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Looking beyond the face: A training to improve perceivers' impressions of people with facial paralysis

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Abstract

Objective—Healthcare providers and lay people alike tend to form inaccurate first impressions of people with facial movement disorders such as facial paralysis (FP) because of the natural tendency to base impressions on the face. This study tested the effectiveness of the first interpersonal sensitivity training for FP.

Methods—Undergraduate participants were randomly assigned to one of two training conditions or an untrained control. *Education* raised awareness about FP symptoms and experiences and instructed participants to form their impressions based on cues from the body and voice rather than the face. *Education+feedback* added feedback about the correctness of participants' judgments. Subsequently, participants watched 30 s video clips of people with FP and rated their extraversion.

Results—Participants' bias and accuracy in the two training conditions did not significantly differ, but they were significantly less biased than controls. Training did not improve the more challenging task of accurately detecting individual differences in extraversion.

Conclusion—Educating people improves bias, but not accuracy, of impressions of people with FP.

Practice Implications—Information from the education condition could be delivered in a pamphlet to those likely to interact with this population such as healthcare providers and educators.

Keywords

interpersonal sensitivity training; facial paralysis; facial movement disorders; interpersonal perception; accuracy

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1. Introduction

Upon first acquaintance, lay people and healthcare providers alike frequently misinterpret facial movement disorders such as facial paralysis or palsy (FP) as unfriendliness or unhappiness [1–3]. More than 130,000 Americans develop FP each year from a variety of conditions, including Bell's Palsy, Moebius syndrome, damage to the facial nerve from neoplasms, and trauma [4]. Often, once the underlying condition has been resolved, chronic FP remains [4]. Due to the low muscle tone caused by FP, facial sagging may be misinterpreted as a frown. Even unilateral FP, in which facial expression is preserved on one side, disrupts communication of facial expression [5]. For example, a unilateral smile might be interpreted as a contempt expression.

Most discussions of how to improve social functioning for people with FP and other facial differences have taken a medical model perspective, focusing on changing the individual through surgery [6], cognitive behavioral therapy [7], or social skills training [8]. However, social psychological and disability studies perspectives, which promote a social construction model of disability [9], would suggest that a more appropriate and powerful way to improve communication for people with FP would be to attempt to change the way others perceive them. An intervention of this nature could be administered to people who are likely to interact with people with FP, such as healthcare providers and educators. The present study represents an initial attempt to train perceivers to form more positive and accurate impressions of people with FP.

To compensate for their lack of facial expression, some people with FP report increasing expressivity in their bodies and voices [10,11]. Indeed, people with congenital FP are more likely to use this compensatory expression than those with acquired FP [12], in line with the general finding that people with congenital disabilities are better adapted than those with acquired conditions [13]. One of the few studies of impressions of people with FP used a thin slice design common to first impression research, meaning participants viewed short (20 s) clips of people with severe and mild unilateral and bilateral FP and rated their impressions of them [1]. Participants were randomly assigned to view combinations of channels (e.g. voice+speech+body or all channels). Participants were particularly poor at recognizing happiness in people with severe, compared to mild, FP, but were less impaired in recognizing sadness. Results showed that perceivers rated the happiness of severe and mild targets most similarly and most positively when they could observe all channels except the face. Importantly, perceivers were better able to recognize happiness in people with FP who used compensatory expression. Thus, focusing on channels other than the face results in better impressions of FP targets.

Recognizing extraversion, or friendliness and interest in socializing, at first acquaintance is perhaps even more crucial to social functioning than recognizing emotion. Because smiling signals extraversion and a willingness to socialize [14–16], people with FP are likely to be perceived as introverted. Although perceivers are usually quite accurate in judging extraversion of people without facial movement disorders based on photos or very short video clips [17,18], extensive research on people with Parkinson's disease (PD), a condition that often results in impaired nonverbal expression, has found that perceivers have difficulty

recognizing extraversion in these individuals [2,3]. A notable finding is that healthcare practitioners experienced with PD had similar levels of difficulty as university students or older adults [3]. The tendency to assume that people with inexpressive faces are less sociable seems to be based on a largely automatic and unconscious heuristic strategy [19]. Even the most well-intentioned healthcare practitioners may have difficulty overriding this natural tendency to form social judgments based on facial expression [3]. These judgment errors may have important ramifications for healthcare practitioners' abilities to assess patients' pain, make diagnoses, and formulate individualized treatment plans appropriate to the patients' personality [20].

Starting in infancy, people automatically attend to the face [21]. However, the best strategy for forming accurate impressions of people with FP is to override this tendency and attend to the body and voice [1]. Additionally, people stare at novel stimuli, such as people with disabilities, in an attempt to understand them [22,23]. Indeed, being stared at in public is a common concern for people with FP [10]. Madera and Hebl [23] recently demonstrated the detrimental effects of focusing too much on a facial difference when forming impressions. In this study, participants viewed a photo of a job candidate, listened to an audio recording of a purported job interview, and rated the candidate on his or her qualifications. Some of the photos were digitally altered to include a facial disfigurement on one cheek. Using eyetracking methodology, the researchers found that participants looked more frequently at the job applicant's cheek when there was a scar present. Crucially, visual fixations on the scar were associated with lower ratings of the applicant's qualifications, and this was mediated by poorer memory of facts about the applicant. Thus, staring at a facial difference results in divided attention, reducing perceivers' ability to focus on information important to accurate impressions.

We drew our training intervention from the interpersonal sensitivity training literature, which attempts to improve people's ability to recognize traits or emotions in others. To our knowledge, this research has not yet been extended to people with expressive disorders, one of the populations that would benefit most. Interpersonal sensitivity trainings can be categorized into four approaches: practice, awareness raising (about the importance of interpersonal sensitivity), education (about what diagnostic cues to look for), and performance feedback [24]. Blanch-Hartigan [25] tested a program to improve interpersonal sensitivity toward patients in a sample of undergraduate students and found that a combination of all four approaches was the most effective, with the single most effective method being performance feedback.

Education about how to interpret behavior has only shown modest success in improving interpersonal sensitivity towards typical and stigmatized groups [25–28]. However, we suspected this approach might be more useful for FP. Most people have not heard of FP and are not aware of the communication challenges faced by individuals with it. FP is a highly visible, but *unrecognizable* condition. That is, people will notice that the face looks unusual but will not understand the cause or nature of the difference, or the accommodations that might be needed. People may become preoccupied by trying to figure out the cause (did the person get a Novocain shot at the dentist?). They may not even be able to pinpoint that the nature of difference is due to paralysis, and they may attribute it to the person's character,

assuming they are unfriendly or even intellectually disabled [10,11]. People are unfamiliar with the appropriate accommodations for a person with FP (focus on the body and voice). Indeed, people with FP observe confusion among strangers meeting them for the first time. “I always think that there is a moment of hesitation when I start talking to people. They are listening, but they are thinking, ‘why is she talking like that?’” [10]. Educating about FP causes, nature, and accommodations could improve interpersonal sensitivity.

Providing feedback about whether a perceiver's judgment is correct is the single most effective approach to improving interpersonal sensitivity [29]. Feedback resembles the natural process through which people's perceptions are shaped by their social environment; people learn whether their social judgments about a person are right or wrong based on the person's subsequent behavior. Thus, feedback is expected to help people hone their diagnostic skills. Explicitly attending to the body and voice may become implicit as people learn which expressive cues predict extraversion from trial and error.

Accuracy and *bias* are distinct concepts in personality impression formation research [30]. Trainings typically define interpersonal sensitivity in terms of accuracy, or the ability to detect individual differences among targets. In other words, it is the ability to identify that one person is extraverted, while another one is introverted. Fewer studies have examined bias, or the tendency to rate a group of people negatively overall. A bias analysis would detect whether perceivers rated people with FP as low on extraversion on average, an indication of perceivers’ amount of stigmatization of the group. It is possible to have both inaccurate and biased judgments or one or the other. Thus, both accuracy and bias analyses are needed to get a complete understanding of the way people with FP are perceived.

This study fills an important gap in the literature, testing a social model approach to improve interpersonal sensitivity towards people with FP. Further, we tested the boundary conditions of interpersonal sensitivity trainings, examining a specific condition which may benefit from training approaches that have been found to be ineffective among a general patient population, and examining how both bias and accuracy are affected. Our first hypothesis was that perceivers would be better at recognizing extraversion in people with mild FP compared to those with severe FP. Second, we hypothesized that the training conditions would result in better recognition of extraversion than the control group, with the best recognition occurring in the education+feedback condition. Third, we hypothesized that this effect would be strongest among those with severe FP.

2. Methods

2.1 Stimuli

The stimuli were drawn from an existing stimuli set of videos of people with FP (targets). The process for obtaining and coding the stimuli is described in the original paper [12] and summarized here. Targets were twenty-seven people with FP (M_{age} = 44.59, SD_{age} = 12.60, 66.7% female) with the following FP etiologies: Moebius syndrome (n=13), benign facial tumors (n=6), unremitted Bell's palsy (n=4), infection (n = 2), facial nerve trauma (n=1), and brainstem tumor (n=1). Sixteen targets had unilateral FP and 11 had bilateral FP. Targets had completed the following item from the Ten-Item Personality Inventory (TIPI) [31]: “I

am...extraverted, enthusiastic" for use as a criterion of personality, which had a 7-point response scale ranging from strongly disagree to strongly agree. One 30 s thin slice clip was extracted from video of each target describing a happy event in his or her life, beginning at a standardized time point, yielding 27 clips in total. Showing targets recalling a happy event was intended to simulate a first impressions situation in which the person with FP is putting his or her best foot forward and showing as much positive expressivity as possible.

2.1.1 FP severity—Control targets without FP were undesirable because they would differ from people with FP in appearance, life experience, and stigma. Thus, people with mild FP served as a comparison group for people with severe FP. In order to determine the FP severity of targets, five research assistants were instructed to consider the frequency, duration, and intensity of the target's facial movement when rating the following single item: "overall expressivity" on a scale from 1 to 5 [12]. Ratings were done separately for each side of participants' faces. For each target, ratings were averaged across raters (effective reliability $r = .87$), and then across face side. Finally, ratings were dichotomized by median split into high and low FP severity. This rating method was preferred over commonly used clinical measures of FP severity because of its ecological validity. The present method was sensitive to spontaneous expressions that are observable during social interaction, rather than commonly used clinical measures like the House-Brackmann Grading System [32] or Sunnybrook Facial Grading Scale [33] that assess the ability to voluntarily form certain expressions on command. Further, most existing clinical measures were not designed for use with bilateral FP [32,33]. Sunnybrook Facial Grading Scale ratings of the targets provided evidence for good convergent validity, $r = .79$ [12].

2.2 Perceivers

Participant perceivers were 110 Tufts university undergraduate students (67% female) who completed the study for partial course credit. They identified as 59% Caucasian, 30% Asian, 8% African descent, 11% Hispanic, 2% Native American, 5% Middle Eastern, and 5% other. (16% reported multiple ethnic identities, thus the percentage breakdown of ethnic identities adds up to more than 100.)

2.3 Procedure

This study was approved by the Institutional Review Board and informed consent was obtained for all participants. At the beginning of the study, perceivers were randomly assigned to an education, education+feedback, or control condition, described below. Then, perceivers viewed 27 30 s clips of targets with FP in one of two randomized orders. After viewing each clip, perceivers rated their impressions of each target's extraversion with the same TIPI item that targets had answered about themselves, modified to collect other, rather than self, ratings.

In the education condition, prior to beginning the study, perceivers read a short statement describing common causes, symptoms, and experiences associated with unilateral and bilateral FP, and instructing them to focus on the body and voice when rating their impressions (see Appendix). In the education+feedback condition, perceivers were given the education text and feedback after each rating about the target's actual response to the TIPI

extraversion item. (E.g. “in a self-report questionnaire, the person in the video gave the following answer to this question: I am extraverted and enthusiastic: ‘[disagree strongly/ agree strongly, etc.].’”). Targets’ self-reports ranged from “strongly disagree” to “strongly agree,” so perceivers received a range of feedback reflecting targets’ individual differences. After receiving feedback on the first 13 targets, perceivers were notified that they would no longer receive feedback. The control condition did not include any of the training components. After finishing the rating task, perceivers provided demographic information.

2.4 Data Analysis

In order to determine whether severe and mild targets were equivalent in self-reported extraversion, we conducted a one-way ANOVA of FP severity on self-reported ratings on the TIPI extraversion item. Severe targets (M = 4.29, SE = 0.51) did not significantly differ from mild targets (M = 4.70, SE = 0.54) in self-reported extraversion, $F(1,26) = 0.36$, $p = .55$, $\eta_p^2 = .01$.[1]

Next, we conducted a 3 (training condition: education, education+feedback, control) × 2 (severity: severe or mild) ANOVA with repeated measures on the last factor, separately on perceivers’ bias and accuracy in rating targets’ extraversion.[2] Bias is the extent to which perceivers tend to rate a group of targets negatively overall, and it was calculated as perceivers’ mean extraversion ratings separate for severe and mild targets. Accuracy is the degree of correlation between targets’ self-reported extraversion and perceivers’ impressions of targets’ extraversion. Accuracy coefficients were computed for each personality trait by correlating, for each perceiver, their ratings of targets’ extraversion with the targets’ self-reported extraversion. The coefficients for each perceiver's judgments were transformed to Fisher's Zr to normally distribute scores, and then averaged for each perceiver. If the 95% CI of the average accuracy score does not include zero, a perceivers’ accuracy is significantly greater than chance.

3. Results

3.1 Bias

Supporting our first hypothesis, there was a main effect of severity, indicating that severe targets (M = 4.23, SE = .09) were rated as less extraverted than mild targets (M = 5.31, SE = 0.5), $F(1,107) = 301.57$, $p < .001$, $\eta_p^2 = .74$. As shown in Figure 1, there was a significant main effect of training condition, $F(2,107) = 17.63$, $p < .001$, $\eta_p^2 = .25$, indicating that compared to the control condition, perceivers in the education, $F(1,107) = 18.47$, $p < .001$, $\eta_p^2 = .15$, and education+feedback conditions, $F(1,107) = 32.83$, $p < .001$, $\eta_p^2 = .24$, rated targets as more extraverted. Perceivers’ ratings in the education and education+feedback conditions did not differ significantly, $F(1,107) = 2.21$, $p = .14$, $\eta_p^2 = .02$, although the

[1]It may be argued that this analysis was underpowered and that severe targets might be less extraverted than mild targets. Thus, a finding that perceivers rate severe targets as less extraverted than mild targets may be a correct recognition of differences extraversion between these groups. To ensure this was not the case, we repeated our bias analyses controlling for targets’ self-reported extraversion, and the same pattern and significance of results emerged.

[2]It was possible that perceivers’ bias or accuracy improved over the course of the study due to practice or feedback. In order to test this, we also conducted the ANOVAs above with the addition of *part* as a repeated measures factor. The first 13 trials of the study were considered part 1, and the remaining 14 were considered part 2. There was no effect of part (F's < 1.51, p's < .22), and the remaining factors showed the same pattern and significance of results. Thus, we report the ANOVA examining all trials.

means were in the expected direction. Thus, our second hypothesis was supported because both training interventions reduced bias. There was no interaction of severity by condition, $F(2,107) = .38$, $p = .68$, $\eta_p^2 = .01$, indicating that, contrary to our third hypothesis, training did not specifically improve ratings of severe targets.

3.2 Accuracy

Table 1 shows mean accuracy coefficients, *SEs*, and 95% CI. Perceivers were accurate at significantly greater than chance levels for all groups. Supporting our first hypothesis, there was a main effect of severity $F(1,107) = 8.74$, $p < .001$, $\eta_p^2 = .08$, indicating that perceivers were less accurate when rating severe targets than mild targets. There was no effect of training condition on perceivers' extraversion accuracy, $F(1,107) = 0.12$, $p = .89$, $\eta_p^2 = .00$, nor was there an interaction of severity by condition on accuracy, $F(1, 107) = 0.53$, $p = .59$, $\eta_p^2 = .01$. Thus, contrary to hypotheses two and three, training did not improve perceivers' accuracy in detecting individual differences in extraversion.

4. Discussion and Conclusion

4.1 Discussion

This is the first study to demonstrate that perceivers are biased and inaccurate when judging extraversion in people with severe relative to mild FP. Similar to previous bias research on happiness in FP [1] and extraversion in PD [3], the effect size between the perceivers' ratings of the extraversion of severe and mild targets was remarkably large. This suggests that people with severe FP are in great danger of being viewed as disinterested in socializing. Similarly, perceivers were less accurate when judging extraversion in severe compared to mild targets. However, perceivers displayed some accuracy, as they were able to detect individual differences in extraversion at levels significantly above chance for both groups. Their accuracy, particularly for mild targets, approached accuracy levels for extraversion recognition in the typical population, which generally range from $r = .40$-0.51 [17,19,34].

Training significantly reduced bias when forming impressions of targets. The addition of feedback to education did not significantly improve interpersonal sensitivity, though changes were in the expected direction for bias. These results suggest that education and education+feedback are equally effective or that feedback was not potent enough to produce a significant result. Trainings appeared to improve ratings of targets overall, rather than reducing bias specifically for severe targets. Further, the trainings were not successful in improving perceivers' accuracy, but they were somewhat accurate to begin with, so perhaps improving bias is a more pressing concern than improving accuracy.

The reduction of bias toward targets through education is an important first step which could benefit individuals with FP and guide future research. Although education is not typically effective in improving interpersonal sensitivity, it is helpful in the special case of FP. Education may have reduced prejudice by reducing causal uncertainty, increasing understanding of the nature of the condition, and overriding the tendency to focus primarily on the face. Our pattern of results suggests that education led perceivers to make a conscious effort to reduce their bias, but that it was not successful in improving the more challenging

and perhaps more implicit task of accurately detecting individual differences in targets' extraversion. These findings parallel Kleck's two-factor model of response to disability [35]. When interacting with people with disabilities, people will modify behaviors that are under conscious control to reduce the appearance of prejudice. However, behaviors that are not readily under conscious control often remain negatively biased.

Certainly, this early attempt to improve interpersonal sensitivity towards people with FP is not without limitations. We chose a thin slice paradigm involving short video clips [20]. Thin slice judgments have predictive validity in a variety of contexts [20,36]. People typically form extraversion judgments quickly and accurately, and they are unlikely to change appreciably over time. It could be argued that people might form better impressions of people with FP if they spent more time gathering information before making a judgment. Indeed, encouraging this may be a worthwhile approach to examine in future research.

It may be argued that the bias reduction could be attributed to demand characteristics from the education text. However, perceivers were not instructed to rate all targets as more extraverted. Education emphasized FP symptoms and focusing on compensatory channels. Indeed, perceivers in the education+feedback condition received feedback that indicated certain targets were introverted. Thus, in this condition, training information could not be interpreted as eliciting demand characteristics to rate all targets as more extraverted. The finding that the education and education+feedback groups did not significantly differ in bias ratings suggests that our findings are due to more than just demand characteristics.

Further research is needed to advance trainings to improve accuracy and bias. Given the early promise of education, creating more extensive education may be useful. The education in the present study was designed to provide general information that would apply to many different types of FP. We avoided specific instructions for different types of FP (i.e. unilateral or bilateral) because we were concerned that perceivers would become preoccupied with "diagnosing" targets, rather than focusing on the most informative channels. Future studies could whether more detailed instructions such as focusing on the expressive portion of a partially paralyzed face in addition to the body and voice, are effective. Further, the addition of an attention check could ascertain which parts of the education are well-attended. Eyetracking research could examine whether instructing perceivers to focus on compensatory channels actually changes gaze patterns, and whether this is related to bias and accuracy. It is likely that interpersonal sensitivity trainings for extraversion could be extended to happiness as well because both of these social attributes are signaled with a smile [14–16].

Although the perceivers in this study were students, it is likely that healthcare practitioners could also benefit from the training. People with FP often note that their doctors are not familiar with FP and its ramifications, and even those who are are unlikely to be able to override the tendency to form negative impressions of sociability [3]. An interactive patient-provider communication study could train practitioners to ask questions that increase patient expressivity [37] and pose follow-up questions that provide naturalistic feedback about a patient's personality.

4.2 Conclusion

This experiment demonstrated that interpersonal sensitivity trainings led perceivers to form significantly less biased impressions of people with FP compared to perceivers who did not receive training. Education about this poorly understood condition is valuable as a first step to improve first impressions.

4.3 Practice Implications

By attempting to reduce stigma at the societal level, this training is consistent with the social model of disability [9]. It takes the onus off the person with the disability and places it on society, including the clinicians who define the person's disability. The information from the education condition could be developed into a pamphlet as a way to reduce bias against people with FP or other facial movement disorders such as PD, burns, and hemifacial microsomia. No such resource exists. Such a pamphlet could be distributed to people likely to interact with these populations such as healthcare providers, educators, and employers. This information should also be included in broader disability awareness campaigns.

Additionally, healthcare providers working with FP can counsel their patients to advocate for themselves using this educational information. In light of this research and other evidence that disclosing one's disability can reduce stigma, particularly when it is disclosed early and the condition is perceived to not be the individuals' fault [38,39], it may be useful for people with FP to use this information to educate their healthcare providers, employers, friends, and the general public.

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Appendix

Education Text for Training Study

In everyday life, when we meet new people, we form first impressions of their personalities very quickly. Without even thinking about it, we often rely heavily on *nonverbal behaviors* when forming impressions about the emotions someone is feeling. We especially rely on how people's faces change in response to what's happening during a conversation. We pay attention to whether people do things like smiling, frowning, and raising or furrowing their eyebrows.

Generally, this works well. The problem comes when we meet someone who cannot move his or her face normally, like someone with facial paralysis. Some people are born with facial paralysis, and others acquire facial paralysis from conditions such as Bell's palsy, stroke, or nerve damage. Facial paralysis ranges in severity—some people have only slight paralysis on one or both sides of their faces, and others' faces are completely paralyzed.

People with facial paralysis may experience:

- No facial expression
- Asymmetrical facial expressions
- Speech difficulty due to paralyzed lips
- Inability to blink or difficulty blinking
- Sagging skin due to low muscle tone.

The perspective of a person with facial paralysis: “Try as I might, I can't move my face to reflect my state of mind. I often appear unfriendly on the outside while actually smiling on the inside.”

People with facial paralysis compensate for their lack of facial expression by expressing themselves with their body language, posture, gestures, tone of voice, and their words, rather than with their faces.

So when trying to form impressions about their personalities, PAY ATTENTION TO their body language, gestures, tone of voice, and their words. Pay LITTLE OR NO attention to their faces or the extent to which their faces are expressionless, asymmetrical, or saggy, because these are simply symptoms of facial paralysis.

References

1. Bogart KR, Tickle-Degnen L, Ambady N. Communicating without the face: Holistic perception of emotions of people with facial paralysis. Basic Appl Soc Psychol. 2014; 36:309–20.
2. Hemmesch AR, Tickle-Degnen L, Zebrowitz LA. The influence of facial masking and sex on older adults’ impressions of individuals with Parkinson's disease. Psychol Aging. 2009; 24:542–9. [PubMed: 19739910]
3. Tickle-Degnen L, Lyons KD. Practitioners’ impressions of patients with Parkinson's disease: the social ecology of the expressive mask. Soc Sci Med. 2004; 58:603–14. [PubMed: 14652056]
4. Bleicher JN, Hamiel S, Gengler JS, Antimarino J. A survey of facial paralysis: etiology and incidence. Ear Nose Throat J. 1996; 75:355–8. [PubMed: 8689964]
5. Coulson SE, O'Dwyer NJ, Adams RD, Croxson GR. Expression of emotion and quality of life after facial nerve paralysis. Otol Neurotol. 2004; 25:1014. [PubMed: 15547436]
6. Zuker RM, Goldberg CS, Manktelow RT. Facial animation in children with Mobius syndrome after segmental gracilis muscle transplant. Plast Reconstr Surg. 2000; 106:1. [PubMed: 10883605]
7. Bessell A, Brough V, Clarke A, Harcourt D, Moss TP, Rumsey N. Evaluation of the effectiveness of Face IT, a computer-based psychosocial intervention for disfigurement-related distress. Psychol Health Med. 2012; 17:565–77. [PubMed: 22313169]
8. Robinson E, Ramsey N, Partridge J. An evaluation of the impact of social interaction skills training for facially disfigured people. Br J Plast Surg. 1996; 49:281–9. [PubMed: 8774241]
9. Dunn DS. The Social Psychology of Disability. Handb. Rehabil. Psychol. 2010:379–90.
10. Bogart KR, Tickle-Degnen L, Joffe MS. Social interaction experiences of adults with Moebius Syndrome: A focus group. J Health Psychol. 2012; 17:1212–22. [PubMed: 22257565]
11. Bogart KR. “People are all about appearances”: A focus group of teenagers with Moebius Syndrome. J Health Psychol. 2014:1359105313517277.
12. Bogart KR, Tickle-Degnen L, Ambady N. Compensatory expressive behavior for facial paralysis: Adaptation to congenital or acquired disability. Rehabil Psychol. 2012; 57:43–51. [PubMed: 22369116]

13. Bogart KR. The role of disability self-concept in adaptation to congenital or acquired disability. Rehabil Psychol. 2014; 59:107–15. [PubMed: 24611927]
14. Hall JA, Gunnery SD, Andrzejewski SA. Nonverbal emotion displays, communication modality, and the judgment of personality. J Res Personal. 2011; 45:77–83.
15. Knutson B. Facial expressions of emotion influence interpersonal trait inferences. J Nonverbal Behav. 1996; 20:165–82.
16. Montepare JM, Dobish H. The contribution of emotion perceptions and their overgeneralizations to trait impressions. J Nonverbal Behav. 2003; 27:237–54.
17. Borkenau P, Liebler A. Trait inferences: Sources of validity at zero acquaintance. J Pers Soc Psychol. 1992; 62:645–57.
18. Naumann LP, Vazire S, Rentfrow PJ, Gosling SD. Personality judgments based on physical appearance. Pers Soc Psychol Bull. 2009; 35:1661–71. [PubMed: 19762717]
19. Zebrowitz LA, Collins MA. Accurate social perception at zero acquaintance: The affordances of a Gibsonian approach. Personal Soc Psychol Rev. 1997; 1:204–23.
20. Slepian ML, Bogart KR, Ambady N. Thin-slice judgments in the clinical context. Annu Rev Clin Psychol. 2014; 10:131–53. [PubMed: 24423788]
21. Johnson MH, Dziurawiec S, Ellis H, Morton J. Newborns' preferential tracking of face- like stimuli and its subsequent decline. Cognition. 1991; 40:1–19. [PubMed: 1786670]
22. Langer EJ, Fiske S, Taylor SE, Chanowitz B. Stigma, staring, and discomfort: A novel- stimulus hypothesis. J Exp Soc Psychol. 1976; 12:451–63.
23. Madera JM, Hebl MR. Discrimination against facially stigmatized applicants in interviews: an eye-tracking and face-to-face investigation. J Appl Psychol. 2012; 97:317–30. [PubMed: 22004221]
24. Blanch-Hartigan D, Andrzejewski SA, Hill KM. The effectiveness of training to improve person perception accuracy: a meta-analysis. Basic Appl Soc Psychol. 2012; 34:483–98.
25. Blanch-Hartigan D. An effective training to increase accurate recognition of patient emotion cues. Patient Educ Couns. 2012; 89:274–80. [PubMed: 22906744]
26. Gardiner GS. Complexity training and prejudice reduction. J Appl Soc Psychol. 1972; 2:326–42.
27. Paluck EL, Green DP. Deference, dissent, and dispute resolution: An experimental intervention using mass media to change norms and behavior in Rwanda. Am Polit Sci Rev. 2009; 103:622–44.
28. Schaller M, Asp CH, Roseil MC, Heim SJ. Training in statistical reasoning inhibits the formation of erroneous group stereotypes. Pers Soc Psychol Bull. 1996; 22:829–44.
29. Beck L, Feldman RS. Enhancing children's decoding of facial expression. J Nonverbal Behav. 1989; 13:269–78.
30. Funder DC. On the accuracy of personality judgment: A realistic approach. Psychol Rev. 1995; 102:652–70. [PubMed: 7480467]
31. Gosling SD, Rentfrow PJ, Swann WB. A very brief measure of the Big-Five personality domains* 1. J Res Personal. 2003; 37:504–28. others.
32. House JW, Brackmann DE. Facial nerve grading system. Otolaryngol Neck Surg Off J Am Acad Otolaryngol-Head Neck Surg. 1985; 93:146.
33. Ross BG, Fradet G, Nedzelski JM. Development of a sensitive clinical facial grading system. Otolaryngol Neck Surg. 1996; 114:380–6.
34. Gifford R. A lens-mapping framework for understanding the encoding and decoding of interpersonal dispositions in nonverbal behavior. J Pers Soc Psychol. 1994; 66:398.
35. Kleck R. Physical stigma and task oriented interactions. Hum Relat. 1969; 22:53–60.
36. Ambady N, Bernieri FJ, Richeson JA. Toward a histology of social behavior: Judgmental accuracy from thin slices of the behavioral stream. Adv Exp Soc Psychol. 2000; 32:201–71.
37. Takahashi K, Tickle-Degnen L, Coster WJ, Latham NK. Expressive behavior in Parkinson's disease as a function of interview context. Am J Occup Ther. 2010; 64:484. [PubMed: 20608279]
38. Hebl MR, Kleck RE. Acknowledging one's stigma in the interview setting: Effective strategy or liability? J Appl Soc Psychol. 2002; 32:223–49.
39. Hebl MR, Skorinko JL. Acknowledging one's physical disability in the interview: Does "when" make a difference? J Appl Soc Psychol. 2005; 35:2477–92.

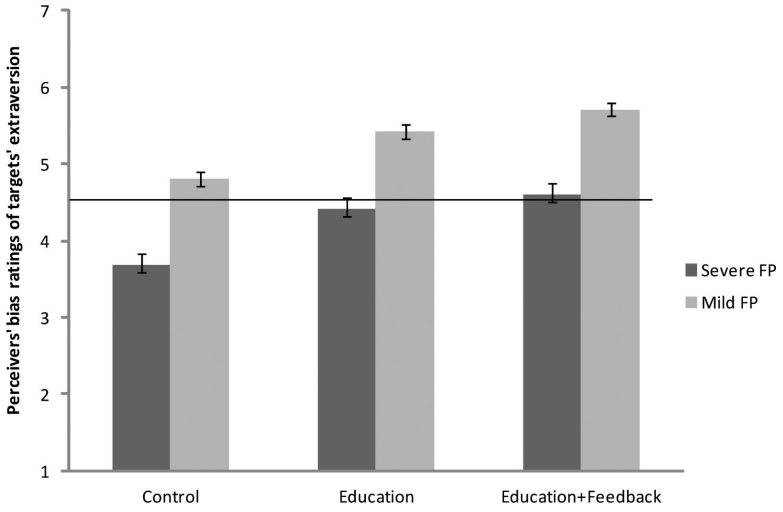

Figure 1.

Effect of training and severity on perceivers' bias in rating extraversion of targets with FP. Error bars represent standard errors. Horizontal line represents targets' mean self-reported extraversion (M = 4.50, SE = 0.36).

Table 1

Perceivers' Extraversion Accuracy Coefficients

				95% CI	
Condition	**Severity**	***M* Pearson *r***	***SE***	**Lower**	**Upper**
Control	Severe FP	0.30	0.04	0.22	0.38
	Mild FP	0.44	0.04	0.37	0.52
Education	Severe FP	0.32	0.04	0.24	0.39
	Mild FP	0.40	0.04	0.33	0.47
Education+feedback	Severe FP	0.32	0.04	0.24	0.40
	Mild FP	0.39	0.04	0.32	0.46

Note. Coefficients are shown as Pearson *r*s for ease of interpretation.