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2003 Program
Small Business Technology Transfer
(1-year project)

Project Title: Web-based egocentric network tool for visualizing social influences on smoking behavior

Project Summary: This study was designed to determine whether it is feasible to develop a web-based personal network intervention for adolescent smokers. This research pertains to tobacco-related disease because it is widely recognized that social influences are the primary factor in adolescent experimentation with smoking. Previous attempts to design interventions focused on social influence have not been successful. This approach is far more personalized and yet anonymous in the delivery of a social influence intervention. The funds were used to develop a beta version of the software and test it on a sample of 100 college students, 50 smokers and 50 non-smokers. Respondents participated in a more rigorous personal network data collection using an existing program developed by the research team called EgoNet. The compositional and structural differences were compared by deploying this over the internet using dynamic visualization as an interface. There were, as expected, significant structural differences between the two modes; however respondents reacted very favorably to using the interface over the web and commented about the potential value of using network visualization as a tool for an intervention. Based on these results the research team has applied for NIH funding to develop a smoking intervention tool.

Project Successes: There were two main outcomes for this research. The tangible outcome was the development of a beta version of software tentatively called EgoWeb. This a programming language designed to collect, analyze, and most importantly, visualize a personal network over the web. The key advancement of this software over the previous version (EgoNet) is that the network visualization is dynamic, recalculating each time as the respondent enters data. It also uses a visual technique for respondents to evaluate the potential ties between their network members (alters), cutting in half the time it takes for network alter elicitation and structural data collection. While this program was tested on smokers regarding their smoking, it was designed to be general in nature so that it can be used for many interventions. The program was successful and is now being reprogrammed using lessons learned from this study. We discovered significant mode effects using dynamic visualization that must be accounted for in any future interventions.

The other result from this study was a set of data on smokers versus non-smokers. There is evidence from these data (combined with another data set) that smoking causes structural differences in the personal network of smokers. The personal network of smokers exhibits significantly less bridging than those of non-smokers. Recent research supports the notion that in many circumstances, bridging in networks is strongly associated with creativity and economic success.

Presentations from BRP funded research:

McCarty C. *Visualization of Personal Networks.* Portorož, Slovenia: 2004 SUNBELT XXIV International Sunbelt Social Network Conference; May, 2004.