

## BASIC PRINCIPLES OF CONDUCTING PSYCHOLOGICAL EXPERIMENTS THROUGH THE INTERNET

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### ABSTRACT

The Internet has become an inherent part of its users lives. More and more activities are performed through it and that is why conducting research in this subject is increasingly common. This article discusses issues related to conducting experimental psychological researches through the Internet. The first part of the article shows the dynamics of the Internet's growth as a research area. Next, you will be introduced to the basic rules of conducting methodologically correct experiments using the Internet. The article ends with a description of several psychological experiments conducted in a virtual environment and is followed by an analysis of advantages and disadvantages of the method.

**Keywords:** experiment, Internet, psychology, methodology.

### INTRODUCTION

The Internet, like no other device before, has undergone a very intense transformation throughout last two decades. Out of numerous devices designed for mankind, the Internet has evolved from being a minor help in a work place to being one of the most essential tools, inherently built into the functioning of its users lives. Nowadays it is very hard to imagine (or rather recall) times in which people lived without access to the Internet. With its help, we search through a variety of information, perform our work through it and nurture our relationships.

Wojciech Orliński (2013) emphasizes that the Internet has become a kind of a public benefit - the same as electricity, gas or water. The Internet also affects our - broadly defined - social environment. Due to the fact that people often do shopping over the Internet, and more and more music CDs and books are distributed electronically, bookstores and music stores are gradually vanishing. It has not been long since the Internet's inception, yet we have already started to look at the world around us through "Internet glasses". Google actually marketed authentic glasses - known as "Google Glasses" - by which we can connect to the Internet ubiquitously even without picking up our phones. The latest news and alerts from social networking sites will be automatically displayed right before our eyes. This invention may seem controversial, but we cannot deny Google the fact that once again, they breached another barrier of human- technology interaction.

Manuel Castells (2011) argues that the digital revolution that spreads all over the globe will have even more significant influence on our lives, than was the industrial revolution in the 19th century. The ability to quickly verify a topic in the online encyclopedia or instant write-off for an e-mail are so comfortable that we are allowing the Web to encroach into our lives almost without any rational control.

### THE INTERNET AS AN ENVIRONMENT OF CONSTANT CHANGE

In the analysis of an intellectual climate in the social sciences and humanities in relation to the Internet, we can distinguish three eras. The first era lasted from early nineties to about the year of 2002, and was a time in which the perception of the newly formed Internet was quite pessimistic (Bargh, & McKenna, 2000). The Internet was regarded as one of the tools (concerned as equal to other media) which - mainly by the impact of anonymity - would have a destructive influence on social relationships and overall would decrease the quality of the Internet users lives. Robert Kraut, Michael Patterson, Vicki Lundmark, Sara Kiesler, Tridas Mukopadhyay and William Scherlis (1998) found that Internet use is associated with mental well-being of its users. The more time novice users spend on the Web, the stronger become symptoms of depression, stress and sense of social isolation they feel. This research also showed that the main factors causing such negative effects was the failure to use this tool effectively and also - its technical specifics.

Already in 1996, Kimberly Young developed the first test for diagnosing Internet addiction and in 2011 a Polish adaptation was created by Ryszard Poprawa. Fifteen years ago, psychological research on the subject was focused mainly on its clinical aspects (Childress, & Asamen, 1998). The second period highlighted in the history of the Internet, refers to the social networking sites (Levinson, 2010). Since the inception of sites like MySpace (2003), Facebook (2004) or YouTube (2005) the specificity of the relationship in the Internet has dramatically changed. More or less since then we can talk about the emergence of a phenomenon that researchers call the Internet "Web 2.0" (Levinson, 2010).

Today we are dealing with another wave of pessimism, related to what the Internet really gives us and what it takes in return. A journalist, Nicholas Carr (2012), draws our attention to the fact that the various facilities that we have in our possession thanks to the Internet, have a destructive impact on the whole cognitive system - above all on the ability to focus attention and memory. If we can store data "in the cloud" and at the same time be aware of its continuous availability, we are not forced and challenged to use and exercise our memory. Manfred Spitzer (2013) calls it "digital dementia", emphasizing the particularly bad role that the Internet and new media can have on the youngest children, growing up with new devices without adequate knowledge. A new era of the Internet development is also closely bound up with the dynamic development of the mobile Internet, accessible via smartphones and tablets practically anywhere on Earth. This has an important psychological effect, because at any point we can pick up an e-mail from work or find out the latest news on our Facebook friends. We are never alone with our thoughts and we can be reached by incoming information from all around the world at any time,

Nevertheless, the Internet is a great tool, which allows us to conduct valuable experimental studies. Along with the technical capabilities that the Internet brings with itself, it becomes a challenge for modern humanities, including psychology. A team of psychologists in the first years of XXI century, noted that the examination of the impact that the Internet has on its users will be one of the most important tasks for modern psychology (Sassenberg, Boos, Postmes, & Reips, 2003). Some researchers point to the phenomenon of “digital change” in the humanities, “which introduces new methods, tools, and ways of scientific work for efficient use of the world of digital data, interfaces, software and visualization” (Celiński, 2013, p 13)<sup>1</sup>. The Internet gives scientists previously non-existent methods and possibilities in terms of conducting research. John Shaughnessy, Eugene Zechmeister and Jeanne Zechmeister (2002) note that “access to the Internet has become an indispensable tool for those who conduct research in the field of psychology” (p. 496). The number of researches investigating the Internet effects grows (such as: Aboujaoude, 2012; Carr, 2012; Spitzer, 2013).

The main focus of this article concentrates on the presentation of methods used by psychologists to conduct experimental research via the Internet. Due to the fact that the environment of the Internet is in very rapid change, I focus only on the most recent texts, presenting the use of the Internet in its current form.

### PSYCHOLOGICAL EXPERIMENTS ON THE INTERNET

Before moving on to the experimental studies, we should begin with a brief description of a correlative study, that has been conducted via the Internet for a much longer period of time - almost since the very beginning of the Internet mass dissemination. Experiments conducted over the Internet are often based on the same or similar technical solutions. Quantitative methods seek to identify specific numerical parameters characterizing the phenomenon or object of study. In psychology, they are frequently implemented using a variety of questionnaires, surveys or scales. Psychologists also distribute psychological questionnaires via the Internet. However, we cannot forget that not every existing questionnaire can be used in this manner. When we are filling the questionnaire via the Internet it could be a different situation than when we are doing it with a use of pen and a piece of paper. This factor may be an important disturbance variable. There are special websites for constructing surveys or questionnaires on a wide scale. There are both free services (such as Google Drive) as well as charged (eg. Survey Monkey or Survey Gizmo). By creating an account on one of these sites, we can prepare a list of questions that we want our respondents to answer. The type of questions can be freely modified - from open-ended questions, through the various types of closed questions, to the so-called “sliders” or “thermometer of emotions”, on which subjects mark their emotional attitude towards a phenomenon. Participation in a survey conducted by the Internet also provides a much greater anonymity than in a study carried out in the psychological laboratory.

The tools for conducting quantitative research can also be used with great success for the construction of psychological experiments. Jerzy Brzeziński (2008) says

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<sup>1</sup> All citations from Polish articles and books were made by author of this chapter.

that experiment is a “test that allows the manipulation of the principal independent variable, controlling independent variables and measurement of the variation of the dependent variable due to (...) the action on the main independent variable” (p. 51). As J. Shaughnessy, E. Zechmeister and J. Zechmeister note, “the researchers conducted experiments to test hypotheses about the causes of behavior. The experiments allow researchers to make decisions about what influence or program effectively changes the behavior” (2002, p. 226). But in order to do this, we have to remember the key factor, which is a basic requirement in experimental randomization, defined as “the random assignment of individuals to comparison groups (...), in other words, the random determination of the main independent variable for each of the subjects” (Brzeziński, 2008, p. 48). In order to check whether some factor (independent variable) affects the phenomenon or problem (the dependent variable), we have to have a comparison between the group in which there has been the introduction of the independent variable and the group in which the independent variable is not introduced. One of the key conditions is also a criterion of randomness allocation - failing that we are dealing with a quasi-experiment (Shaughnessy et al., 2002).

Some of the services available over the Internet to conduct research (including the already mentioned Survey Gizmo and Survey Monkey, but also many others) make it possible to program an appropriate randomization procedure. Thanks to this, somebody who enters the web page to take part in the experiment is automatically and randomly assigned to one of the research groups. It will appear to him in slightly different content from another person, assigned to the next equivalent group. It is also important that the procedure of randomization should work in such a way as to ensure equal probability assignment to one of the groups. If the test consists, for example, of three experimental groups (each one with a different manipulation) and one control group, the probability of each test assignment to one of four groups should be 25 percent. Configuration options for experimental conditions are now quite large and allow us to prepare a number of variants of the same study, differing on several levels, which corresponds to several experimental groups. The inclusion of this condition is the basic requirement of methodological correctness of experimental tests carried out via the Internet.

One of the biggest advantages of conducting research via the Internet is its global reach. It is an invaluable feature for the conduct of cross-cultural or simply large-scale research, where the goal is to collect data from thousands of people from many countries. Yolanda Suarez-Balcazar, Fabricio Balcazar and Tina Taylor-Ritzler (2009) pay attention to this aspect, mentioning the opportunities created by the Internet in conducting research on populations culturally divided. The Internet is also helpful in gathering information from persons who are an ethnic minority in a country or region (Suarez-Balcazar, Balcazar, & Taylor-Ritzler, 2009). Most respondents coming from such groups may have difficulties in an adequate expression of their opinions through traditional research methods, such as in-depth interviews or participation in a paper survey. An opportunity to join in a psychological research via the Internet gives them a chance to openly express their minds.

Thanks to conducting an experiment on the Internet, we have a chance to eliminate the fear of judgment and other confounding variables that may arise in the

research conducted in traditional circumstances. John Bailey, Michael Wallace and Bradley Wright (2013) conducted an experiment – via an online survey – where they checked the level of discrimination of homosexuals among hypothetical employers for those people. The survey was sent to employers in four major U.S. cities. It turned out that there is no empirical evidence to support the appearance of discrimination towards homosexual people by the employers during a job interview. The authors emphasize that the conduct of such a study, for this type of intimate topic, could be much more difficult or even impossible in a route other than via the Internet. It is worth noting that this type of study conducted in countries with a lower level of tolerance towards gay people than in the United States, could provide even more interesting data.

Accusations which can be made against all experiments conducted by the Internet is the inability to control the interfering independent variables, that is – in some cases - the conditions in which a person is involved in the experiment. Although the experimental procedure will be identical, passing through it, for example, at home will mean leaving the individual in an uncontrolled situation (much less than in the psychological laboratory where the test is usually performance of tasks in relative peace and quiet). Participation in the experiment via the Internet is also an important obstacle in the context of the requirement of standardization, which provides for all tests under identical initial conditions for participation in the study.

Being aware of all these drawbacks and risks, Robert Ryan, Mara Wilde and Samantha Crist (2013) compared two experiments - one conducted in the laboratory and the other one through the website. The experiments had identical procedures: individuals were presented images of insects and then measured the level of fear and loathing of the respondents. The base study (without the use of Internet) involved 180 people, and the study conducted via the Internet had 1301 respondents. The results were very similar to each other, but in the online survey additional, statistically significant interaction was obtained between sex and fear and disgust. R. Ryan, M. Wilde and S. Crist (2013) conclude in a summary of their research, that the benefits which can be achieved with a research study on the Internet (for example: much larger and more representative sample of respondents) outweighs the potential costs and troubles.

The Internet can also serve as a re-verification tool for previously obtained results of research and be a way to verify an already tested experimental hypothesis. Michael Rosander and Oskar Eriksson (2012) conducted a study in which they wanted to verify the level of conformity of behavior of Internet users. They assumed that with an increase in difficulty of the tasks, the individuals answers would be more dependent on another participants responses. For this purpose, they designed a quasi- experimental manipulation in which they skipped the condition of randomization, due to the process of recruitment. The study involved 926 people, associated with online communities, such as thematic pages on a healthy lifestyle, computer games and other discussion forums, where discussion revolves around a precise topic. That way of recruiting for the research provided a number of people demonstrating the feeling of belonging to the their group – these groups (Internet communities) are often governed by the same laws that

apply in the non-virtual world (for example: McKenna, & Green, 2002; Amichai-Hamburger, 2005).

M. Rosander and O. Eriksson (2012) created a survey distributed via the Internet, in which subjects were assigned to one of two groups - experimental (conformist) and control. The difference was that in the conformist group the questions (eg, "In which city is Hollywood?" and five options to choose from) had an additional, previously prepared by researchers diagram showing the supposed answer to the same question by other people of their community. The results show that in the conformist group (N = 477), more than half of recipients (52.6 %) in some tasks chose their answer on the basis of the responses of other members of the group, which was imaged in a false diagram. 13 % of respondents in this group choose conformist answers to all questions, considering that most of the other respondents in their communities must be right. What is important is that 60% of the answers given in the diagrams (supposedly by the majority of the community) was false and wrong. This study illustrates how to use the Internet even to study phenomena such as group conformity and submission to the dominant opinion of the group (even if it only can be seen in the diagram!). Experiment also showed once again that virtual communities are governed by practically the same rules, which the group operates outside of the Internet.

Another example of the Internet use for experimental studies is to prepare a modified replication of another, earlier experiment. Amy Gonzales and Jeffrey Hancock (2011) in their study decided to carry out an online verification of objective self-awareness theory by Robert Wicklund and Shelley Duval (1972, in: Gonzales, & Hancock, 2011). This theory suggests that "autobiographical stimuli" is a certain stimuli significantly affecting the way that people think about themselves. R. Wicklund and S. Duval (1972) classed as this stimuli for example listening to recordings of your own voice or seeing yourself in the mirror. According to the assumption, the contact with such a stimulus, will lead to a comparison between two constructs: the "real self" and "ideal self", which - in most cases - will lead to a reduction in the self-esteem, due to the adverse outcome of such a comparison. A. Gonzales and J. Hancock (2011) concluded that such a stimulus can also be input to your own profile on the social networking site Facebook, which contains many details about yourself, your photo or status updates of own authorship.

The results were contrary to the underlying theory. Respondents who stepped up their Facebook profile, marked by an increase in self-esteem, not its decline, as in the original studies of the authors of the theory of objective self-awareness. Interestingly, the largest increase in self-esteem was observed in those subjects who visit their personal profile and not only browsed it, but also made some modifications to it (for example, updated their status). The subjects in the control group were placed in situations with the traditional autobiographical impulse according to the theory R. Wicklund and S. Duval (1972) like mirror. Replication by A. Gonzales and J. Hancock (2011) allowed us to capture an additional aspect of the phenomenon of self-awareness and at the same time to extend one of the most important classic and contemporary theories of social psychology.

### SUMMATION

These results of several studies clearly show that the Internet as a research tool provides opportunities that were previously unachievable. It allows us to reach out to many people, which would be impossible or very difficult to achieve in research conducted by traditional methods. In designing the study via the Internet, we are also able to provide audited completely different situation tests – you can take part in it even in your own home. Conducting psychological research on the Internet also allows us to make a modified replication of other experiments in the field of psychology. Often it turns out that some of the mechanisms that govern human behavior operate slightly differently when they are tested in a virtual environment. On the contrary, other psychological theories, confirmed by tests on the Internet, appear to be even more accurate matches and externally verified. Conducting experiments on the Internet is a great opportunity for the development of psychology, which cannot be missed if we want to take care of it and put this science at the highest level.

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