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Is Cognitive Science Interdisciplinary?: Past and Present Perspectives

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The field of cognitive science is by origin and perhaps by definition an interdisciplinary field. However, it is unclear to what extent truly interdisciplinary work occurs in cognitive science. That is, is cognitive science merely a collection of researchers from different disciplines working separately on common problems? More specifically, does the work presented and published in cognitive science journals and conferences use methods from multiple disciplines? Does the work refer to results and previous work from multiple disciplines? Do researchers from different disciplines work together on projects? Furthermore, does cognitive science really include work from artificial intelligence, linguistics, neuroscience, philosophy, and psychology, as the journal *Cognitive Science's* subtitle leads one to believe?

To address these questions we focused on three sources of data. First, we gathered data on the backgrounds of participants of the last two Annual Meetings of the Cognitive Science Society (cf., Schunn, Okada & Crowley, 1995). This data suggested that 1) the conference is dominated by cognitive psychology and computer science researchers, but 2) that a majority of the multi-author papers involved interdisciplinary collaborations (i.e., had authors from different disciplines). Further, the interdisciplinary collaborations were more likely to involve equal status working relationships (independent of actual professional status differences) than intradisciplinary collaborations (cf., Okada, Crowley, Schunn & Miwa, 1996; Okada, Schunn, Crowley, Oshima, Miwa, Aoki, & Ishida, 1995).

A second source of data was the content of papers published in the journal *Cognitive Science* and in the *Proceedings of the Annual Meeting of the Cognitive Science Society*. We focused on the prevalence of methods from the two prevailing disciplines in cognitive science: psychology and artificial intelligence. In particular, we analyzed the prevalence of papers reporting experiments, simulations (but not of any particular data), simulations of data, both simulations and experiments, and neither simulations nor experiments. Over the history of the Cognitive Science Society, we found an early rise in the prevalence of papers reporting simulations, and later rise in the prevalence of papers reporting simulations of data and papers reporting both experiments and simulations. However, even in 1995, the papers that were interdisciplinary in content accounted for only a third of all papers.

A third source of data was the references listed in the papers published in the journal *Cognitive Science*. All the references listed in each paper were coded into discipline categories. Preliminary analyses suggest that the patterns of change across time mirrored the results of the content analyses: we find a rise over time in the number of papers with significant referencing of multiple disciplines. However, the great majority of references were to sources from psychology and artificial intelligence, with few linguistics references and very few philosophy and neuroscience references, areas which are supposed to be equal partners in cognitive science.

Overall, these findings suggest that the glass is both half-full and half-empty: cognitive science has a significant interdisciplinary component, yet it is far from entirely interdisciplinary. In particular, work from cognitive psychology and artificial intelligence dominate, and there are still many papers published in cognitive science that do not involve interdisciplinary work.

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