Reliability of smile judgments

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Magnitude estimates of smiles on tachistoscopically presented photographs of faces were demonstrated to be reliable. While estimates were altered by varying exposure duration, judgments were not influenced by observer-observed face orientation.

Perception of facial expressions involves judgment by an observer (O) maintaining some given orientation to the face of the person perceived. This judgment situation has found considerable use in studies of the development of the smiling response in infancy. A particularly good case is a study by Watson (1966) in which infants' smiling responses were judged as a function of the orientation of the face stimulus eliciting the response. In Watson's study, the infant was responding to the experimenter's face, presented at varying orientations in the infant's line of sight. Since the experimenter (the O, from our standpoint) was at the same time judging the infant's smiling response, stimulus orientation varied in a manner confounded with the perspective of O. As Watson pointed out, one problem with such a procedure is that O's judgments may not be equally sensitive when veiwing the infant's smiling response from different perspectives. For example, O may be less sensitive to changes in magnitude of smiles in an "upside-down" orientation than in an "upright" orientation. The present experiment attempted to assess potential orientation differences in the judgment of smiles and to estimate the reliability of such judgment.

Method

Stimuli to be judged were 20 black-and-white, 8 in. square enlargements of closed-mouth smiling faces, 5 of each of 4 college undergraduates (2 men, 2 women). The stimuli were chosen to range from "no smile" to a relatively full smile. Stimuli were exposed individually for .2 sec using a Gerbrands T-1C tachistoscope, modified to allow O to precipitate the exposure. Each stimulus was presented once from each of three orientations, 0 deg, 90 deg, and 180 deg, relative to O's perspective. A different random order of stimuli was used for each O. There was thus a total of 60 judgments made by each O, with rest intervals given when requested.

Instructions were to make magnitude estimates of the intensity of the smile. The nature of such ratio-scale judgments was outlined and two sample stimuli from the extremes were presented as range anchors. No numerical standard was specified.

The Os were 5 men and 5 women undergraduates at Albion College who received introductory psychology course credit for participating. One month after the first session, Os returned for a retest. Procedure and instructions were the same as originally, with the addition that Os were asked not to try to remember their earlier responses but to judge the stimuli as they currently perceived them.

Results and Discussion

Reliability. Reliability of judgment was assessed for the 60 stimuli irrespective of O and for the judgments of the 10 Os, individually. The product-moment r for the mean test-retest judgments of the 60 stimuli (over all Os) was .96. The correlations for individual Os ranged from .64 to .86 with a mean of .77, all significantly greater than zero (p < .05). There was no evidence of differential reliability as a function of orientation, sex of stimulus, or sex of O. Judgment of smile magnitude therefore appears to be a task that can be performed with high reliability. A given smile is perceived to be of the same *relative* magnitude from one occasion to another.

Magnitude Estimates. The *absolute* judgment of the stimuli decreased from test to retest (t = 8.05, df = 59). The mean judgment was 2.8 in the first session and 2.5 during the second. The standard deviation of judgments was also smaller on the second session (1.27 vs 1.16). Judgments ranged from 0 to 10.

Table 1
Mean Magnitude Estimates over 40 Judgments

Orientation	Rank Smile Magnitude				
	1	2	3	4	5
Session 1					
Upright	1.17	2.12	2.60	4.05	4.45
Side	1.10	2.35	2.80	4.18	4.25
Upside-down	1.32	2.30	2.65	3.48	3.58
Session 2					
Upright	.90	1.83	2.80	3.38	4.10
Side	.90	1.85	2.42	3.50	3.80
Upside-down	1.00	1.77	2.48	3.03	3.25

To assess the effect of orientation, judgments were combined across Os and stimuli of given rank magnitude for the four faces. Table 1 presents these mean magnitude estimates. Each entry represents the mean of four judgments by each of 10 Os. The only apparent trend suggesting an orientation effect is with relatively full smiles (Rank 5), where magnitude estimates appear to decrease as a stimulus is rotated from upright to upside-down. The reliability of these differences was estimated with Duncan's Range Test. In both Session 1 and Session 2 data, the judgments of upside-down stimuli were significantly smaller than those of upright stimuli. Rank 4 (and presumably lower) stimuli did not yield reliable differences.

It therefore appears that judgment of smile magnitude was affected little by orientation of face-to-face contact. The one situation where differential judgment was shown was in viewing relatively full, closed-mouth smiles in an upside-down orientation. In order to look more closely at this difference, a second experiment similar to the first was conducted. An open-mouth full smile was added to two of the previous stimulus sets (1 man, 1 woman), giving a total of 12 faces. Each face was presented in each of the three orientations. Two groups of 10 new Os viewed under exposure durations of either .2 or .8 sec. The instructions were changed to require judgments relative to a Rank 3 standard stimulus which was assigned the number "10." This change was introduced to encourage Os to use a greater range of responses.

The results of the second experiment corroborated those of the first. Under the .2 sec exposure, the Rank 5 stimuli again elicited smaller magnitude estimates when in an upside-down orientation. But Rank 6 (open-mouth) stimuli produced no difference in judgment as a function of orientation. Under .8 sec exposure, orientation did not affect judgment. Magnitude estimates at .8 sec tended to be greater than those at .2 sec.

In conclusion, then, as long as face-to-face contact is maintained between an O and a perceived face, orientation appears to have no appreciable effect upon the magnitude of smile perceived on the face. The orientation variable is therefore probably not important in contemporary studies (e.g., Watson, 1966) requiring judgments of smiles in varying orientations. In addition, such judgments are shown to be highly consistent, particularly in light of the artificiality imposed by tachistoscopic viewing and the brief exposure used here. This suggests considerable reliability on the part of Os in making judgments of such complex stimuli.

REFERENCE

WATSON, J. S. Perception of object orientation in infants. *Merrill-Palmer Quart. Behav. Develpm.*, 1966, 12, 73-94.