

## **On the Consequences of living without facial expression**

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### **Abstract**

Although the importance of the face in communication is well-known, there has been little discussion of the ramifications for those who lack facial expression: individuals with facial paralysis such as Bell's palsy and Möbius syndrome, and facial movement disorders like Parkinson's disease. By examining the challenges experienced by these individuals, this chapter not only highlights the importance of facial expression, but reveals the role of the rest of the body in emotional experience, communication, and interaction. First, the qualitative experiences and psychological adjustment of people with facial paralysis are examined; then applied and theoretical implications of facial paralysis to facial feedback theory, mimicry, and empathy are covered. Next, the tendency for people to form inaccurate impressions of the emotions and traits of people with facial paralysis are discussed. Some people with facial paralysis compensate for their lack of facial expression by increasing expressivity in their bodies and voices. These compensatory expressions may improve impressions of them. Importantly, potential risks of misdiagnosing people with facial paralysis and other facial movement disorders with psychological disorders such as autism, depression, or apathy are considered. This chapter concludes with ways to facilitate social interaction.

## **1. Introduction**

The importance of facial expression in social interaction is well documented; it serves to communicate emotion, initiate and regulate the dynamics of conversation, develop rapport, and build social connectedness (Ekman 1986; Tickle-Degnen 2006). There is, however, little research on the consequences of impoverished facial expression. The face is often regarded as the most salient social communication channel, though we use it with other expressive channels, including the body and voice (Noller 1985). Examining the challenges experienced by people with facial paralysis or palsy not only highlights the importance of facial expression but, crucially, reveals something of the role of the rest of the body in emotional experience, communication, and interaction. This chapter describes the psychological and communicative consequences of facial paralysis, both for people with facial paralysis and for those interacting with them, and ways to facilitate interaction between the two.

### **1.1. Types of facial paralysis**

Facial paralysis is a relatively common disorder with a variety of causes. Bleicher et al. (1996) estimated the incidence of facial paralysis to be 50 cases per 100,000. Facial paralysis can be congenital or acquired, unilateral or bilateral, and complete or incomplete.

Acquired facial paralysis can result from a variety of causes, including idiopathic Bell's palsy, Guillain-Barre Syndrome, Sarcoid, Lyme disease, stroke, and damage to the facial nerve from neoplasms or trauma. Bell's palsy is the most common cause of facial paralysis, affecting 25 people per 100,000 annually (Bleicher et al. 1996). It is usually unilateral and temporary, typically resolving completely within six weeks, though approximately 16% of Bell's palsy cases do not recover or recover incompletely (Peitersen 1992). In some cases, partial recovery is accompanied by synkinesis, an erroneous reinnervation of facial muscles, resulting in abnormal facial movements, e.g. eyelid closure with smiling, as well as facial tightness and pain.

Congenital facial paralysis may result from birth trauma (e.g. from forceps delivery) or prenatal maldevelopments (e.g. Möbius Syndrome or Hemifacial Microsomia). Estimates for the occurrence of congenital facial paralysis vary widely from 2 to 8 per 1,000 births per year (Hughes et al. 1999). Birth trauma is the most common cause of congenital facial paralysis, with 2 per 1000 births (Falco and Eriksson 1990). Möbius Syndrome is a congenital, non-progressive condition characterized by the underdevelopment of the 6th and 7th cranial nerves, resulting in facial paralysis which is most often severe and bilateral, and by impaired lateral movement of the eyes (Briegel 2006; Möbius 1888). It is properly considered a sequence rather than a syndrome, since people may have a wide variety of associated symptoms such as micrognathia and limb and chest wall malformations (Briegel 2006). It is a very rare condition, occurring in 2 births per 100,000 (Verzijl et al. 2003).

Parkinson's disease classically involves impaired movement initiation, rigidity, tremors, and postural instability (Birkmayer and Hornykiewicz 1961). It affects 17 per 100,000 people per year (Twelves, Perkins, and Counsell 2003). Unlike facial paralysis, expressivity in Parkinson's disease is reduced not only in the face but also in the body and voice, resulting in an expressive mask (Tickle-Degnen and Lyons 2004). People with Parkinson's disease and expressive masking are often thought to have become dull, boring, or depressed (Cole 1998; Tickle-Degnen and Lyons 2004).

### **1.2. Physical consequences of facial paralysis**

Facial paralysis results in difficulties in physical functioning. During the first few weeks or months after birth, babies with facial paralysis experience feeding problems due to difficulty in sucking and swallowing (Verzyl et al. 2003). Individuals with facial paralysis may experience dry eyes due to insufficient eyelid closure; drooling saliva or food while eating; and problems with the articulation of labial sounds (Sjögreen, Andersson-Norinder, and Jacobsson 2001), which often results in flaccid dysarthria, a speech disorder found in 20 out of 22 cases of Möbius Syndrome in one study (Meyerson and Foushee 1978). To compensate, labial sounds are often replaced by similar sounds produced by the tongue placement behind, against, or in between, the frontal teeth (Sjögreen, Andersson-Norinder, and Jacobsson 2001). Most children with facial paralysis experience delayed speech development, but, as Meyerson and Foushee (1978) noted, people with facial paralysis usually develop understandable speech with these compensations.

## **2. Experiences of people living with facial paralysis**

Qualitative research on facial paralysis provides a rich background about the experiences of people with facial paralysis. In their book on living without facial expression, Cole and Spalding (2008) gave the biographies of a dozen or so people with Möbius Syndrome. One of the problems of such an approach is that people's experiences differ and are not quantifiable. Some themes, however, emerged. Several people who remembered their childhood felt an emotional disconnection when younger. One woman described how as a child,

I did not do ballet or horse riding; I did hospitals and operations. I had the eye doctor and the foot doctor and a speech therapist, and a face doctor. My limitations were a fact of life. I never thought I was a person; I used to think I was a collection of bits. I thought I had all these different doctors to look after all the different bits. 'Celia' was not there; that was a name people called the collection of bits.

Another woman, now aged 40, who had become more expressive as a teenager and adult learned to use prosody and gesture more, and yet, she says,

All my gesture is voluntary, even now. Everything I do, I think about... With Möbius you have to be so much more wordy and articulate and this requires intelligence and can be hard and tiring. For me the word is stronger than facial expression. Without the word, how to express the feeling? I am interested now in non-facial aspects; gesture and tone of voice. Gesture is part of language, is a language and people with Möbius do not always learn it; they must be taught. As you grow up the social feedback from others has far more meaning than as a child. A meaningful smile from you triggers an emotional response from me. As a teenager I was articulate but this was not sufficient.

Thus far we have focused on emotional expression and communication. But two other aspects of living with Möbius must be considered; education and relationships. The parents of one UK teenager, Gemma, were interviewed. Gemma is in the top stream of an excellent school and obviously very bright and motivated. Yet with her Möbius came severe visual, hearing and speech problems. To reach her potential she has needed not only medical and audiological assistance but speech and language therapists, special needs teachers, well briefed mainstream teachers and, above all, the tireless advocacy of her parents for her to receive her rights. One hopes others will be as fortunate.

Lastly, intimacy may be difficult for someone who experiences stigma of facial difference. Since attraction is often based on the face, initially at least, those with visible difference can be disadvantaged. One man with Möbius Syndrome, in his 50's, related, "The hardest thing for me to do in my whole life is to take the risk of being physical with a woman. I am petrified of the fear of being rejected. Between dates I was so wounded."

Despite the challenges of facial paralysis, many people with the condition are personally and professionally successful. Meyerson (2001) collected qualitative interviews from 18 such individuals with Möbius Syndrome. Participants' sources of strength included family support, faith, humor, sense of self, special skills, determination, and networking, a similar list to that of most people. Participants reported using eye contact to signal confidence and using gestures, vocal prosody, and verbal disclosure to communicate emotion. They reported that their friends and family were able to see the person behind the paralysis and recognize their emotions without difficulty; people can learn to focus on channels other than the face when interacting with people with facial paralysis.

Bogart, Tickle-Degnen, and Joffe (2012) conducted a focus group with 12 adults with Möbius Syndrome. Participants felt their social interactions were mostly positive but reported negative experiences resulting from social stigma and people misunderstanding their facial expressions or speech. Five factors influencing their social interaction experiences were resilience/sensitivity, social engagement/disengagement, social support/stigma, being understood/misunderstood, and public awareness/lack of awareness of Möbius Syndrome. Participants reported using compensatory expressive strategies including the voice to convey emotion, gestures, touch to create personal closeness, clothing to express personality, and humor. Möbius Syndrome is a particularly stigmatizing disability because it involves an inexpressive face, giving the person the appearance of a lack of emotion or intelligence, leading to hesitancy in initiating interaction.

### **3. Emotional consequences of facial paralysis**

Darwin ([1872] 1998) theorized that facial expression of emotion evolved in animals and humans due to its adaptive signalling value. A large body of research now suggests the existence of universal facial expressions of emotion (e.g. anger, contempt, disgust, fear, happiness, sadness, and surprise) produced and recognized across nearly all cultures (Ekman, Sorenson, and Friesen 1969). Consequently, facial paralysis leaves individuals unable to communicate using one of the only universal languages (Ekman 1986).

#### **3.1. Facial feedback hypothesis**

The facial feedback hypothesis contends that facial expression is necessary or sufficient to experience emotion (Izard 1971; Tomkins 1962, 1963). Several studies have suggested that facial expression is sufficient to generate or modulate emotional experience. In a classic study of this hypothesis, participants held pens in their mouths in a way that either inhibited or facilitated smiling (Strack, Martin, and Stepper 1988). When they read comic cartoons, the people whose smiles were facilitated found the cartoons funnier than those whose smiles were inhibited. In another study, people receiving facial Botox injections (resulting in temporary partial facial paralysis), viewed emotionally evocative video clips and rated their emotional reaction (Davis et al. 2010). Relative to controls, participants who received Botox did not differ in their emotional reaction to strongly negative or positive videos but showed a decrease in their emotional reaction to mildly positive stimuli. The authors concluded that facial feedback may subtly modulate emotional experience. There has been less support for the strong version of the hypothesis, which suggests that facial expression is necessary to feel emotion. Levenson and Ekman (in preparation) presented emotionally evocative videos to 10 individuals with Möbius Syndrome, and measured their physiologic responses (e.g. galvanic skin response and heart rate) and self-reported emotional experience. Participants with Möbius Syndrome showed a normal pattern of

physiological responses to the emotional stimuli and a normal intensity of emotion experience compared to controls. This study provides evidence that, for people with Möbius Syndrome, facial feedback is not necessary to experience emotion. People with congenital facial paralysis may have adapted to retain intact emotional experience without facial movement in ways that those with temporary loss of movement have not.

### **3.2. Expressive mimicry**

People naturally and automatically mimic each other's facial expressions, body movements, and vocal attributes (Chartrand and Bargh 1999). According to one theory, the reverse simulation model of embodiment, people recognize facial expressions by implicitly mimicking observed expressions, in turn generating the corresponding emotional experience in the observer (Goldman and Sripada 2005). Researchers have attempted to inhibit participants' facial movement (e.g. by having participants hold pens in their mouths) and found that this reduced their emotion recognition ability (Neidenthal et al. 2001; Oberman and Ramachandran 2007). However, these manipulations were potentially distracting, and studying people with facial paralysis seems a better test of this theory. Calder et al. (2000) studied 3 individuals with Möbius Syndrome and found they exhibited normal ability on a facial expression recognition task. In a more challenging task involving recognition of morphed expressions, one individual showed impairments. In a larger follow-up study, Bogart and Matsumoto (2010a) examined the ability of 37 people with Möbius Syndrome to recognize facial expressions compared to 37 age and gender matched controls. People with Möbius Syndrome did not differ from the control group or normative data in emotion recognition accuracy. Among people with Möbius Syndrome, facial mimicry is not necessary for facial expression recognition. The difference in findings between the Möbius Syndrome studies and the artificially inhibited movement studies may reflect the potentially distracting manipulations used in the artificial studies, but it is also possible that people with Möbius Syndrome are able to perform normally because they have adapted to their condition. It would be interesting to compare the emotion experience and recognition abilities of people with congenital and acquired facial paralysis, but to our knowledge, there has only been one study of emotion in acquired facial paralysis (Keillor et al. 2002). No evidence for reduced emotional experience or facial expression recognition ability was found.

Mimicry is crucial for empathy; it helps people to understand another's emotions, and it communicates that understanding. Embodiment theories propose that facial feedback from mimicry of others' expressions generates emotion in the mimicker, resulting in emotional convergence (Goldman and Sripada 2005). As Merleau-Ponty (1964) suggested, "I live in the facial expression of the other, as I feel him living in mine." This raises the possibility that empathy may be a challenge for people with facial paralysis to receive, convey, or experience, for

reasons including stigmatization of facial difference, difficulty communicating emotion, and a possible difficulty recognizing and embodying others' emotions (Cole 2001). We suggest here that the primary breakdown of empathy for those with facial paralysis is the inability of others to recognize the facial expressions of people with facial paralysis. The research described above provides evidence that people with facial paralysis have normal emotional experience and emotion recognition ability. People with facial paralysis are able to feel empathy, but, without facial expression, they will not appear empathetic. Furthermore, it may be difficult for others to feel empathetic towards someone with facial paralysis, since there is no facial expression for them to mimic. In this way, facial paralysis can be a source of a major emotional disconnect.

### **3.3. Channels of expression**

Although facial expression plays an important role in emotion and social interaction, people also use other expressive channels to communicate (Noller 1985), including the body (e.g. gestures, posture, proximity) and the voice (e.g. prosody, language). Usually, these channels play a supporting role to the face in expression; however, for people with facial paralysis, these may become their primary modes of expression, their compensatory expressive channels. Some people compensate for their facial paralysis by increasing their use of these channels (Bogart, Tickle-Degnen, and Ambady 2012). In fact, Cole and Spalding (2008) suggested that since people with Möbius Syndrome are unable to develop emotional embodiment through the face, they may compensate by “bootstrapping” their emotional embodiment with compensatory expression through gesture and voice.

## **4. Psychological consequences of facial paralysis**

A paralyzed face is a disfigured face, both in motion and at rest. Facial paralysis results not only in an absence of appropriate facial expression but also in loss of muscle tone and wrinkling. Often, in acquired facial paralysis, the face may be asymmetrical, with expression evident on only one side of the face. The smile of a person with unilateral facial paralysis is often not recognizable as a smile, rather it may resemble a sneer, and to reduce this, people may try to decrease their facial movement. Due to a lack of muscle tone, the face may sag, especially around the eyes and the mouth, giving the appearance of sadness when, ironically, no expression exists. Facial disfigurement is one of the most stigmatizing of disabilities (Macgregor 1990); studies of those with acquired or congenital disfiguring conditions have found unusually high rates of depression and anxiety (Rumsey et al. 2004).

Those with congenital facial paralysis have lived their entire lives without facial expression; in contrast, people with acquired facial paralysis must relearn to communicate without their face and adjust to others' changed reactions to them. Therefore, it is possible that people with

congenital facial paralysis may be better adapted than people with acquired facial paralysis. There is a dearth of research on the psychological consequences of facial paralysis. Most studies have been small and have included people with a variety of types of facial paralysis. As acquired facial paralysis is far more common than congenital, research has been dominated by the former.

#### **4.1. Studies of acquired facial paralysis**

People with acquired facial paralysis have high levels of psychological distress such as anxiety and depression (Neely and Neufeld 1996; VanSwearingen and Brach 1996; VanSwearingen et al. 1998; VanSwearingen, Cohn, and Bajaj-Luthra 1999). VanSwearingen, Cohn, and Bajaj-Luthra (1999) found that a specific impairment in smiling in people with facial paralysis predicted depression, even when controlling for overall impairment and disability. It is unclear whether the relationship between impairment of smiling and depression resulted from an endogenous cause (i.e. a lack of facial feedback) or an exogenous cause (i.e. lack of positive social feedback from others).

#### **4.2. Studies of congenital facial paralysis**

There have been only a few studies that have examined psychological adjustment in people with congenital facial paralysis (Bogart and Matsumoto 2010b; Briegel 2007; Briegel, Hofmann, and Schwab 2007; Briegel, Hofmann, and Schwab 2010). In the first study on psychopathology and personality aspects of subjects with Möbius Syndrome aged 17 years or older, Briegel (2007) examined 22 out of 29 adults known to the German Möbius Syndrome Foundation. Eight had a psychiatric diagnosis (predominantly major depression), and 6 participants had suicidal thoughts. According to the Derogatis Symptom Checklist Revised (Derogatis 1977), 7/20 subjects met criteria of a clinical case. Participants had a non-significant tendency towards greater depression and anxiety than the general population. Compared to the general population, subjects with Möbius Syndrome showed increased interpersonal sensitivity and inhibitedness. Their life satisfaction, achievement orientation, and extraversion were significantly reduced. The study suggested that adults with Möbius Syndrome and normal intelligence are at high risk of developing psychiatric disorders (especially major depression) and an introverted personality, likely because they experience more social rejection and fewer positive interactions.

In contrast, in the largest psychology study of Möbius Syndrome to date, Bogart and Matsumoto (2010b) examined self-reported measures of anxiety, depression, social functioning, and satisfaction with life (using the Hospital Anxiety and Depression Scale, Zigmond and Snaith 1983, and the Texas Social Behavior Inventory, Helmreich and Stapp 1974) in a US sample of 37 adults, compared to 37 age and gender matched control participants without facial paralysis, and normative data. The only significant difference was that the Möbius group reported lower social

functioning. People with Möbius Syndrome in this study did not have increased levels of depression, anxiety, or decreased levels of satisfaction with life compared to the general population.

Briegel et al. (2010) studied 31 children with Möbius Syndrome aged 4-17, using the Child Behavior Checklist (CBCL) 4-18 (Arbeitsgruppe Deutsche Child Behavior Checklist 1991). Parents reported frequent social problems (12.9 % vs. 2 % in the normative sample) especially among adolescents (25%) compared with children (5.3 %). However, the self-rated social problems of children with Möbius Syndrome were more positive than their caregivers' ratings (Briegel in press).

#### **4.3. Interpreting these findings**

In both studies examining social functioning in Möbius Syndrome, difficulties were found (Bogart and Matsumoto 2010b; Briegel et al. 2010). But while Briegel's (2007) study showed a non-significant trend towards increased depression compared to normative data, Bogart and Matsumoto (2010b) found no differences between people with Möbius and a matched control group or normative data. These different results may reflect several factors, for example, differences in measures, culture, sample size, and caregiver vs self-report. Bogart and Matsumoto's (2010b) study was conducted with an American sample, while Briegel's study was conducted with a German one. There are cultural differences in the stigma ascribed to disability and visible difference (Yang et al. 2007), and this may affect the adjustment of an individual living in that culture. Bogart's study was also larger sample size, and had a more robust design due to the inclusion of a matched-control group.

The range of adjustment found in the studies described show that reactions to facial paralysis vary widely: some people have problems such as depression and anxiety, while others are quite resilient. Future research should examine further the sources of resilience in facial paralysis and consider ways of assisting those with problems in this area.

#### **5. Expressive behavior of people with facial paralysis**

Though social functioning problems seem common among people with congenital and acquired facial paralysis (Bogart and Matsumoto 2010b; Briegel et al. 2010), they may adapt by using compensatory expressivity. In the first behavioral study of facial paralysis, Bogart, Tickle-Degnen, and Ambady (2012) examined whether people with congenital facial paralysis, who have been adapting to facial paralysis their entire lives, display more compensatory expressivity compared to those with acquired facial paralysis (onset averaging 12 years prior). People with facial paralysis were videotaped while interviewed about emotional events in their lives. During standardized points in the interview, their emotional language was analyzed using the Linguistic

Inquiry Word Count (Pennebaker, Booth, and Francis 2007) and their nonverbal expressivity was rated by trained coders. As hypothesized, people with congenital facial paralysis were more expressive in their bodies, voices, and emotional language. Indeed, during his interview, a man with Möbius Syndrome reported using compensatory expression: “The tone, the volume, the rate, the timbre of the voice, and body language, I use to supplement in ways that my face can’t provide [...] I have a whole repertoire of laughs that I use to respond to different situations.”

## **6. Social perception of people with impoverished facial expression**

It is important to consider the way others perceive people with facial paralysis, as this is one of the main determinants of their social functioning. In everyday life, people form first impressions about others’ interpersonal attributes quickly and automatically (Ambady and Rosenthal 1992). When participants are shown short episodes of behavioral information, e.g. a short video, a “thin slice”, they can make accurate judgments about a person’s emotions, personality, competence, and many other social outcomes (Ambady and Rosenthal 1992). People rely heavily on the face when forming these impressions, so when the signal quality of the face is poor due to facial paralysis or Parkinson’s disease, their impressions are inaccurate (Bogart, Tickle-Degnen, and Ambady, 2014; Tickle-Degnen and Lyons 2004). In fact, people with facial paralysis report being particularly concerned by strangers’ first impressions of them (Bogart, Tickle-Degnen, and Joffe 2012). They reported being mistaken as sad, unfriendly, or even intellectually disabled.

The way people form impressions of people with facial paralysis and Parkinson’s disease has been examined experimentally using a thin slice design involving videotaped interviews (Bogart, Tickle-Degnen, & Ambady, 2014; Hemmesch, Tickle-Degnen, and Zebrowitz 2009; Tickle-Degnen and Lyons 2004). Various social perceivers, including healthcare professionals, psychology undergraduates, and older adults, viewed clips as short as 20 s and rated their impressions of the people. Perceivers, when viewing more severe facial paralysis or expressive masking, were inaccurate and negatively biased when rating attributes such as emotion, likeability, and personality traits such as extraversion and neuroticism.

People with facial paralysis, unlike people with Parkinson’s disease, can compensate for their lack of facial expression with their bodies and voices. Bogart, Tickle-Degnen, and Ambady (2014) found that perceivers rated people with facial paralysis who used a high amount of compensatory expression more positively than those who used less, regardless of the severity of their facial paralysis. So, these behaviors can improve the accuracy of perceivers’ impressions and reduce misunderstandings. Additionally, this suggests that perceivers integrate emotional information from various channels (e.g. face, body, voice) in a holistic manner, rather than focusing on only the face.

## **7. Misdiagnosing people with impoverished facial expression**

One of the most serious consequences of the tendency to form inaccurate impressions of people with impoverished facial expression is the potential misdiagnosis of psychological conditions like intellectual disability, autism, depression, and apathy in these individuals. Flat affect may indicate depression in the typical population, but this cannot be used in people with facial paralysis or Parkinson's disease. An unresponsive face and speech difficulties also put people at risk for being mistaken as intellectually disabled. If this occurs early on it may result in different socialization and education, and subsequent disparities in future opportunities for children with facial paralysis. Researchers have found incidences of intellectual disability (which is usually mild) between 0 % (Ghabrial et al. 1998; Verzijl, Padberg, and Zwarts 2005) and 75% (Briegel 2006). In spite of this large range, intellectual disability is usually estimated to occur in about 10-15 % of individuals with Möbius Syndrome (Kuklik 2000; Johansson et al. 2001). In many studies, especially earlier ones, conclusions have not been based on standardized intelligence tests whilst in others heterogeneous and non-equivalent tests have been used. Both Verzijl, Padberg, and Zwarts (2005) and Briegel et al. (2009), who found a 0–9 % incidence of intellectual disability, pointed out that intelligence tests which are less dependent on time constraints should be preferred for subjects with Möbius Syndrome; otherwise neurological and physical disabilities could cause falsely low results.

Similarly, researchers have found rates of autism in Möbius Syndrome ranging widely from 0 % to 29% (Bandim et al. 2003; Briegel et al. 2009; Briegel et al. 2010; Gillberg and Steffenburg 1989; Johansson et al. 2001; Verzijl et al. 2003). There are several possible explanations for the wide range of reported incidence. Generally, diagnosing autistic disorders in Möbius patients is very challenging. Möbius Syndrome can impose social interaction difficulties which may be mistaken for symptoms of autism, including impaired facial expression, eye-to-eye gaze, difficulty in developing peer relationships, and lack of social or emotional reciprocity. Other diagnostic difficulties result from developmental delays, especially speech and language delays, and – most of all – concomitant intellectual disability. Of the three major categories of diagnostic criteria for autism according to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association 2000), (impairment in social interaction, delayed speech, and restricted repetitive stereotyped behaviour), the first two might, at least in part, be accounted for by the physical symptoms of Möbius Syndrome. Therefore, the younger the patient, the more difficult it is to make a diagnosis of autism spectrum disorder (Briegel 2006). Additionally, there are methodological problems in several studies: lack of information about diagnostic instruments used (Verzijl et al. 2003) and, most of all, overrepresentation of intellectual disability (Bandim et al. 2003; Briegel 2006; Gillberg and Steffenburg 1989). In the most recent and methodologically

best study, with 22 participants aged 6–16 years, who all underwent a physical and psychological examination, none of the participants fulfilled diagnostic criteria of autism spectrum disorder on a clinical consensus conference, indicating that Möbius Syndrome is less frequently associated with autism spectrum disorder than formerly thought (Briegel et al. 2010). Throughout 6 studies worldwide with a total of 132 Möbius patients included, there has been a secured diagnosis of autism spectrum disorder in 18 patients, and 17 of 18 had intellectual disabilities. Therefore, Briegel (2006) concluded that only one association could undoubtedly be shown: the association of autism with intellectual disability which is already well known.

Cole (1998) warned of the potential of misdiagnosing people with Parkinson's disease due to their expressive masking. There have been nearly 30 studies reporting high rates of apathy in people with Parkinson's disease, a symptom or syndrome characterized by a lack of motivation or goal-seeking behaviour. In a review of this research, Bogart (2011) suggested that people with Parkinson's disease are likely to be misperceived as apathetic due to, among other reasons, their expressive masking symptoms.

We caution readers to avoid the tendency to view people with impoverished facial expression as having psychological disorders. When diagnosing individuals, clinicians and researchers should rely on information other than the face such as the body and voice (in facial paralysis) and the content of the persons' speech. Caution should be used when diagnosing young children with facial paralysis with these conditions. Because of the symptoms associated with facial paralysis, they should be allowed more time to reach developmental milestones.

## **8. Facilitating social interaction with facial paralysis**

We have shown that though there are serious social consequences of facial paralysis, people can compensate for their lack of facial expression, and people interacting with those with facial paralysis can look beyond the face to perceive expression holistically. Social functioning can be facilitated by encouraging those with facial paralysis to use compensatory expression, particularly children who may not have developed these adaptations yet or people who have recently acquired facial paralysis, and by training social perceivers to focus on these expressive channels. Fischman et al. (2011) conducted a pilot study in which perceivers were trained to look beyond the expressive mask of Parkinson's disease to focus on the content of the person's speech. The results were promising: after training, perceivers' impressions of the personalities of people with Parkinson's disease were more positive. Such training may be particularly useful for family members, teachers, and healthcare practitioners of people with these conditions.

## 9. Conclusions

Throughout this chapter, we have presented evidence suggesting that the primary barrier to social functioning with facial paralysis is others' difficulty recognizing the expressions of people with facial paralysis and the stigma associated with the condition. Some people with facial paralysis may need help to develop ways of managing other's responses to them, whilst those who interact with people with facial paralysis need to tune into those other clues. Greater public awareness about facial paralysis may help reduce stigma and peoples' hesitancy to interact with them. More broadly, this chapter has highlighted the importance of the face for emotional communication, empathy, and social connectedness while demonstrating the role of the whole body in communication and social perception.

## 10. References

- Ambady, Nalini and Robert Rosenthal 1992 Thin slices of expressive behavior as predictors of interpersonal consequences: A meta-analysis. *Psychological Bulletin* 111(2): 256–274.
- American Psychiatric Association 2000 *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*. Washington, D.C.: American Psychiatric Association.
- Arbeitsgruppe Deutsche Child Behavior Checklist 1998 *Elternfragebogen über das Verhalten von Kindern und Jugendlichen: deutsche Bearbeitung der Child Behavior Checklist (CBCL/4–18). Einführung und Anleitung zur Handauswertung*. 2. Auflage mit deutschen Normen bearbeitet von Manfred Döpfner, Julia Plück, Sven Bölte, Klaus Lenz, Peter Melchers and Klaus Heim. Köln: Arbeitsgruppe Kinder-Jugend- und Familiendiagnostik (KJFD).
- Bandim, Jose, Liana Ventura, Marilyn Miller, Henderson Almeida and Ana Costa 2003 Autism and Mobius sequence: an exploratory study of children in northeastern Brazil. *Arquivos Neuro-Psiquiatria* 61:181–185.
- Birkmayer, Walter and Oleh Hornykiewicz 1961 The L-3,4-dioxyphenylalanine (DOPA)-effect in Parkinson-akinesia. *Wiener Klinische Wochenschrift* 73:787–788.
- Bleicher, Joel, Steve Hamiel, Jon Gengler and Jeff Antimarino 1996 A survey of facial paralysis: Etiology and incidence. *Ear, Nose and Throat Journal* 75(6): 355–358.
- Bogart, K. R., Tickle-Degnen, L., & Ambady, N. (2014). Communicating without the face: Holistic perception of emotions of people with facial paralysis. *Basic and Applied Social Psychology*, 36 (4), 309-320.
- Bogart, Kathleen Rives, Linda Tickle-Degnen and Nalini Ambady 2012 Compensatory expressive behavior for facial paralysis: Adaptation to congenital or acquired disability. *Rehabilitation Psychology* 57(1): 43–51.

- Bogart, Kathleen Rives, Linda Tickle-Degnen and Matthew Joffe 2012 Social interaction experiences of adults with Moebius syndrome: A focus group. *Journal of Health Psychology* 17(8): 1212–1222.
- Bogart, Kathleen Rives 2011 Is apathy a valid and meaningful symptom or syndrome in Parkinson's disease? A critical review. *Health Psychology* 30(4), 386–400.
- Bogart, Kathleen and David Matsumoto 2010a Facial mimicry is not necessary to recognize emotion: Facial expression recognition by people with Moebius syndrome. *Social Neuroscience* 5(2): 241–251.
- Bogart, Kathleen Rives and David Matsumoto 2010b Living with Moebius syndrome: Adjustment, social competence, and satisfaction with life. *Cleft Palate-Craniofacial Journal* 47(2): 134–142.
- Briegel, Wolfgang 2006 Neuropsychiatric findings of Mobius sequence: a review. *Clinical Genetics* 70: 91–97.
- Briegel, Wolfgang 2007 Psychopathology and personality aspects of adults with Mobius sequence. *Clinical Genetics* 71(4): 376–377.
- Briegel, Wolfgang, Christina Hofmann and K. Otfried Schwab 2007 Moebius sequence: behaviour problems of preschool children and parental stress. *Genetic Counseling* 18(3): 267–275.
- Briegel, Wolfgang, Martina Schimek, Inge Kamp-Becker, Christina Hofmann and K. Otfried Schwab 2009 Autism spectrum disorders in children and adolescents with Moebius sequence. *European Child and Adolescent Psychiatry* 18(8): 515–519.
- Briegel, Wolfgang, Martina Schimek, Dirk Knapp, Roman Holderbach, Patricia Wenzel and Eva-Maria Knapp 2009 Cognitive evaluation in children and adolescents with Mobius sequence. *Child: Care, Health and Development* 35(5): 650–655.
- Briegel, Wolfgang, Christina Hofmann and K. Otfried Schwab 2010 Behaviour problems of patients with Moebius sequence and parental stress. *Journal of Paediatrics and Child Health* 46(4): 144–148.
- Briegel, Wolfgang, Martina Schimek and Inge Kamp-Becker 2010 Moebius sequence and autism spectrum disorders – Less frequently associated than formerly thought. *Research in Developmental Disabilities* 31(6): 1462–1466.
- Calder, Andrew, Jill Keane, Facundo Manes, Nagui Antoun and Andrew Young 2000 Impaired recognition and experience of disgust following brain injury. *Nature Neuroscience* 3(11): 1077–1078.
- Chartrand, Tanya and John Bargh 1999 The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology* 76(6): 893–910.

- Cole, Jonathan 1998 *About Face*. Massachusetts: The Massachusetts Institute of Technology Press.
- Cole, Jonathan 2001 Empathy needs a face. *Journal of Consciousness Studies* 8(5–7): 51–68.
- Cole, Jonathan and Henrietta Spalding 2008 *The Invisible Smile*. Oxford/New York: Oxford University Press.
- Darwin, Charles 1998 *The Expression of Emotion in Man and Animals*. New York: Oxford University Press. First published [1872].
- Davis, Joshua, Ann Senghas, Fredric Brandt and Kevin Oshsner 2010 The effects of BOTOX injections on emotional experience. *Emotion* 10(3): 433–440.
- Derogatis, Leonard 1977 *SCL-90-R, Administration, Scoring and Procedures Manual-I for the R(vised) Version*. Baltimore: Johns Hopkins University School of Medicine.
- Ekman, Paul, E. Richard Sorenson and Wallace V. Friesen 1969 Pan-cultural elements in facial displays of emotion. *Science* 164(3875): 86–88.
- Ekman, Paul 1986 Psychosocial aspects of facial paralysis. In: Mark May (ed.), *The Facial Nerve*. New York: Thieme.
- Falco, N. and E. Eriksson 1990 Facial nerve palsy in the newborn: incidence and outcome. *Plastic and Reconstructive Surgery* 85(1): 1–4.
- Fischman, Cara, Christine George, Ashley Glasser, Jessica May, Wen Wei and Kathleen R. Bogart 2011 Can practitioners see beyond symptoms of Parkinson's disease? Poster presentation, Massachusetts Association for Occupational Therapy Conference, Norwood, MA.
- Ghabrial, R., P. Versace, G. Kourt, A. Lipson and F. Martin 1998 Möbius' Syndrome: features and etiology. *Journal of Pediatric Ophthalmology and Strabismus* 35(6): 304–311.
- Gillberg, Christopher and Suzanne Steffenburg 1989 Autistic behaviour in Moebius Syndrome. *Acta Paediatrica Scandinavica* 78: 314–316.
- Goldman, Alvin I. and Chandra Sripada 2005 Simulationist models of face-based emotion recognition. *Cognition* 94(3): 193–213.
- Helmreich, Robert and Joy Stapp 1974 Short forms of the Texas Social Behavior Inventory (TSBI), an objective measure of self-esteem. *Bulletin of the Psychonomic Society* 4(5A): 473–475.
- Hemmesch, Amanda R., Linda Tickle-Degnen and Leslie A. Zebrowitz 2009 The influence of facial masking and sex on older adults' impressions of individuals with Parkinson's disease. *Psychology and Aging* 24(3): 542–549.
- Izard, Carroll E. 1971 *The Face of Emotion*. New York: Appleton-Century-Crofts.

- Johansson, Maria, Elisabet Wentz, Elisabeth Fernell, Kerstin Stromland, Marilyn Miller and Christopher Gillberg 2001 Autistic spectrum disorders in Mobius sequence: a comprehensive study of 25 individuals. *Developmental Medicine and Child Neurology* 43(5): 338–345.
- Keillor, Jocelyn, Anna Barrett, Gregory Crucian, Sarah Kortenkamp, and Kenneth Heilman 2002 Emotional experience and perception in the absence of facial feedback. *Journal of the International Neuropsychological Society* 8(1): 130–135.
- Kuklik, Miloslav 2000 Poland-Mobius Syndrome and disruption spectrum affecting the face and extremities: a review paper and presentation of five cases. *Acta Chirurgiae Plasticae* 42(3): 95–103.
- Levenson, Robert and Paul Ekman 2011 Emotional experience of individuals with Moebius Syndrome. Manuscript in preparation.
- Macgregor, Frances Cooke 1990 Facial disfigurement: Problems and management of social interaction and implications for mental health. *Aesthetic Plastic Surgery* 14(1): 249–257.
- Merleau-Ponty, Maurice 1964 *The Primacy of Perception*. Evanston, IL: Northwestern University Press.
- Meyerson, Marion and David R. Foushee 1978 Speech, language and hearing in Moebius Syndrome: a study of 22 patients. *Developmental Medicine and Child Neurology* 20(3): 357–365.
- Meyerson, Marion 2001 Resiliency and success in adults with Moebius Syndrome. *Cleft Palate – Craniofacial Journal* 38(3): 231–235.
- Möbius, Paul Julius 1888 Über angeborene doppelseitige Abducens-Facialis-Lähmung. *Münchener medizinische Wochenschrift* 35: 91–94.
- Neely, J. Gail and Peggy S. Neufeld 1996 Defining functional limitation, disability, and societal limitations in patients with facial paresis: initial pilot questionnaire. *Otology and Neurotology* 17(2): 340–342.
- Neidenthal, Paul M., Markus Brauer, Jamin B. Halberstadt and Åse H. Innes-Ker 2001 When did her smile drop? Facial mimicry and the influences of emotional state on the detection of change in emotional expression. *Cognition and Emotion* 15(6): 853–864.
- Noller, Patricia 1985 Video primacy – A further look. *Journal of Nonverbal Behavior* 9(1): 28–47.
- Oberman, Lindsay and Vilayanur Ramachandran 2007 The simulating social mind: The role of the mirror neuron system and simulation in the social and communicative deficits of autism spectrum disorders. *Psychological Bulletin*: 310–327.
- Peitersen, Erik 1992 Natural history of Bell's palsy. *Acta Oto-Laryngologica* 112(S492): 122–124.

- Pennebaker, James, Roger J. Booth and Martha E. Francis 2007 *LIWC2007 Operator's Manual*. Austin, TX: LIWC.net.
- Rumsey, Nichola, Alex Clarke, Paul White, Menna Wyn-Williams and Wendy Garlick 2004 Altered body image: appearance-related concerns of people with visible disfigurement. *Journal of Advanced Nursing* 48(5): 443–453.
- Strack, Fritz, Leonard L. Martin and Sabine Stepper 1988 Inhibiting and facilitating conditions of the human smile: A nonobtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology* 54(5): 768–777.
- Sjögreen, Lotta, Jan Andersson-Norinder, and Catharina Jacobsson 2001 Development of speech, feeding, eating, and facial expression in Mobius sequence. *International Journal of Pediatric Otorhinolaryngology* 60(3): 197–204.
- Tickle-Degnen, Linda and Kathleen Doyle Lyons 2004 Practitioners' impressions of patients with Parkinson's disease: The social ecology of the expressive mask. *Social Science and Medicine* 58(3): 603–614.
- Tickle-Degnen, Linda 2006 Nonverbal behavior and its functions in the ecosystem of rapport. In: Valerie Manusov and Miles Patterson (ed.), *The SAGE Handbook of Nonverbal Communication*. Thousand Oaks, CA: Sage.
- Tomkins, Silvan S. 1962 *Affect Imagery Consciousness*, Volume 1: The positive affects. Oxford, UK: Springer.
- Tomkins, Silvan S. 1963 *Affect Imagery Consciousness*, Volume 2: The negative affects. New York: Tavistock/Routledge.
- Twelves, Dominique, Kate S.M. Perkins and Carl Counsell 2003 Systematic review of incidence studies of Parkinson's disease. *Movement Disorders* 18(1): 19–31.
- VanSwearingen, Jessie M. and Jennifer S. Brach 1996 The Facial Disability Index: reliability and validity of a disability assessment instrument for disorders of the facial neuromuscular system. *Physical Therapy* 76(12): 1288–1298.
- VanSwearingen, Jessie M., Jeffrey F. Cohn and Anu Bajaj-Luthra 1999 Specific impairment of smiling increases the severity of depressive symptoms in patients with facial neuromuscular disorders. *Aesthetic Plastic Surgery* 23(6): 416–423.
- VanSwearingen, Jessie M., Jeffrey F. Cohn, Joanne Turnbull, Todd Mrzai, and Peter Johnson 1998 Psychological distress: linking impairment with disability in facial neuromotor disorders. *Otolaryngology-Head and Neck Surgery* 118(6): 790–796.
- Verzijl, Harriëtte T. F. M., Bert van der Zwaag, Johannes R.M. Cruysberg and George W. Padberg 2003 Möebius Syndrome redefined. *Neurology* 61(3): 327–333.

Verzijl, Harriëtte T. F. M., George W. Padberg and Machiel J. Zwarts 2005 The spectrum of Mobius Syndrome: an electrophysiological study. *Brain* 128(7): 1728–1736.

Yang, Lawrence H., Arthur Kleinman, Bruce G. Link, Jo C. Phelan, Sing Lee and Byron Good 2007 Culture and stigma: adding moral experience to stigma theory. *Social Science and Medicine* 64(7): 1524–1535.

Zigmond, Anthony S. and R. Philip Snaith 1983 The Hospital Anxiety and Depression Scale. *Acta Paediatrica Scandinavica* 67(6): 361–370.