

## Assessing the reporting bias with regard to the laterality of mobile telephone use

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### Background

The so-called laterality problem is decisive for epidemiological research on RF EMF exposure and brain tumours. Findings indicating an increased RR for some types of tumours could be explained by differential reporting biases among cases and controls. The reason is that information about mobile telephone use, including the frequency of use and the duration of calls, are largely assessed through interviews. The completeness and accuracy of the data collected during such interviews is dependent on the correct recollections of those participating in the study. In case-control studies, individuals with brain tumours may recall their mobile telephone use differently than healthy individuals, which can result in a reporting bias.

### Objectives

The proposed experimental study is designed to test the following assumption. Those who have a causal relationship model for pinpointing their brain tumour (I developed a tumour on the left side of my brain because I used the mobile phone on this side) possess a clue, when asked, as to the frequency that they have used their mobile telephone on that side of the brain (as I have a tumour on the left side I must have used the phone more often on this side). Thus, ipsilateral mobile phone use will be overestimated compared to those who do not have such a causal model.

### Methods

Based on a 3x3 factorial design a simulation experiment will be conducted. The first factor refers to the frequency of head-side mobile telephone use (20 % left side, 80 % right side, 80 % left side, 20 % right side, 50 % left side, 50 % right side). The second factor refers to the localization of a tumour in the head (right side, left side, no tumour).

The experiment will be conducted with help of a computer-animated avatar. The procedure is as follows: the study participants will see an avatar with a mobile phone (the Handyman) on a computer screen. They will be informed that they are participating in a “probability learning” experiment and are requested to bet whether the phone line will be occupied or free when the Handyman calls. Immediately after the study participant has made his bet the Handyman will make a call and the participant will see whether he/she has won or lost the bet. This procedure will be repeated twenty-six times. The likelihood of an occupied line is 50%, but randomly assigned over the 26 trials.

According to the first experimental factor (head side of mobile telephone use), the frequency with which the avatar uses the handset will be varied. According to the second factor, study participants will receive different information about the avatar’s brain tumour, but only after the 26<sup>th</sup> trial. One group of the study participants receives the information

that the avatar has a tumour on the right side of the head, the second group receives the information that the tumour is on the left side and the third group receives no information about a tumour.

The estimate of the frequency that the avatar telephones on one side of the head or the other serves as a dependent variable. This estimate will be assessed at the end of the experiment.

The structure of the experiment is depicted in figure 1.

### Hypotheses

H1: Study participants who receive information as to the position of a brain tumour will tend to exaggerate their estimate as to the frequency of the use of the mobile phone on this side.

H2: Study participants with a 50%/50% frequency factor will be more prone to exaggerate when they receive the tumour information because they depend more on a heuristic than those with a 80%/20% and 20%/80% frequency. This is due to the fact that it is more difficult to decide on which side the avatar used the phone more often.

### Expected Results

The study will deliver the first experimental data on the differential reporting bias with respect to laterality and will help to assess the validity of epidemiological data that indicate an elevated risk for brain tumours on the preferred side of the mobile phone use.

Figure 1: Structure of the experiment

