Research paradigms in psycholinguistics

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While writing in psycholinguistics is similar to that of the other social sciences, the unique nature of psycholinguistic research lends itself to different styles of writing and argumentation, depending on the particular subfield. Unlike theoretical linguistics, where papers depend on abstract theoretical arguments based on linguistic theories and data supplied by the researchers, psycholinguistics papers depend on research experiments and data, and conclusions or theoretical arguments based on the research results.

The early work in psycholinguistics, beginning in the 1960’s, was quite theoretical, as researchers were concerned with psychological investigations and applications of Chomsky’s linguistic theories, or finding empirical evidence to support the theoretical claims of Chomsky and others in this linguistic paradigm. For example, researchers studied the progression of child language, such as its syntactic and phonological development, for more insight into the abstract structure of language and child psychological development. Also, researchers in this line of work have attempted to develop psychologically and biologically based explanations for the phenomena found in language development, e.g., neurological explanations for the “critical period” (the time period when children can learn a language naturally from their environment). Thus, the research involved empirical data, but the main emphasis of published writing was in theoretical argumentation or explanation of the data, since the ultimate goal was verification or elaboration of linguistic theory.

Similar research continues today, though not always motivated by Chomskyan linguistics, in the major research areas of language acquisition – either first language acquisition (how children learn their native language) or second language acquisition among adults learning a foreign language. Such research is often motivated by theories of language learning in linguistics, or by purely psychological theories. In such research, the classical research model is generally followed: a control group that receives a standard treatment, i.e., normal conditions or learning environments; and an experimental group that receives a different treatment, learning situation, or teaching technique, which the researcher is interested in. For example, Richards (1995) compares two groups of adults learning English as a second language under two types of teaching conditions, and based on differing results on their learning between the two groups, he argues for one teaching method over another. Fisher (1998) examines how young American children learn the grammar of English verbs by comparing a normal control group with a group that undergoes a different learning situation disguised as a play activity. Based on the results, she argues in favor of a theoretical view of language known as Construction Grammar (Goldberg 1996) and how it better explains how children learn verbs better than other existing theories. Such research shows the special difficulties of psychological research with children, which require clever and creative experiments to elicit reliable data, and which must effectively control for different possible factors that may influence the results. One may wish to examine poorly done research in
language acquisition, such as Tomasello (1992, 1996, 1998), where other factors are not well controlled for, and the theoretical arguments fail to be convincing because he fails to adequately address alternative explanations besides his own for the data, or weaknesses of his interpretation and hypothesis. Depending on the researcher’s specific interests, the research writing may be focused more on empirical findings themselves, or the theories that they may support, or practical implications thereof, e.g., for teaching English as a second language.

A popular line of research consists of brainwave experiments, in which subjects’ brain activity is measured while processing language, either directly by means of electrodes on the head or MRI scans, or indirectly by eye tracking experiments that record eye movements. Researchers attempt to deduce how and where certain aspects of language are stored or processed in the brain. For example, Garnsey (1996, 1998) uses eye tracking and MRI to argue for a parallel processing model of language, and against more traditional models. The experimental setup and methods are described, and the results reported and discussed. Based on her interpretation of the data, she compares two competing models, and argues in favor of the parallel model. Thus, the argumentation is largely data driven and empirically driven, and is often based on comparison and evaluation of competing models, showing one to be a superior hypothesis in that it better explains the data.

A more recent and related line of research lies in connectionism, i.e., models of neural processing based on mathematically and neurologically inspired models of parallel brain processing, and how language is stored and processed in such models. Unlike typical psycholinguistic research, such work often consists of computer simulations of neural and mental activity. The success of failure of a simulation serves as the basis for the researcher’s argumentation in favor of a particular connectionist model of language or psychological perception, e.g., the landmark research by Rumelhardt and McClelland (1996) in simulating the English past tense. Some such research, however, may involve human subjects, such as Dell’s (1997) research on speech errors, in which he elicits speech errors from subjects, and based on patterns found in the errors, he argues in favor of a different connectionist model and against that of Rumelhardt and McClelland. The researcher may be more concerned with a specific hypothesis or model, rather than a more general theory.
Since academic papers in psycholinguistics are quantitative and experimental, they follow the standard format of experimental papers. The introduction provides direct background information on the topic, leading to a statement of the main point of the paper, e.g.,

Three experiments presented in this paper show that character recognition involves simultaneous processing of phonological and semantic information, depending on the relative strength of these factors for a given character.

A literature review then follows, critiquing relevant experimental studies, and assessing their positive contributions and limitations. This is generally done in the past tense for describing studies, and present tense for summarizing accepted facts, conclusions and theories. More relevant and recent studies may be framed in the perfect tense, particularly when these studies provide the rationale for the current author’s study. The current study may be based on the previous study, either as a replication study, or to directly address limitations that the author has identified:

The Smith and Jones study has shown that ... However, how this would apply to processing bivalent Chinese semantic character components remains unclear. The following experiments will address this limitation. (Nerf, 2011: 36)

Spackle’s (2010) study has reported that ..., but failed to consider the bivalent nature of these characters. The following experiments will address this limitation. (Herder, 2012: 145)

The literature review leads into the author’s particular experiment to be reported, often by stating their research hypotheses, what they expect to find, and a brief description of the type of experiment to follow. The type of experiment is often referred to as a ‘research paradigm’ in psychology (not to be confused with ‘paradigm’ in the sense of academic fields and academic modes of thought, as in the preceding section). Typical types of experiments that one might see are behavioral experiments, i.e., lab experiments with human subjects performing tasks; reaction time experiments, which are behavioral experiments where subjects’ responses are timed and studied; neuroimaging experiments; eyetracking experiments; and less commonly, quantitative survey experiments.

The next section is the experimental section, which describes in great detail how the experiment was done. This is necessary, in case other researchers wish to replicate the experiment. This begins with a section introduction, often providing the rationale and a more detailed description of the experiment. Subsections follow with specific information, following the style of experimental psychology experiments. These subsections generally include: participants (who, how they were recruited, and standard IRB statements); materials used; procedures (how it was carried out, what the subjects did); and results – the raw statistical results. Generally, two groups are compared – a control group and a target or experimental group. These are generally counterbalanced for statistical reliability, though in some social psychology experiments, this may not be possible, and some experiments might also involve repeated measures designs. Based on the raw statistical results, the researchers
conclude whether particular factors were statistically significant.

This is followed by the main general discussion section. This often begins with a summary of the results, and the factors that were significant or not significant. The researchers explain how this confirms, or partially confirms (or maybe disconfirms), their research hypotheses. The meaning of this is discussed in relation to issues raised in the literature review, and ongoing questions in the field that the study is designed to answer. One has to explain and interpret the results in light of current theories and questions, showing what their results mean for theories, models, or controversies. They also previous research, and how the current study may provide better results than past studies. They may have to explain why their findings are better if they contradict past studies or models. Basically, various implications of the study for the field are discussed, and the current research must also be defended against possible criticisms, objections, or controversies. At the end of this section, or in the conclusion, the writers briefly summarize the main implications, and perhaps hedge themselves by stating possible limitations. They also identify outstanding questions, and ideas for further research; e.g.:

Although this study controlled for lexical and phonological frequencies, it is possible that this may not be generalizable to subjects who did not learn with a phoneme-based pedagogical spelling system in some parts of their home country. More research is needed with such speakers to assess whether this learning effect affects our results, or whether the phonological frequency effects observed here are true of all speakers, regardless of educational background. We hope to address this in an on-going follow-up study. (Snerd 2009: 874

Sources are used most in the literature review, where they are cited in a very dense, dry and concise manner, to provide a comprehensive overview of the issues and psycholinguists’ current knowledge, as well as to provide a specific rationale for the current experiment. The general discussion also contains a number of references, as one must interpret one’s findings in light of other research and models. The introduction may have a few references to frame the issue, and the experimental section may cite a few sources regarding the experimental design or less common statistical analysis methods. Of course, parenthetical in-text APA citations are used, and the references section follows rather strict APA format, as the psycholinguistics journals follow the current APA style just as exactly as the standard psychology journals do.

Since psycholinguistics research is based largely on experimental psychology, the writing style is dense. A typical reader needs to be familiar with basic theories and models in the field, such as connectionism, schema theory, reading psychology, and theories of language acquisition, as well as a good familiarity with cognitive psychology and subfields of linguistics, and with the more common fields and approaches in theoretical linguistics, such as generative linguistics, Optimality Theory, and cognitive linguistics.

As mentioned, the language is fairly dense and scientific. Present and past tense are primarily used, with perfect tense for discussing recent studies in developing the rationale for one’s study, or, e.g., in explaining the relevance of one’s findings in the discussion section (“our findings have shown that X is the case”). Noun antecedents are referred to with a mixture of demonstrative pronouns, occasional paraphrases (e.g., “this proposal” = a preceding sentence), and repeated nouns. The literature review and discussion sections may contain a number of transitional expressions for contrast, comparison, cause and effect. These
sections tend to have more complex and longer sentences.

More importantly is the ability to offer careful and nuanced analyses of one's results. One must be careful not to overstate or overgeneralize one's results, and one has to think carefully through the possible relevant or implications of one's results for differing models, theories, and viewpoints. For example, in reading psychology experiments, one may have to carefully consider the implications of connectionist, single-route and dual-route models, and whether one's results really fit with or go against the specific implications of these models for one's data. This can be abstract, technical, and difficult, and can be difficult to write up in a clear, coherent, and precise manner. This requires careful thought and analysis, especially if one wants to publish research in leading journals.

References

Note: Dates in this sample paper may be fictitious, though the researchers referred to are real.
1. [APA reference #1]
2. [APA reference #2]
3. [APA reference #3]
4. [APA reference #4]