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Figures and figure supplements

A social chemosignaling function for human handshaking

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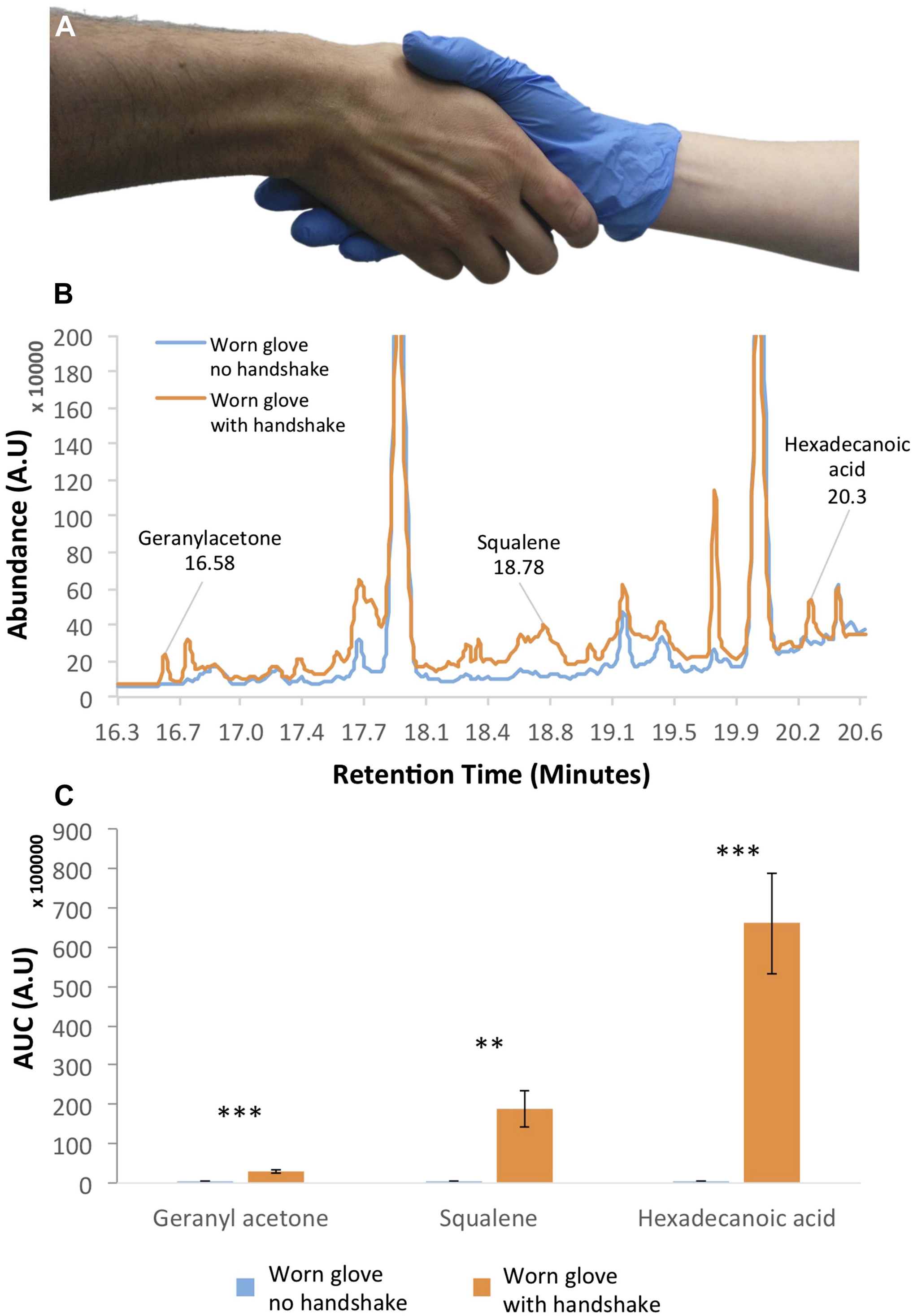

Figure 1. Handshakes can transfer chemosignaling components. (**A**) A representative image of our sampling method using a nitirle glove during handshake. (**B**) An example chromatogram from one experiment. Note that the 'clean' condition is a glove worn by the same hand, but not shaken. This controls for potential contamination from the glove-wearing hand. Most unmarked peaks in the chromatogram that are present in both the clean and the shaken are PDMS artifacts—various siloxane compounds that come from either the twister used to sample the gloves or the GC column. Moreover, some peaks that are present in this example were not present across subjects. The only three peaks that were present following all shakes but never once in control are those we describe in the

Figure 1. continued on next page

Figure 1. Continued

following panel. (**C**) Summated data from 10 individuals (each an average of three shakes) demonstrating three compounds of interest in chemosignaling (***Gallagher et al., 2008***) that were effectively transferred by handshaking in all instances and never once in control. Error bars are standard error, $^{**}p < 0.01$, $^{***}p < 0.001$.

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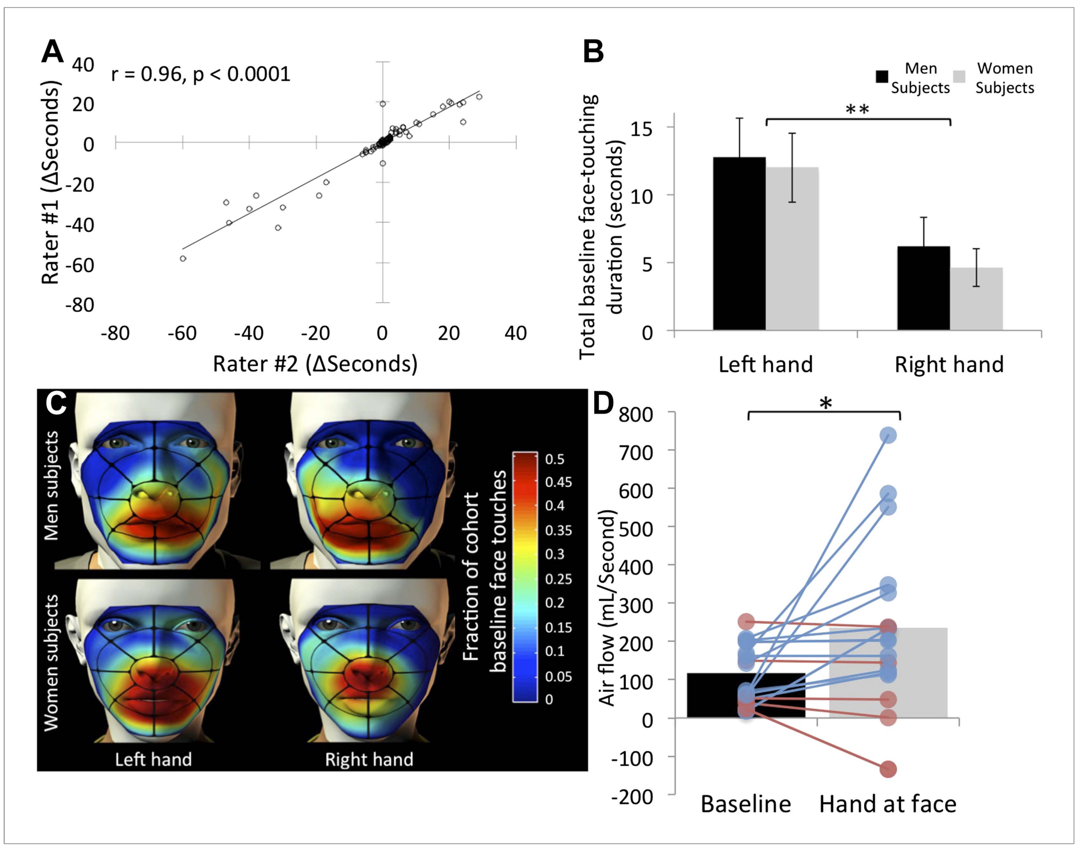

Figure 2. Humans often touch their own face and concurrently sniff. (**A**) Agreement in scoring of 153 subjects across two independent raters. (**B**) Total face touching duration during the 1-min baseline. (**C**) Spatial distribution of face touching during the 1-min baseline. Grid reflects 17 facial regions. (**D**) Measure of nasal airflow during baseline vs the time when a hand was at the face. Subjects that increased flow in blue and subjects that decreased flow in red. Solid bars reflect the mean. Error bars in **B** are standard error. $^{**}p < 0.01$. $^{*}p < 0.05$.

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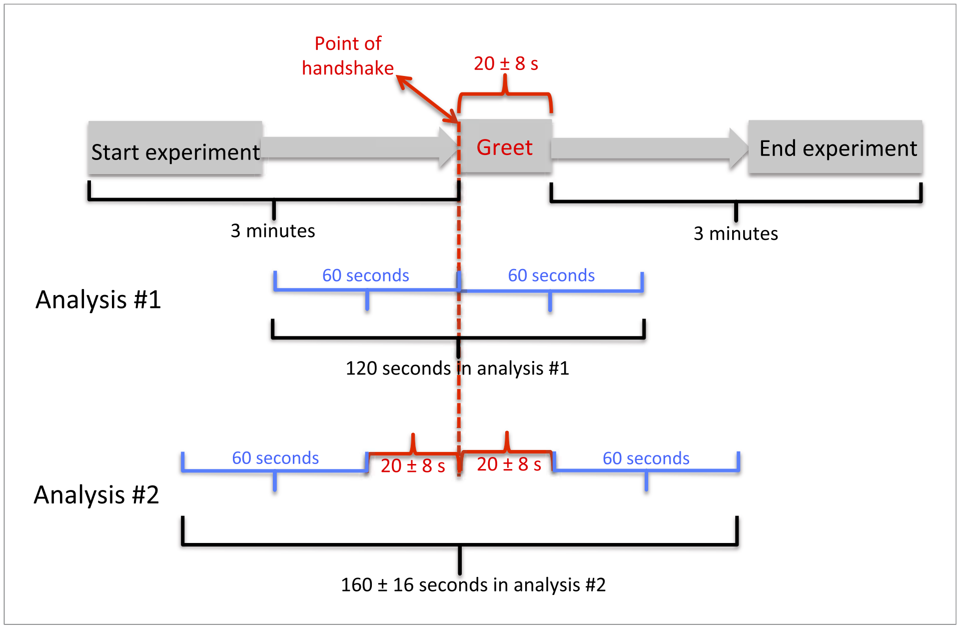

Figure 2—figure supplement 1. Experimental time-course. We initially decided to analyze 1 min before and 1 min after handshake (analysis #1). We then noted, however, that this analysis may be inappropriate, because in the 60 s post handshake, an experimenter was still in the room for about 20 s with variance across subjects. This variance introduced potential imbalance across subjects. For example, a subject with a 14 s greet was then alone for an added 46 s of observation, yet a subject with a 29 s greet was then alone for an added 31 s of observation. To account for this potential imbalance, we added for each subject his/her individual greet time (20 ± 8 s) to each end (pre and post) of the observation. Thus, we end with ~80 s before and after the handshake event. The results of these two analyses (120 and ~160 s) were nearly identical (no effects lost or gained), with slightly stronger effects in analysis #1. We present analysis #2 in the manuscript.

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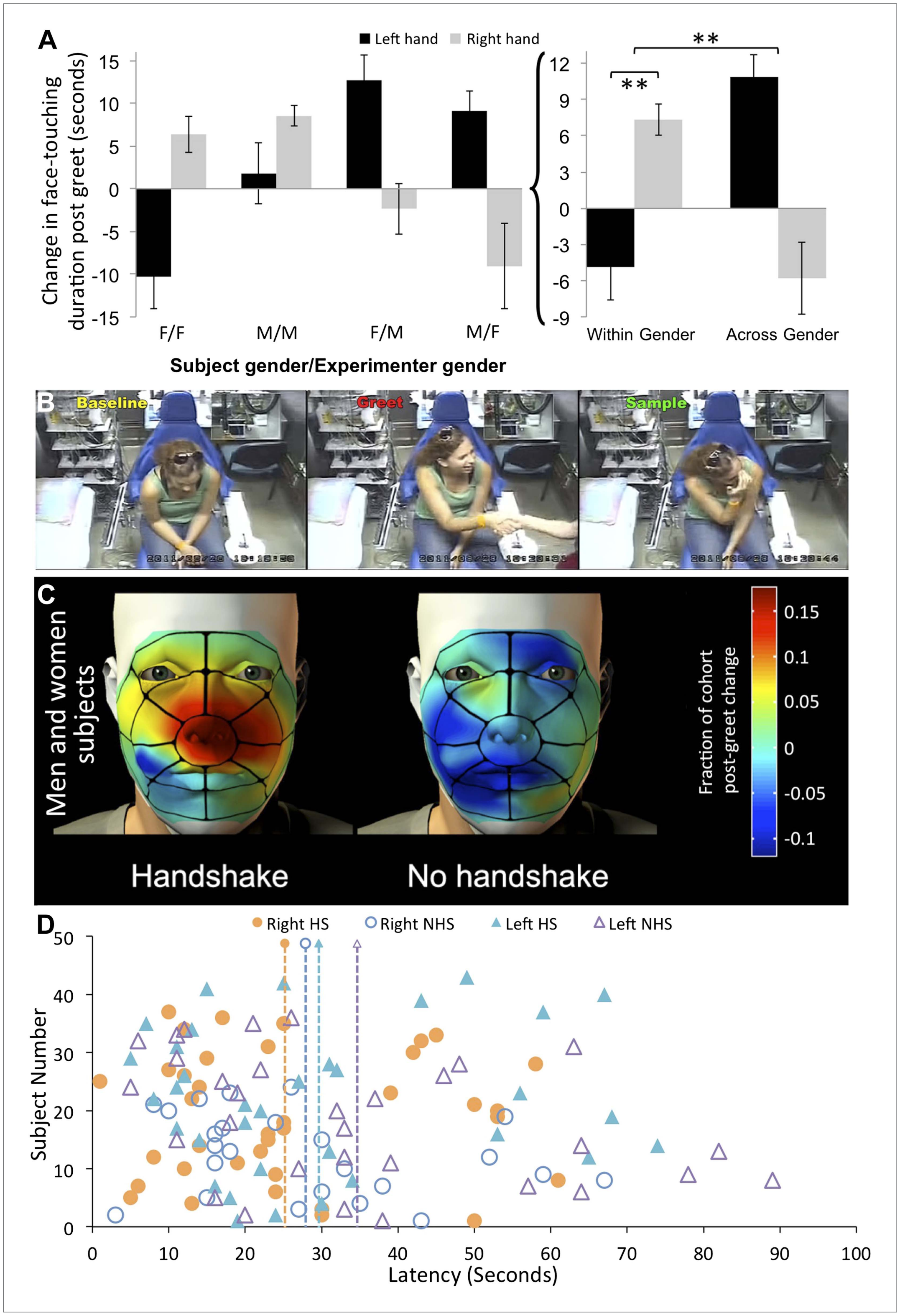

Figure 3. Humans sniff their own hands after handshake. (**A**) Right and left hand changes in duration of face-touching following a greet. Duration change scores are after individual-baseline and condition-baseline normalization. The lettering under each pair of columns (e.g., F/F) reflects the 'Subject gender/Experimenter gender' interaction, respectively. The summation on the right is the interaction reflecting increased sampling of the right hand following within gender greets with handshakes, and increased sampling of the left hand following cross-

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Figure 3. Continued

gender greets without a handshake. (**B**) Three screen-shots depicting from left to right: a subject during baseline before the greet, then during handshake greet, and finally self-sampling after the experimenter leaves the room (see ***Video 3***). (**C**) The spatial distribution of change in right-handed face-touching following the greet. (**D**) Latency to face-touch in the handshake (HS) and no-handshake (NHS) conditions. The figure contains only subjects who touched their face within the analysis time window. The 14 subjects with left hand continuously at face before during and after the greet were omitted from the figure. The dotted lines reflect the mean for each condition. Error bars are standard error. $^{**}p < 0.01$.

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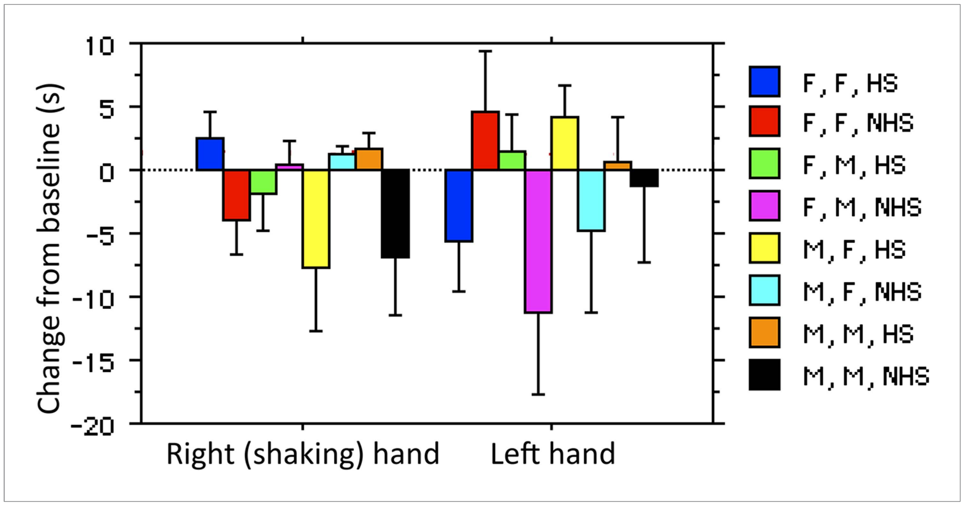

Figure 3—figure supplement 1. Reanalysis without correcting for condition-specific baseline. The color legend reflects the type of interaction: subject gender (F/M), experimenter gender (F/M), and nature of greet with or without handshake (HS/NHS). The raw data for this analysis are in Supplementary file 1, and the ANOVA table is in Supplementary file 2. We conducted a repeated measures omnibus analysis of variance (ANOVA) with factors of subject gender (M/F), experimenter gender (M/F), and nature of greet (handshake/no-handshake), and a dependant repeated compact variable of exploration change time for right (shaking) and left (non-shaking) hands (hand). The ANOVA revealed no main effects or secondary interactions other than one highly significant interaction of subject gender × experimenter gender × greet × hand ($F[1,145] = 12.75$, $p = 0.0005$). This reflected a gender × experimenter gender × greet interaction for the right shaking hand ($F[1,145] = 9.46$, $p = 0.0025$), whereby both men and women equally ($F[1,152] = 1.06$, $p = 0.3$) increased apparent olfactory right hand exploration after shaking the hand of a same gender individual (change after handshake greet = 2.14 ± 8.1 s, change after no-handshake greet = −5.39 ± 15.3 s, $t[71] = 2.69$, $p = 0.009$), but not the hand of an opposite gender individual (a trend in the opposite direction, towards decreasing hand exploration: change after handshake greet = −4.85 ± 18.92 s, change after no-handshake greet = 0.94 ± 5.58 s, $t[78] = 1.84$, $p = 0.07$). In other words, individuals significantly increased right hand exploration only following the same gender greets that contained a handshake. In contrast, for the left non-shaking hand, a gender × experimenter gender × greet interaction ($F[1,145] = 5.14$, $p = 0.02$) reflected mostly trends, which moreover were in the opposite direction from the right hand. Specifically, both men and women equally ($F[1,145] = 0.53$, $p = 0.47$) did not change left non-shaking hand exploration after shaking the hand of a same gender individual (change after handshake greet = −2.85 ± 16.72 s, change after no-handshake greet = 1.64 ± 22.08 s, $t[71] = 0.99$, $p = 0.33$), yet had higher left non-shaking hand exploration after shaking the hand of an opposite-gender individual (change after handshake greet = 2.91 ± 11.84 s, change after no-handshake greet = −7.95 ± 28.33 s, $t[78] = 2.26$, $p = 0.03$). Note that this latter effect was not driven by increases in sampling after the handshake greet (+2.9 s), but rather by avoiding self-sampling after no-handshake greet (−7.95 s). Taken together, these data imply that after greeting individuals across gender without a handshake, humans may increase left non-shaking hand exploration, yet after shaking hands with individuals of the same gender humans robustly selectively increase investigation of only the hand that shook.

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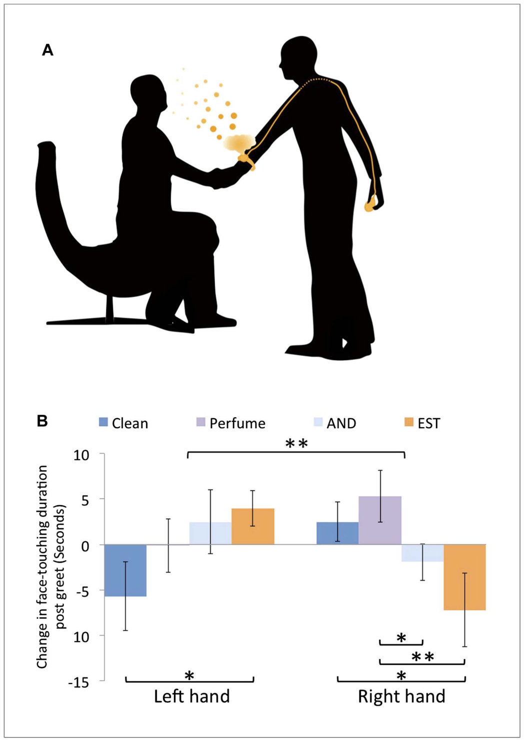

Figure 4. Tainting with odors alters post-handshake hand sniffing. (**A**) A schematic of the covert tainting device used for AND and EST. The non-shaking hand covertly activated a modified watch on the shaking hand that then emitted a plume of odor during handshake. (**B**) Face-touching behavior following tainting. Duration change scores are after individual-baseline normalization only. Error bars are standard error. **$p < 0.01$. *$p < 0.05$.

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