Non-Ionizing Radiation & Children's Health

International Joint Workshop
18 - 20 May 2011, Ljubljana, Slovenia

POSTER ☐

PLATFORM PRESENTATION ☒

Accuracy Of Adolescent SMS-Texting Estimation And A Model To Forecast Actual Use From Self-Reported Data

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Introduction: Due to continued concern that extended cellphone use could be related to increased likelihood of brain tumours, epidemiological studies continue to assess this risk. Such studies may have to rely on participants' recalled levels of cellphone use. Recent studies have noted a pattern of increased scatter with increased use (Vrijheid et al 2009, Inyang et al 2009). Log transformation linearises the data. Psychological research has demonstrated that estimation of observed numerosity appears related to ratios of numbers, rather than absolute values (Dehaene, 2007), suggesting that people think of numbers logarithmically. Our objectives were to assess the accuracy of adolescent recall of SMS (texting); explore the occurrence of logarithmic thinking; and produce a model to forecast 'actual' texting rates, with uncertainties, from recalled data.

Methods: Our study of estimation accuracy was conducted as part of a larger cross-sectional cluster survey exploring wireless phone user-habits among adolescents. At the beginning of the survey, participants who owned a mobile were asked to recall the number of texts they typically sent daily, weekly or monthly. At the end of the survey, they retrieved their use-to-date from their provider, using their phone. The billed rates-of-use in the current month were taken as the gold-standard in the analyses, which were undertaken using SPSS17 and MATLAB. The primary exposure-metrics used in the analyses were log10 actual texts sent (billed) and log10 estimated average texts sent (recalled). The level of agreement between methods, reliability, variabilty and sensitivity were calculated. Normality of distribution of the residuals and homogeneity of the variance were confirmed. A forecast model was developed.

Results: Participation was 85% of those invited (n=373), representative of socio-economic rating and school type. Cellphone ownership was 76%. Texting data were right skewed; this was substantially reduced through log10 transformation. Increasing scatter with increasing numerosity was observed within participants (estimates of use over different periods) and between participants (recalled versus billed use). Both became linear with log transformation. On average, daily-recall overestimated more than weekly-recall. Additionally, mean overestimation of recalled to billed use was not consistent but was highest with lowest use and underestimated by highest users.

Discussion: Similar to visual estimates of numerosity, our study observed a pattern of estimation in ratios, suggesting that this effect also applies to estimating from recollection, and extends to large numbers. We will present a method for predicting actual texting rates, with uncertainties, using recalled data.