Research Article

SOCIABILITY AND SUSCEPTIBILITY TO THE COMMON COLD

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worker) and the number of people talked to (in person or on the phone) within these roles in a 2-week period. Marital status was also recorded. The 12-item version of the Interpersonal Support Evaluation List (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) assessed participants' perception that others would provide them with support in the face of stressful events. Internal reliability for the ISEL was .87.

Data on emotional style were collected during the six interviews described earlier, as well as on the evening of the Day 0 (before virus exposure) of quarantine. Each evening, participants were asked how accurately (from 0, , to 4,) each of nine positive and nine negative mood adjectives described how they felt during the last day (Cohen, Doyle, Turner, Alper, & Skoner, in press). The positive adjectives included

Table 2.

	Illness criterion	
Control measure	Objective	Subjective
Preexisting antibody	= −0.65 ± 0.28, < .02	= −0.80 ± 0.26, < .002
Virus type (RV23 or 39)	= −0.82 ± 0.30, < .006	= −0.74 ± 0.28, < .007
Age	n.s.	= −0.66 ± 0.29, < .05

Volunteers were considered to have a clinical cold if they both were infected and met illness criteria. They were classified as infected if the challenge virus was isolated on any of the 5 postchallenge study days or there was at least a 4-fold rise in virus-specific serum antibody titer from before exposure to 28 days after exposure. We used two alternative illness criteria. The objective criterion required a total adjusted mucus weight of at least 10 g or total adjusted mucociliary nasal clearance time of at least 35 min (Cohen et al., 1997). The subjective criterion (modified Jackson criterion) required a total adjusted symptom score of 6 or higher, in addition to either reporting having a cold or reporting runny nose on 3 or more days (e.g., Cohen et al., 1997).

Statistical Analyses

Body mass index, total symptom scores, mucus weight, mucociliary clearance scores, cortisol level, epinephrine and norepinephrine levels, number of cigarettes per day, number of alcoholic drinks per day, and zinc and vitamin C intake were all log-transformed (base 10) to better approximate a normal distribution. We used stepwise logistic regression to predict the binary outcome presence/absence of a cold. Sociability measures were treated as continuous variables, and we report the regression coefficients, with standard errors and probability levels. In several cases, we also provide an estimate of relative risk—the ratio of risk (odds ratio and 95% confidence interval, CI) of participants with lower levels of sociability (each of the bottom 4 quintiles) relative to participants with the highest sociability (top quintile). We sequentially added variables to the first step of regression analyses in order to determine whether the association between sociability (entered alone in the second step) and susceptibility to colds is substantially reduced after controlling for the contribution of other variables. All analyses we report included the eight control variables. Interaction terms were entered together in a third step of the equation.

RESULTS

Table 2 presents the significant associations between control variables and frequency of colds. Having previous antibody and being exposed to RV23 rather than RV39 were both associated with fewer colds by both the objective and the subjective illness criteria. For the subjective criterion only, being 18 to 21 years old was associated with fewer colds than being older. None of these variables, however, were associated with sociability.

We examined the association of each of the components of sociability with frequency of colds. As is apparent from Table 3, higher scores for extraversion, agreeableness, and positive relationships were all associated with decreased risk for colds, irrespective of the illness criterion. To simplify presentation, for the remaining analyses we use the sociability index. This index provides a broader conceptual scope and better reliability than the three individual measures.

As is apparent from Figure 1, increases in sociability were associated in an approximately linear manner with decreases in the rate of illness defined by both criteria (statistics for sociability treated as a continuous variable are in Table 3). The adjusted odds ratios were 2.9 (CI = 1.12, 7.37), 3.0 (CI = 1.22, 7.47), 2.2 (CI = 0.89, 5.34), 1.4 (CI = 0.52, 3.66), and 1 (reference group) for objectively defined colds and 4.4 (CI = 1.76, 11.16), 4.8 (CI = 2.00, 11.74), 2.3 (CI = 0.96, 5.58),

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