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Psychophysiological methods

Journalistica: The Methods Section

In this section, Journalistica puts a spotlight on research methods used in journalism studies and/or journalism practice.

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1. Description of the method

Psychophysiological measurements trace and record bodily physiological phenomena to draw inferences about psychological processes happening in the mind. In communication research, psychophysiological measures have been used to understand different cognitive and emotional processes during media use (Potter & Bolls, 2012). Psychophysiological measures are especially useful to study causal media effects because they provide an implicit measure of the mental life of media users, are minimally invasive, and can register changes over time.

There exists a range of different psychophysiological approaches. One is to study the body's electrophysical activity in the central and peripheral nervous systems. Central nervous system measures include electroencephalography (EEG), that measures electric activation in the brain. Peripheral nervous system measures include heart rate, facial expressions, and electrodermal activity (EDA) that

measures changes in the skin's electric conductance. Another commonly used psychophysiological approach involves recording people's eye movements to infer cognitive processes such as visual attention, cognitive load, and decision making. In reading research, behavioral eye movement data are often co-registered with more neurological measurements such as EEG or functional magnetic resonance imaging (fMRI) to obtain detailed results about e.g., word processing and memory (Simola, 2011).

2. Example of use

Although psychophysiological measurements are underutilized in journalism research, psychophysiological methods have been used to study aspects of journalism reception (Heiselberg, 2021). EDA has been used to study the effect of tabloid and standard packaging styles on calm and arousing news stories (Grabe, Lang, & Zhao, 2003) and to study gender differences in responses to negative news (Soroka, Gidengil, Fournier, & Nir, 2016). Eye tracking measures have been used to study how news consumption influences learning across different platforms (Kruikemeier, Lecheler & Boyer's, 2018), and to study audience evaluations of news. Some have studied news visualizations (including information graphics), where results showed that news consumers make use of such visualizations, regardless of the platform on which the visual is published (Holsanova, Holmberg & Holmqvist, 2009; de Haan, Kruikemeier, Lecheler, Smit, & van der Nat, 2017). Others have studied how digital news users mostly focus on text rather than multimedia elements (e.g., pictures or videos) (Hassler, Maurer, & Oschatz, 2019). The use of EEG in journalism studies is spare, but Heiselberg (2021) applied EEG measurement, with promising results in a pilot study, to analyze how digital journalism is processed.

3. Main advantages and challenges of using the method

Psychophysiological methods can provide considerable contributions to journalism research. On a basic level, a thorough understanding of how users react to and process multimedia messages across different target audiences can yield vital information about how to design such messages to obtain some desired behavioral effect. The main advantage of psychophysiological measures is that they give insight into the mental processes which are partly involuntary. Therefore, psychophysiological measures as opposed to self-reported measures are less contaminated by social desirability, participants' answering style or interpretation of questionnaire item

wording, limits of participant memory, or, equally important, by observer bias. In addition, psychophysiological measures can be recorded automatically and continuously in real time without disturbing the participant's natural behavior. On a higher level, psychophysiological methods can also enable journalism research to uncover insights into the psychological mechanisms and cognitive states that guide the meaning production of audience members.

The main challenge with psychophysiological measures is to correctly determine the cognitive function of a certain physiological measure. Simply put, if an eye tracking study shows that participants devote a lot of fixations (visual attention) to a text passage, does this indicate reader interest or reader confusion? Another example would be to determine the positive or negative emotional valence of an increased skin response. The response itself signals an increase in arousal level but does not readily differentiate between a negative or positive experience. This challenge could be mitigated using questionnaires and retrospective interviews (Gidlöf, Holmberg & Sandberg, 2012). Furthermore, a lack of adherence to research protocols and guidelines can seriously jeopardize the meaningful use of these methodologies. Reliable results require controlled experiments with close monitoring of variables, large enough sample sizes, and expertise in electrical signal processing. Moreover, the experimental preparations and procedures during testing, such as setting up the equipment, placing electrodes, and testing the signals are time-consuming (Heiselberg, 2021). Lastly, some equipment, such as EEG measurement, is costly. One suggestion for junior researchers would be to collaborate with labs that already use this methodology. In a Nordic setting, such labs are the Humanities Lab at Lunds University, The BASS Lab at Business and Social Science at University of Southern Denmark, Cognition and Behaviour Lab at Business and Social Science, Aarhus University or Experience Lab at Åbo Akademi University.

4. Ethical considerations

Given the psychological effects studied in psychophysiological research, this type of research should operate according to ethical principles laid down by local governing bodies. As in all lab experiments, it is important to obtain informed consent, respect participants' right to withdraw, and consider physical contact between the researcher and participants. According to GDPR, most psychophysiology is considered sensitive personal data, which requires researchers to adequately motivate the collection, processing, and storage of these data.

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