

The Science of Cell Phone Use: Its Past, Present, and Future

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ABSTRACT

Cell phones are becoming the most ubiquitous technology. Researchers in various other disciplines in behavioral sciences have been extensively examining how people use cell phones and what influences cell phone use have on people's lives for more than 20 years. This review paper provides an overall picture of the science of cell phone use by sketching the past, present, and future of this emerged field of study. After a short introduction, it presents an overview of the literature search methods used in this study and a brief history of the science of cell phone use, provides a detailed review of five major areas and six specific topics of the field, and ends with an outline of future directions of research.

Keywords: Cell Phone, Education, Medicine, Mobile, Social

INTRODUCTION

Cell phones are becoming the most ubiquitous technology in the human history. Different from telephones, televisions, computers, or Internet, for the first time in the history, almost each and every of individuals ranging from young children to elderly seniors will use or have one in their daily lives. For more than 20 years, researchers in ergonomics, medicine, sociology, education, psychology, and various other disciplines have been extensively examining how people use cell phones and what influences cell phone use have on people's lives. Thus, it is timely and important to have a systematic

review of how much research literature exists and what the current scientific knowledge is in the area of the science of cell phone use.

This review paper, as the first of a series of planned review papers, attempts to provide an overall picture of the science of cell phone use by sketching the past, present, and future of this emerged field of study. Specifically, it starts with an overview of the literature search methods used in this study and a brief history of the science of cell phone use, then provides a detailed review of five major areas and six specific topics of the field with selected research examples, and ends with an outline of future directions of research.

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METHOD

Literature Search Strategies

We used multiple strategies to search the existing literature. These strategies included database search, dialog search with librarians, manual search of references of identified articles, and consultation with identified experts. In particular, 19 databases were searched, including PsycINFO, PubMed, Science Direct, Pubget, Scopus, Applied Science & Technology, Communication, Computers & Applied Sciences Complete, Education Full Text, Education Research Complete, Educational Administration Abstracts, ERIC, Film & Television Literature Index, Health Source - Consumer Edition, Health Source: Nursing/Academic Edition, Humanities Full Text, Humanities International Complete, Psychology and Behavioral Sciences Collection, and Social Sciences Abstracts. Key words such as cell phone use, mobile phone use, cellular phone use, smartphone use, iPhone use, behavior, and behavioral science were searched in different variations and combinations. In addition, we also conducted a dialog search with senior university librarians to confirm our searching results and contacted leading experts for their guidance and consultation.

Exclusion and Inclusion Criteria

We used several exclusion and inclusion criteria to select publications that we have identified concerning the science of cell phone use for further review.

First, we included articles that involve cellular phone, mobile phone, hand phone, basic phones, and smartphones but excluded those that deal with landline phones, cordless phones, car phones, and radio phones (Donner, 2008).

Second, we included articles that directly examine cell phone use but excluded those concerning cell phone design or development. This is because our focus is on the human side rather than the technical side of cell phones.

Third, we included articles that examine cell phone use from a wide variety of disciplines in behavioral sciences but excluded those primarily examining cell phones from the perspectives of computer science, electronics engineering, commerce, industry, and management. We are interested in articles that can provide empirical evidence and/or theoretical thinking regarding elements, patterns, processes, effects, mechanisms, factors, and domains, of cell phone use.

The Final Size of the Literature

Our literature search generated a total of 3305 publications from 1991 to 2013 that explicitly examined the use of cell phones across various disciplines in behavioral sciences, such as medicine, education, psychology, sociology, political science, and business.

THE PAST OF THE SCIENCE OF CELL PHONE USE

Cell Phones

Cell phone has multiple similar names, such as cellular phone, mobile phone, hand phone, basic phones, smartphones, iPhones, and satellite phones. These different names focus on different features of cell phone and in general can be used interchangeably. However, cell phone should not be confused with cordless phone (used in a small area such as a house without connecting with large networks), car phones or radio phones (used by soldiers, policemen, taxi drivers, doctors, and other professionals with a large antenna, too large not for pocket, too heavy to be held with hands, with early products starting in 1920s). Thus, a typical modern cell phone has at least two key features: (1) It is small for ordinary users to carry with them to anywhere and call anytime (thus distinguishing from a car phone or a radio phone). (2) It is connected to large cellular networks (thus distinguishing from a landline phone or a cordless phone).

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