

ABSTRACT

School-age children's time-location behavior was characterized for three microenvironments - indoor-home, indoor-school, and outdoors. Subjects (N = 141, 7-11 years old) reported their time-location in structured 24-hour diaries with 30-minute intervals for 6 consecutive days per month for 12 months (June 1995-May 1996). There were 355,320 observations. A multivariate logistic regression model was run for each microenvironment where the binary outcome indicated the subject's presence in a microenvironment during a 30-minute period. The models indicated complex time-location patterns exist at all temporal scales, and that the school schedule dominates these patterns. The models also found that a subject's presence in a particular microenvironment may be significantly positively correlated for as long as two hours prior to the current observation. Subject-specific variables were statistically significant in three instances: having ³⁵ televisions (OR = 1.18 [1.03:1.34]) for the indoor-home model; and being male (1.13 [1.05:1.22]) and having respiratory disorder (0.92 [0.85:0.98]) for outdoor.

For this analysis, the data were modeled with logistic regression, and to account for the longitudinal nature of the observations, the standard errors of the odds ratios (ORs) were empirically adjusted with the method of generalized estimating equations (GEEs) (Liang and Zeger 1986) implemented with alternating logistic regressions (ALR; ALR log odds ratio exchangeable among all subjects)(Carey, Zeger et al. 1993). This is the only application of longitudinal modeling to time-location diary data the authors are aware of.

INDEX TERMS

alternating logistic regression, generalized estimating equations, Southern California, time-location.