizes well-know and assigns unknown to well-known. Language is not a neutral instrument of thought or perception but it is also not restricted by thought. A conceptually acknowledged world is also always a linguistically acknowledged one. The strong connection between language and thought and the question if language influences thought or the other way around had its peak with Sapir and his student Whorf (Whorf 1956) and the so-called Sapir-Whorf-Hypothesis, which states, in line with Humboldt's works, in short, that the nature of a particular language shapes the habitual thoughts of its speakers. This claim has since then engaged a lot of researchers in various fields.

Basic theoretical elements of Kamlah and Lorenzen are predication and language communities. Predication means the assignment of a word to an object. This does only work, if 1. the meaning and 2. the sign is agreed upon in a certain language community.

The logical propedeutic approach is supposed to establish rules, according to which every scientific dialog can be reasonably decided on. Thus, the logical propedeutic is first and foremost a language critical instrument.

***Goals and Achievements*:** The major goal of this school of thought is to provide a sound philosophical basis and directions for a reasonable language use in scientific discourse. Based on the awareness, that language is not only an instrument for communication, there was a major shift in philosophy and epistemology in the 20th century, which is today known as the linguistic turn. Language is no longer only seen as an instrument for communication but it is studied it for its own sake.

***General Criticism*:** Language communities are not easy to operationalize and to measure. The logical propedeutic assumes the existence of a natural language as the basis of building a specific language community. Concerning this matter, the obvious problem is to define when natural ends and specific starts.

Table 4 gives an overview of the key characteristics of the linguistic turn.

Table 4. The Erlangen Constructivism – An overview

Major Publication Year	1967
Name	Erlangen Constructivism, Logical Propedeutic, Linguistic Turn, Pragmatic Turn
Major Authors	Kamlah Lorenzen Rorty (Sapir, Whorf)
Basic Assumptions	Human understanding is inherently depending on language. Language represents a means not only to represent knowledge, but it also shapes the process of achieving knowledge→ Subject has an influence: Interpretivism
Goals	The major goal of this school of thoughts is to provide a sound philosophical basis and directions for a reasonable language use in scientific discourse.
Major Constructs	Language communities, predication
Achievements	Increased turn to the phenomenon "language" Major shift in philosophy and epistemology in the 20th century → awareness, that language is not only an instrument for communication but is studied for its own sake
General-Criticism	Language communities not easy to operationalise and to measure Logical Propedeutic assumes the existence of a natural language as the basis of building a specific language community → when does natural end and specific start?

3 IS Research Adoption of Linguistic Theories

The adoption of linguistic theories lead to different research streams in IS research. Several linguistic theories which had an impact on IS research have been described in the previous section. Since these theories are concerned with different linguistic topics, their implications on and their use in IS research are, consequently, diverse. These implications and applications will be pointed out as follows: Speech Act Theory and building on that later the Theory of Communicative Action (subsection 0). In Section II these two theories were introduced separately in order to grasp their original core statements. However, in IS research, when adopting the the-

ory of communicative action, the SATs basic assumptions are always transferred as well. That is why these two theories are dealt with together in the next subsection. Subsection 0 covers the adoption of structuralism/ structural linguistics in IS research while subsection 0 shows the impact of the linguistic turn.

3.1 Speech Act Theory and Theory of Communicative Action

Intentions behind IS research application: the linguistic theories, originally dealing with natural communication, are used to implement programs, software tools etc., which improve organizational communication. Traditionally, information systems were focused on data management and the communicative function was recognized relatively late. That changed when IS researchers started to have an intensive look on linguistic theories. In the 1980s a new paradigm, the language-action-perspective (LAP) evolved, thanks to the pioneers Winograd and Flores. The focus of the LAP is on the communication aspects in information systems. This is insofar significant, as the major task of an information system is the support of organizational communication. There have been many different applications of the LAP in the last decades but they all agree that language is not only used for presenting information but also to perform actions like orders, promises etc. Thus, the focus is on pragmatics and how language is used to achieve mutual understandings and therefore a better communication. The direct application of SAT and the theory of communicative action in ISR is the support of communication through e.g. groupware systems.

Elements of IS research theory applications: The differentiation of illocutionary acts into assertives, directives, commissives, expressives and directives has been widely used in the IS field (cf. e.g. Winograd a Flores 1986; Auramäki et al. 1992; Schoop 1998).

Habermas' theory of communicative action (1984) is based on the works of Austin and Searle and has also had great impact on IS research. In line with Austin and Searle he regards communication as action. There have been discussions among IS researchers to combine the frameworks of Austin/Searle and Habermas. Several authors regard the theory of communicative action as more sophisticated than speech-act-theory (Dietz a. Widdershoven 1991) while others see it as a further development.

Table 5. Adoption of Speech Act Theory of Communicative Action in IS Research

Major Publication Years	First wave: 1980, 1986 Second wave: 1990s
Name of Theory in IS Research	Language Action Perspective (LAP) Language Action Theories
Major Authors in IS Research	Winograd, Flores, Ludlow, Auramäki, Lehtinen, Lyytinen, Dietz, Widdershoven, Schoop
Field of Application	Communication Support System Computer Supported Cooperative Work Design of information systems with linguistic communication as basis
Differences and Adaptations	Theory of speech acts is used for the development of information systems → support of organization communication Rules of speech are transferred to the development of communication support systems

3.2 Structural Linguistics

Intentions behind IS research application: The concept of deep structures and surface structures has been borrowed from linguistics as a metaphor or analogy to help guide our understanding of IS development in human organizations (Truex 1998).

The debate among linguists, whether language is an internal property or whether language is a social event which depends heavily on context, social knowledge and interaction, was not continued by IS researchers. Instead only the "deep structures" of Chomsky (linguists in the line of Chomsky argue that language arises from an innate linguistic competence with a set of pre-existing mental structures) were adopted (Wand a Weber 1995). The Chomskyan Grammar is one of the five languages views that (Lyytinen 1985) distinguishes in his article about the implications of theories of language in IS.

The problem with structural linguistics as a linguistic theory in IS research or, to be more precise, with Chomsky's so called Universal Grammar (UG) or "deep structures" is, that it became difficult when it was shown that Chomsky himself had abandoned the concept – years before it was introduced to the IS field – because it was widely misunderstood and misused. Today IS researchers propose to "focus on the emergent nature of information systems requirements […], then our values shift toward an

emphasis on maintenance rather than analysis of any imaginary innate structures." (Truex a. Baskerville 1997)

However, concepts from structural linguistics can be very insightful for information systems research because of the many analogies between information system artefacts and human grammar (Truex 1998). "Grammars are constructed to enable efficiency, clarity and richness of written and verbal human expression and communication. Indeed, information systems are constructed for a very similar purpose, although perhaps more consciously and instrumentally." (Truex a. Baskerville 1997)

Table 6. Adoption of Structural Linguistics in IS Research

Major Publication Years	1995, 1998
Name of Theory in IS Research	Structural linguistics, Deep Structures
Major Authors in IS Research	Truex, Baskerville, Wand, Weber
Field of Application	Metaphorical and theoretical basis for theories about organizational information flows and the construction of organizational information systems Application of linguistic theory in the IS field does seem to improve our understanding of how information systems evolve in human organizations (Truex 1998)
Differences and Adaptations	Not the complete theoretical paradigm was borrowed into IS research Post-structuralistic ideas (emergent grammar) challenge structural linguistics in its home discipline and by now also in IS research

3.3 Linguistic Turn

Intentions behind IS research application: The introduction of an explicit language for scientific reasoning. Language is used as a conceptual basis for interpretivist and critical research streams. For a long time the mainstream in IS research has been positivism, still other research streams (interpretivism and social-critical theory (SCT)) gained ground, particularly in Europe (Chen a. Hirschheim 2004; Niehaves a. Stahl 2006b). Interpretivism and social-critical theory reveal the meaningfulness of the social world and therefore support linguistic approaches to IS research. It is argued that "the linguistic turn can encourage the growing acceptance of interpretivism and SCT in IS by influencing the epistemological nature of IS

research to more fully embrace linguistic-based analyses as epistemologically valid."(Monod et al. 2006) The implications of the linguistic turn on IS research have been demonstrated by them using a Kantian epistemological framework to show the implications on the four aspects of research:

- Research issue: The linguistic turn leads to a research issue more focused on language through interpretivism and social-critical theory,
- Objectivation process: more based on understanding than explanation,
- Type of knowledge: tends to be influenced more by a descriptive (from our experience) knowledge rather than a normative (from our reason) one,
- Conditions of possibilities: tend to move from causality to a search for meaning.

In line with Monod et al. (2006), Dreiling states that "Considering the nature of language within IS, one must acknowledge the importance of the researcher (especially her pre- understanding and historicity) during her data interpretation […] The linguistic turn not only impacts at the application level, but also on the methodological level. If the nature of language is considered, then positivist methodological dominance in IS must be questioned." (Dreiling 2007) In addition, (Frank 1999 p 24f.) presents several theses for the language use in IS research, e.g. that established knowledge as well as new research results should be presented in a way that facilitates comparability and visualizes the progress of knowledge. Furthermore, Holten (2003) develops a linguistic-interpretivist approach to conceptual modelling of reporting systems. In alignment with that, Becker and Niehaves (2007) analyse the impact of a linguistic-interpretivist position on conceptual modelling in IS research and advocate the importance of conceptual modelling in IS development.

Besides such direct implications of the linguistic turn all authors agree that the linguistic turn raised the awareness for language and its use in IS research. "The linguistic turn implies that the origin of knowledge is in the language itself. So, a researcher will learn and understand his/her world by studying language artefacts like texts or discourses. Nevertheless, the linguistic turn, which is closely linked to hermeneutics, invites the researcher to adopt a multi-perspective view." (Monod et al. 2006)

Tabelle 7. Adoption of the linguistic turn in IS Research

Major Publication Years	Since 1990s ongoing
Name of Theory in IS Research	Linguistic turn, Erlangen Constructivism, Logical Propedeutic
Major Authors in IS Research	Monod, Pallud, Vance, Alvesson, Kärreman, Frank, Dreiling, Holten, Becker, Niehaves
Field of Application	Conceptual modelling and Information Systems Development Research Methodology
Differences and Adaptations	Linguistic turn for scientific discussions (original purpose) Linguistic turn for IS development (conceptual modelling as means to bridge gaps between e.g. managers and IS developers)

4 Analysis and Discussion

The analysis of the adoption of the above mentioned linguistic theories in IS research is necessary because several of the presented aspects are interrelated. A historical survey of selected influential writings regarding linguistic theories in IS research in form of a time line visualises basic streams of thoughts in the field (Fig. 1)

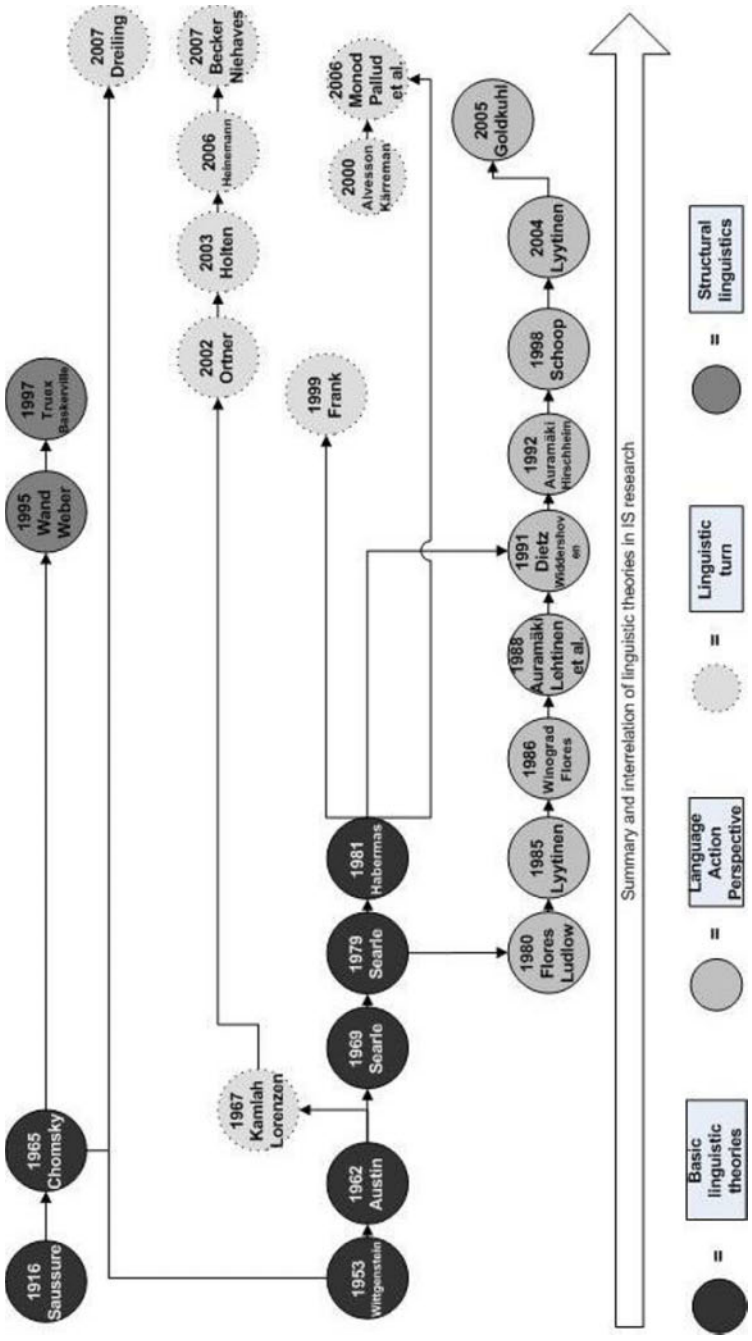

Fig. 1. Time line of linguistic theories in IS research

Some of the previously outlined linguistic theories are interrelated or have the same theoretical foundation respectively. E.g. the LAP is mostly based on Wittgenstein, Austin and Searle, while later on also Habermas is considered (see e.g. Dietz and Widdershoven). In addition, Habermas' theory is also influential for approaches in the scope of the linguistic turn (Frank), where the speech-act-theory is not brought up as well. Frank corresponds amongst others to the theory of communicative action for his argumentation on objectivity and accuracy in scientific language use. However, there are also authors (like Monod et al.) who draw on Wittgenstein, Austin, Searle and Habermas and therefore work with the same theoretical foundation as researchers of the LAP. Dreiling examines the impact of the linguistic turn on research in information systems and considers in his line of argument also Saussure and Chomsky. This leads us to structural linguistics, a research stream that has its own theoretical base (namely Saussure and Chomsky) and apparently only little connection to the other linguistic theories.

Table 8. Language-oriented research streams in IS research

Approach	The Role of Language
1) Philosophical approach	Language itself is the research topic
2) Applied linguistic theories	Linguistic theories are being applied to IS environments

The analysis of language-oriented research in IS research suggests that there are basically two research streams that have "language" as a topic (see Table 8):

1. *Philosophical approach.* There are researchers, who take the language itself as the topic of their research (Alvesson a. Kärreman 2000; Frank 1999; Ortner 1994; Monod et al. 2006). They take the insights and knowledge not only of linguists but also of philosophers (Kamlah a. Lorenzen 1996; Habermas 1984) and translate it into their field of research. The outcome is a sophisticated view on how language influences research (and researchers) and what can be done by researchers in order to make their research language less ambiguous and more straightforward. This research stream can mainly be traced back to the field of the linguistic turn. As Monod et al. (2006) put it: "By employing a linguistic-influenced epistemological methodology, IS researcher can gain significant insights into organizational attitudes and behaviours towards information systems that otherwise would be difficult to obtain. Further, the linguistic turn effectively promotes language itself as an object of study, allowing IS research-

ers to focus on verbal and written artifacts surrounding information systems. Through the lens of the linguistic turn, IS researchers can gain new insights into the complex interplay between organizational and technological phenomena that is information systems" (Monod et al. 2006). Likewise, Heinemann (2006) describes so called *Epistemic Application Systems*, i.e. application systems, which provide *knowledge* in a specific situation but at the same time take the *intend* of the user into account (Heinemann 2006). Her development of a philosophy of science combines a lot of the above mentioned topics and can serve as a good introduction and overview for students and researchers, who are interested in this field.

Research in the field of structural linguistics can also be subsumed under *philosophical approaches* because here also the language itself is the research topic (see e.g. Truex a. Baskerville 1997).

2. *Applied linguistic theories.* The second research stream comprehends IS research, which actually applies linguistic theories to IS topics (Auramäki et al. 1992; Flores a. Ludlow 1980; Schoop 1998; Lyytinen 2004; Dietz a. Widdershoven 1991; Dietz 2004; Auramäki et al. 1988; Alvesson a. Kärreman 2000; Benoit 2001). In this field of research e.g. the LAP arose and it can therefore be traced back to the SAT and the Theory of Communicative Action.

The initial application of the SAT in IS was "The Coordinator" by (Winograd a. Flores 1986), a conversational system intended to be used for communication in sales, finance, general management etc. in organizations of a variety of sizes and types (Winograd 1987). In contrast to "The Coordinator", which is an actual piece of software, systems like DEMO (Dietz 1994) or SAMPO "Speech Act-based Office Modelling Approach" (Auramäki et al. 1988) provide a means for diagramming and modelling business processes according to the conversation that occur during those processes. SAMPO "interprets information systems as social, linguistic systems for communication between people to support their action" (Auramäki et al. 1988). One of the latest approaches based on SAT is the development of the *Negoisst* by (Schoop et al. 2003), which automates the negotiation process.

Although the LAP has made significant progress in developing not only theories of information systems but also new modelling approaches and tools (e.g. The Coordinator, SAMPO, DEMO, Negoisst) or new computer based coordination tools it has not become part of the mainstream (Lyytinen 2004). Lyytinen gives a comprehensive overview over the history of LAP and states reasons for its insignificance in IS research, namely that LAP solutions have no demonstrated value that significantly changes the behaviours of designers or computer users at the level of tools and capa-

bilities; that they also face the additional trouble that they are many times *original* and in this sense *radical* innovations that significantly depart from traditional thinking patterns of IS professionals and computer users and that the community i.e. the network of the LAP is too small (Lyytinen 2004 p 10f.). He suggests looking for significant economic benefits of LAP related ideas, to focus on a few areas in which LAP related solutions can be developed to demonstrate user value and to build a greater network for a better acceptance of LAP oriented solutions in mainstream IS research. Concerning this matter, there is hope for further developments of the LAP. In contrast to the "conventional" LAP approaches, one recent approach based on SAT is the development of a method for creating profiles of communications after the business conversations (free-flowing natural language conversation as in instant messaging or emails) take place (Twitchell et al. 2004). This new approach shows that the LAP is not yet forgotten and that it can still offer new and important insights.

Based on Habermas' theory but not in the scope of the LAP, Benoit comes to the conclusion that "some aspects of human-human information seeking interaction do significantly influence meaning construction. If these results were adopted into system design, they could serve as a via media between human-human models and deterministic human-computer ones. […] The four themes […] that Habermas describes (truth, truthfulness, comprehensibility, and normative right) can be successfully integrated into an actual information system" (Benoit 2001). Benoit's approach shows, that there are various possible applications of linguistic theories even though his approach is more related to communication than actual language use.

5 Conclusions and Further Research

A review of language-oriented theories in IS research has major implications for IS research practice. The turning to linguistic theories and the awareness that language is action, that language is used for the coordination of actions on the one side and that a straightforward and clear scientific language is necessary on the other side already lead to a fruitful examination of the possible applications of linguistic theories in IS research. As shown, linguistics is an important reference discipline for IS and many researchers engage in adopting specific theories, methods and insights of linguistics and language philosophy into their field of research. Analyzing the literature dealing with language, it becomes obvious that the bigger part of language-oriented research in IS originates from IS researchers

(meaning that they are either working at an IS institution and/or that they do regular research on core IS topics, such as IS development). Correspondingly, only a few linguists are concerned with the fact that their theories are being adopted and turn out to be very useful in a discipline such as IS research e.g. (Connolly a. Pemberton 1996). For future endeavours, it would be rewarding to have more linguists joining in the IS discussion on language in favour of a pluralisation of perspectives. Here, further linguistic theories might potentially be identified which could be useful in IS research. Especially in the field of communication modelling, linguistic theories such as discourse analysis (see e.g. Alvarez 2002) or conversation analysis can also offer fruitful insights for IS researchers.

Concerning the linguistic turn, the practical implication for IS researchers is the conscious handling of a clear and precise language in science. A raising awareness of this necessity would lead to less misunderstanding and less redundancy in scientific writings and therefore to better quality and a higher standard. As for the structural linguistics and the Universal Grammar or deep structures respectively, there are several possible fields of application. Although the original theory of a Universal Grammar was abandoned by Chomsky himself, some aspects of deep structures, i.e. universal grammatical features, which are common in all languages, could be helpful in the development of language-based tools since these basic structures are fixed and can be useful for software implementation.

However, future research is necessary. Possible aspects might address other linguistic or language-oriented theories. Furthermore, the gained knowledge has to be tested and advanced in further applications.

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