Supporting Online Material

Cyberball methodology. Thirteen undergraduate students (9 female) were paid $25 for participation. As the cover story, participants were told that the experimenters were interested in synchronous neural activity and that they would be playing a virtual ball-tossing game with two other participants, each in fMRI scanners. Prior to scanning, participants were shown a news article about a previous study that investigated neural activity between two individuals interacting in fMRI scanners [S.Nadis, *Nature*, 416, 364 (2002)] to bolster the credibility of the experimental design.

Each scan began with a still picture of the two virtual players in the upper corners of the screen and an arm, representing the participant, in the lower-center portion of the screen. The participant's name was displayed below the arm while two other names were displayed below each of the two virtual players' animated cartoon representations. After 9s, the cartoon player in the upper left-hand corner started the game by throwing the ball to one of the players. The participant could return the ball to one of the players by pressing one of two keys on a button box. The CyberBall program was set for 60 throws per scan, with the computer players waiting 0.5-3.0 seconds before making a throw to heighten the sense that the participant was actually playing with other individuals. Immediately following the scanning session, participants completed a brief questionnaire which contained a manipulation check to make sure that participants noticed the exclusion and felt excluded and a measure of self-reported social distress (18,19) which assessed

participants' feelings of self-esteem ("I felt liked."), belongingness ("I felt rejected."), meaningfulness ("I felt invisible."), and control ("I felt powerful.").

fMRI methdology. Data were acquired on a G.E. 3T full-body scanner with an upgrade for echo-planar imaging. Head movements were restrained with foam padding and surgical tape placed across participants' foreheads. High-resolution structural T2-weighted echo-planar images (spin-echo; TR = 4000ms; TE = 54ms; matrix size 128x128; 26 axial slices; 3.125-mm in-plane resolution; 4-mm thick, skip 1-mm) were acquired coplanar with the functional scans. Three functional scans, each lasting 2 minutes and 30 seconds, were acquired (echo planar $T2^*$-weighted gradient-echo, TR = 3000 ms, TE = 25ms, flip angle = 90°, matrix size 64x64, 19 axial slices, 3.125-mm in-plane resolution; 4-mm thick, skip 1-mm) spanning the dorsal-ventral extent of the ACC. Participants viewed stimuli through goggles connected to a computer that presented the CyberBall program (http://www.psy.mq.edu.au/staff/kip/cyberball.htm). The imaging data were analyzed using SPM'99 [Wellcome Department of Cognitive Neurology, Institute of Neurology, London, UK]. Images for each subject were realigned to correct for head motion, normalized into a standard stereotactic space, and smoothed with an 8mm Gaussian kernel, full width at half maximum, to increase signal-to-noise ratio. The design was modeled using a boxcar function convolved with a canonical hemodynamic response function. Linear contrasts were employed to assess comparisons of interest within individual participants. Random effects

analyses of the group were computed using the contrast images generated for each participant.