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(Un)veiling Distinct Feelings: a Typology of Affective Reactions While Meeting People With Facial Disfigurement for the First Time

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Data availability statement

All data and materials have been made publicly available via the Open Science Framework and can be accessed at:

https://osf.io/ercp3/?view_only=a8ea943260614a9b916a4e835dadb8bc.

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Abstract

This research aims to better understand the affective dimension in the public stigma of people with Facial Difference (FD) by identifying the perceivers' various affective reactions to FD and by grouping them in a relevant typology. In a first qualitative step ($N = 47$), a vignette study based on a self-presentation paradigm was used to get participants to generate a comprehensive list of the affective states they may feel when they first meet people with FD. In a second quantitative step ($N = 385$), a questionnaire composed of the formerly generated affective states was proposed to other participants so as to statistically select the most relevant dimensions. A comprehensive list of 65 partially overlapping affective states - including 72 that have emerged in the first study and two others coming from previous research - were clustered in six factors via an exploratory factor analysis in the second study. The factors were named: "sympathy-related", "anxiety- and embarrassment-related", "surprise-related", "hostility-related", "neutrality-related", and "disgust-related". This six-factor structure was confirmed in a typology reduced to 18 affective states via a confirmatory factor analysis. This research offers a concise and complete panel of the ambivalent affective reactions to FD.

Keywords: facial difference; affective states; self-presentation paradigm; social stigma.

Introduction

In 2018, a cancer survivor was being told by the owner of a store that 'if he was going to eat in here he would have to cover his face', apparently in order to prevent the customers to run off (O'Kane, 2018). As this man's daughter created a page for donations, telling her father's experience of discrimination, she raised more than $80,000 from more than 2700 people (GoFundMe). As illustrated here, facial difference (FD) elicits ambivalence, ranging from discriminatory to supporting reactions according to the context. This paper thus aims to provide an overview of the stigmatizing and/or supporting affective reactions to this disabling - yet understudied - condition through the perceivers' perspective (Yaron et al., 2018).

Faces influence social cognition in multiple ways (for a review, see Hugenberg & Wilson, 2013). Despite the key role faces play in social and nonverbal communication, few studies have investigated the impact of a visible FD. Yet, research based on testimonies of people living with a FD show that they endure prejudices and discriminations, ranging from a lack in social acceptance to harassment and bullying (for reviews see Thompson & Kent, 2001; Wali & Regmi, 2017). Generally speaking, they must confront public stigma, through the perceivers' cognitive (e.g., stereotypes), behavioral (e.g. glances) and affective reactions (e.g., aversion; for reviews see Macgregor, 1990; Rumsey & Harcourt, 2004).

As regards this last dimension, Partridge (1998) has described the SCARED syndrome on the basis of his own experience as a person with a FD and of multiple testimonies from charity Changing Faces beneficiaries. This syndrome would consist of the affective states (SCARED meaning 'Sorry or Shocked, Curious or Confused,

Anxious, Repelled, Embarrassed, Distressed') which seem to be experienced by the perceiver of people with FD when the communication goes wrong between two individuals, one of whom has a FD. Yet, if the experience of people with FD, as reported by Partridge, provides a strong support to understand affective issues related to FD self-stigma (i.e., the social and psychological impact on the stigmatized person), empirical studies on public stigma (i.e., the social and psychological reactions of perceivers to stigma) remain rather scarce. This research focuses specifically on affective reactions elicited by people with FD as described by the perceivers themselves.

Most researchers have investigated the arousal of one specific - in most cases of a negative valence - emotion or affective state triggered by FD (e.g., disgust, fear; Blascovich et al., 2001; Shanmugarajah et al., 2012). Yet, reactions toward stigmatized individuals are often an ambivalent mixture of negative and positive feelings (Bos et al., 2013; Dovidio et al., 2000; Pryor et al., 2004). For example, an automatic feeling of disgust elicited by a hypothesized contact with an individual living with HIV might be counterbalanced by a controlled and thoughtful reaction of pity (Pryor et al., 2004). This ambivalence was found to also characterize reactions towards people with FD (Macgregor, 1990).

By adopting a more comprehensive approach, Stone and Potton (2014) asked their participants to report their subjective experience when confronting either faces pretested as being attractive, unattractive or faces with disfigurement. Their scales included 21 emotions selected from the emotions literature that were not restricted to negative affective reactions. These emotions comprised negative ones (i.e., anger, fear, disgust, anxiety, embarrassment, repulsion), but also positive ones (i.e., happiness, joy, relaxation, attraction, comfort, calm, pleasure, confidence, delight), emotions related to

sorrow (i.e., sorrow, sadness, distress) and to curiosity (i.e., curiosity, surprise, non-indifference). Participants reported higher levels of sorrow, and curiosity emotions but also lower levels of positive emotions such as joy or delight when looking at a face with FD (for a replication of difference on emotions, see also Stone & Potton, 2019). They also showed that people with FD elicit higher levels of negative emotions, but only when they experimentally lowered social desirability biases (i.e., condition of high anonymity). However, social desirability may have hindered the identification of other affective states. For instance, people with FD are targets of antisocial behaviors (e.g., hate crime, harassment; Changing Faces, 2020), which could be related to emotions having social distancing functions, like anger but also hate or contempt (see Fischer & Manstead, 2016). Yet, these affective reactions remain underexplored. On the other hand, some affective states seem redundant (e.g., repulsion, disgust) and the concomitant presentation of these affective states might lead to a focus on certain feelings to the detriment of others.

In order to follow-on the work and findings initiated by Stone and Potton (2014), the present research aimed at generating a complete set of emotional responses to an individual with FD, and to classify them into a smaller number of factors. To this end, it was decided to complement the deductive approach previously used by researchers with an inductive approach. In other words, it was investigated whether putting individuals in a specific context, specifically associated with people with FD on the one hand, and allowing people to express themselves spontaneously and without any restraints hampered by social desirability on the other hand, would lead to identify more clearly the variety of potential affective states actually felt by people encountering a person with FD.

In sum, the objective of this paper is to identify the diversity of affective states spontaneously experienced by people meeting a person with FD (Study 1) and use it as a basis to propose a typology of these affective states (Study 2), which could in the end constitute either an empirical tool for future empirical research on this issue, or an indicator for evaluation purpose (e.g., for psychosocial interventions targeting stigma prevention).

Study 1

The aim of this study was to set out a more exhaustive list of all potential affective states, including negative ones, spontaneously experienced by people meeting a person with FD. To this end, we opted for a qualitative approach. A vignette study, describing a situation in which someone comes face to face with a person with a FD on a bus, was submitted to the participants including various instructions. Indeed, in order to ease both desirable and undesirable responses, a self-presentation paradigm was used (i.e., a paradigm with varying instructions to present oneself in a good vs. bad light; Gilibert & Cambon, 2004; Jellison & Green, 1981). This study has two main advantages in the collection of all potential affective states experienced while encountering a person with FD. Firstly, negative / positive incentive conditions were specifically used to ease the expression of socially undesirable / desirable affective states. Secondly, no pre-established emotions list was submitted to the participants. These two protocol features were intended to foster the production of new affective states in comparison with earlier empirical studies on this issue.

Method

Participants

Participants were 47 graduate students in psychology who volunteered to participate to the study prior to their course without any financial counterpart (mean age = 22.45 years; $SD = 2.54$; Females = 45). These students' profile, i.e., enrolled in a master's program in psychology, was selected because of their assumed basic knowledge of the emotions lexical field. We assumed that it would be easier for them to identify their affective reactions. Since FD stigma was not expected to be related to socio-demographic characteristics, we supposed that the findings obtained from this sample could be generalized to the rest of the population (see Goode et al., 2008 cited by Stone, 2021; Stone & Potton, 2019).

Procedure and Material

After having been provided with an informed consent, participants were asked to read a vignette study (describing an imaginary situation in which they would notice a disfigurement on the face of the nearby sitting person on a bus) and then to list all the affective states they may feel in that situation. No images were presented so that the participants could not focus on affected states elicited by one type of disfigurement and to circumvent biases related to characteristics of the face observed (e.g., gender, age, ethnicity; see Zebrowitz, 2017). Based on a self-presentation paradigm (Jellison & Green, 1981), participants were asked to write three times all the affective states they could feel in the situation they had previously read. The first time (standard condition), they just had to write what spontaneously came to their mind. The second and third times (positive vs. negative incentive conditions), they were asked to report the affective states as if they were attempting to make a good vs. bad impression when

answering the question (the order of positive and negative incentive conditions was counterbalanced among the participants). The assignment was collective but participants were asked not to interact with each other. After providing socio-demographic information, participants were fully debriefed and thanked.

Results

First, the data base was cleaned and standardized. More specifically, we changed the grammatical class and replaced the past participle by the noun (e.g., 'surprised' replaced by 'surprise'). As participants were asked to answer with a single word, we replaced the nominal sentences by words referring to an affective state (e.g., 'shame of the way I gaze' by 'shame') in a few cases.

Afterwards, a lexical analysis was conducted (IRaMuTeQ program; Ratinaud, 2014). The classic lexicographical analysis revealed 537 occurrences resulting in 86 different words. A Factorial Correspondence Analysis (FCA) was conducted in order to investigate the lexical relationships between the three modalities of our "instruction" variable regarding words production. We obtained the number of occurrences for each word depending on the condition (see Table 1). The lexical extension was determined by type-token ratio (TTR) as a percentage ratio between the vocabulary size (V) and the size of the corpus (N), indicating the lexical richness of the textual repertoire. The computed value for the analyzed texts were 17.67% for the standard incentive data, 27.01 and 26.19, respectively for the positive and negative ones. These results suggest a higher lexical richness in the two last conditions.

Table 1. *Summary of the occurrences (number and total percentage) for each word produced depending on the instruction condition in Study 1.*

Occurrences	Standard	Positive incentive	Negative incentive	Total	
English translation (*original French word*)				Number	Percentage
Disgust (*Dégout*)	9	0	43	52	9.68%
Surprise (*Surprise*)	35	7	9	51	9.50%
Fear (*Peur*)	21	0	26	47	8.75%
Compassion (*Compassion*)	23	20	1	44	8.19%
Empathy (*Empathie*)	20	24	0	44	8.19%
Sadness (*Tristesse*)	14	7	2	23	4.28%
Pity (*Pitié*)	10	1	8	19	3.54%
Discomfort (*Gêne*)	10	1	7	18	3.35%
Astonishment (*Etonnement*)	18	0	0	18	3.35%
Disregard (*Indifférence*)	6	7	1	14	2.61%
Sympathy (*Sympathie*)	4	8	1	13	2.42%
Curiosity (*Curiosité*)	11	1	0	12	2.23%
Benevolence (*Bienveillance*)	1	10	0	11	2.05%
Uneasiness (*Malaise*)	4	0	5	9	1.68%
Joy (*Joie*)	0	8	1	9	1.68%
Neutrality (*Neutralité*)	1	7	0	8	1.49%
Fright (*Effroi*)	2	0	5	7	1.30%
Sorrow (*Peine*)	5	1	0	6	1.12%
Interest (*Intérêt*)	4	2	0	6	1.12%
Shame (*Honte*)	1	0	5	6	1.12%
Shock (*Choc*)	3	0	3	6	1.12%
Rejection (*Rejet*)	0	0	6	6	1.12%
Mockery (*Moquerie*)	0	0	6	6	1.12%
Contempt (*Mépris*)	0	0	5	5	0.93%
Understanding (*Compréhension*)	0	5	0	5	0.93%
Stupor (*Stupeur*)	2	0	1	3	0.56%
Horror (*Horreur*)	0	0	3	3	0.56%
Intrigue (*Intrigue*)	3	0	0	3	0.56%
Guilt (*Culpabilité*)	3	0	0	3	0.56%
Aggressiveness (*Agressivité*)	0	0	3	3	0.56%
Questioning (*Questionnement*)	2	0	0	2	0.37%
Query (*Interrogation*)	2	0	0	2	0.37%
Acceptance (*Acceptation*)	1	1	0	2	0.37%
Trouble (*Confusion*)	1	0	1	2	0.37%
Strangeness (*Étrangeté*)	2	0	0	2	0.37%
Kickback (*Recul*)	0	0	2	2	0.37%
Startle (*Sursaut*)	2	0	0	2	0.37%
Grief (*Chagrin*)	1	1	0	2	0.37%
Apprehension (*Crainte*)	1	0	1	2	0.37%
Anger (*Colère*)	0	0	2	2	0.37%
Security (*Sécurité*)	0	1	0	1	0.19%
Nausea (*Écœurement*)	0	0	1	1	0.19%
Tolerance (*Tolérance*)	0	1	0	1	0.19%
Indignation (*Indignation*)	0	0	1	1	0.19%
Envy (*Envie*)	0	1	0	1	0.19%

Ease (*Aisance*)	0	1	0	1	0.19%
Intimidation (*Intimidation*)	1	0	0	1	0.19%
Warmth (*Chaleur*)	0	1	0	1	0.19%
Comfort (*Réconfort*)	0	1	0	1	0.19%
Uncertainty (*Insécurité*)	0	0	1	1	0.19%
Fun (*Amusement*)	0	0	1	1	0.19%
Injustice (*Injustice*)	0	1	0	1	0.19%
Disconsideration (*Déconsidération*)	1	0	0	1	0.19%
Coldness (*Froideur*)	0	0	1	1	0.19%
Ignorance (*Ignorance*)	0	0	1	1	0.19%
Altruism (*Altruisme*)	0	1	0	1	0.19%
Distancing (*Eloignement*)	0	0	1	1	0.19%
Disdain (*Dédain*)	0	0	1	1	0.19%
Malice (*Méchanceté*)	0	0	1	1	0.19%
Satisfaction (*Satisfaction*)	0	0	1	1	0.19%
Respect (*Respect*)	0	1	0	1	0.19%
Consideration (*Égard*)	0	1	0	1	0.19%
Distress (*Bouleversement*)	1	0	0	1	0.19%
Solidarity (*Solidarité*)	0	1	0	1	0.19%
Tenderness (*Tendresse*)	0	1	0	1	0.19%
Anxiety (*Angoisse*)	1	0	0	1	0.19%
Concern (*Préoccupation*)	1	0	0	1	0.19%
Affection (*Affection*)	0	1	0	1	0.19%
Condescension (*Condescendance*)	0	0	1	1	0.19%
Obsession (*Obnubilation*)	0	0	1	1	0.19%
Calm (*Calme*)	0	1	0	1	0.19%
Hate (*Haine*)	0	0	1	1	0.19%
Smile (*Sourire*)*	1	4	0	5	0.93%
Laughter (*Rire*)*	1	1	1	3	0.56%
Welcoming ('*Accueillance*')*	1	2	0	3	0.56%
Nothing (*Rien*)*	0	3	0	3	0.56%
Flight (*Fuite*)*	0	0	2	2	0.37%
Violence (*Violence*)*	0	0	1	1	0.19%
Avoidance (*Evitement*)*	0	0	1	1	0.19%
Help (*Aide*)*	1	0	0	1	0.19%
Sociability (*Sociabilité*)*	0	1	0	1	0.19%
Funny (*Drôle*)*	0	1	0	1	0.19%
Judgment (*Jugement*)*	0	0	1	1	0.19%
Intrusiveness (*Indiscrétion*)*	0	0	1	1	0.19%
Dreaming (*Songe*)*	1	0	0	1	0.19%
Arrogance (*Hautain*)*	0	0	1	1	0.19%
N	232	137	168	137	
V	41	37	44	86	
TTR (%)	17.67	27.01	26.19		

Note. Occurrences' percentage are sorted by size. * signal words removed after expert agreement. A

FCA also allows a Cartesian graphical visualization of the proximities, oppositions and tendencies of the words. This analysis mostly indicated clear divide across the conditions (see Figure 1).
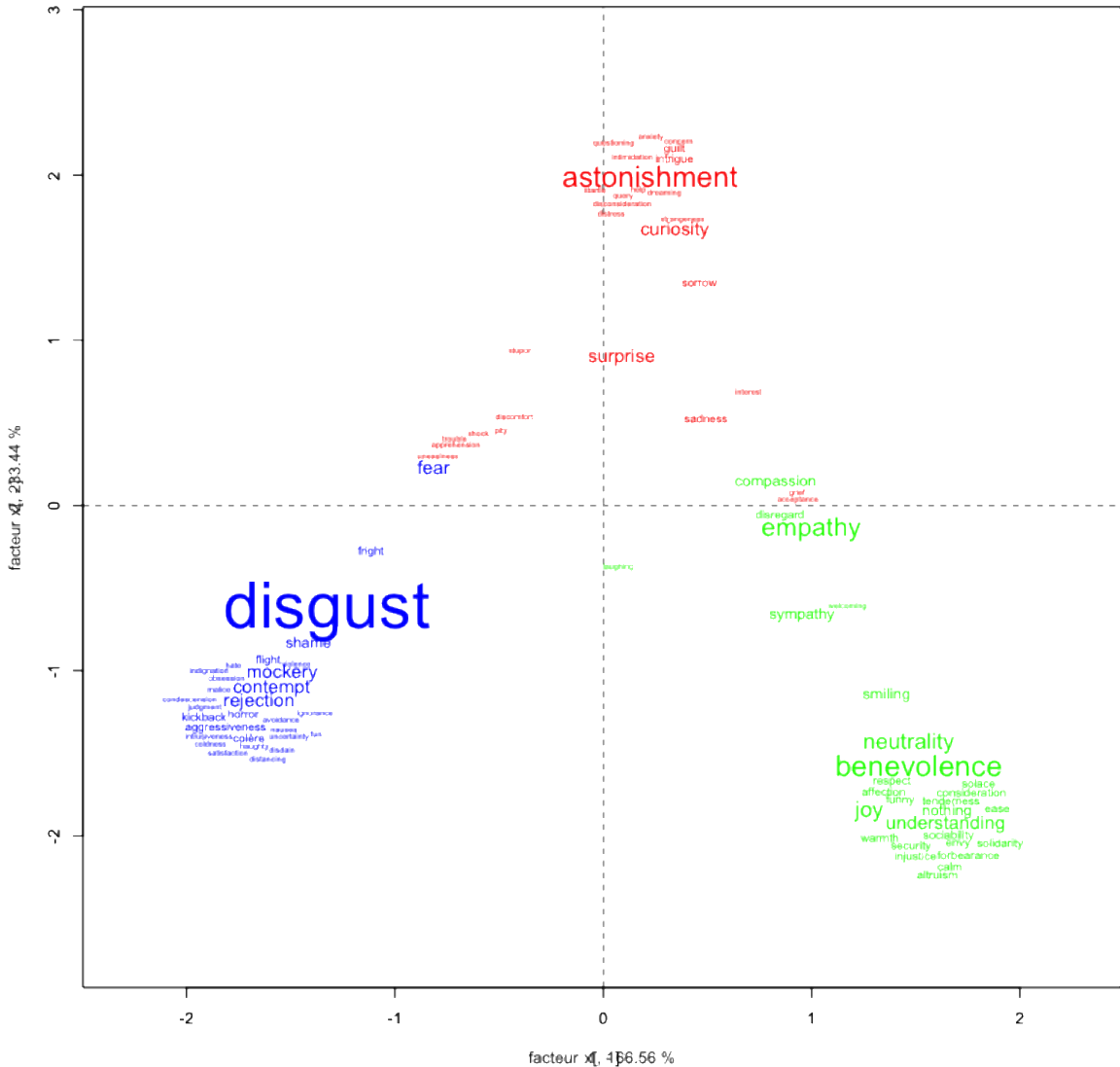

Figure 1. *Relationships between conditions and words in Study 1. Red-condition standard; green-condition positive incentive; blue-condition negative incentive. NB: text size is proportional to χ2, overlaps are avoided. See the online article for a colored version of the figure.*

As each of the 86 words were not all related to affective states, we decided to separately evaluate them in order to state whether they could be considered as affective states or

not. As the intercoder agreement was moderate (Cohen's κ = .43), we decided to remove all words that were identified as not revealing any affective state by at least one expert. Hence, the remaining list consisted of 72 words including 31 appearing only once (see Table 1). Among these 72 words, only 36 were elicited in the standard condition. Considering the 36 remaining words that have emerged from the incentive conditions, 15 were elicited only in the positive incentive condition (e.g., 'understanding', 'nothing'), 20 only in the negative incentive condition (e.g., 'rejection', 'mockery') and one in both conditions (e.g., 'joy').

Discussion

All of these results highlight the benefit of a self-presentation paradigm to produce a real variety of affective states elicited by people with FD. The CFA showed that the incentives eased the production of distinct and even sometimes opposed words. Although we did not use visual stimuli, the affective states previously highlighted in the literature were again elicited in this study, supporting the applicability of the results (e.g., fear, disgust, curiosity, surprise; see Stone & Potton, 2014). Moreover, a high proportion of words (20 out of 72) have emerged from the negative incentive condition. As expected, the strategy facilitated the expression of socially undesirable affective states and the discrimination among negatively valanced affective states (e.g., disdain, fright, aggressiveness).

The remaining list consisted of 72 affective states spontaneously produced by the participants as they imagined themselves confronting a person with FD in an everyday situation. Nevertheless, it was unusable as such for future empirical studies because it was too long and some affective states were overlapping. In addition, because some of them were related to the same affective state, the list was redundant. Our

approach, after benefiting from a qualitative perspective, had now reached a stage

requiring a quantitative approach in order to group the 72 identified affective states into

affective factors.

Study 2

Building on the 72 affective states formerly identified in Study 1, the aim of this second

study was to propose an empirical tool to measure affective states elicited by people

with FD in future empirical research. For this purpose, we opted for a quantitative

approach. In the same manner as in Study 1, a vignette study describing a situation in

which someone comes face to face with a person with a FD on a bus, was submitted to

all participants who were asked to what extent they would experience each one of the

listed affective states in the described situation. The set of affective states was

composed of the affective states identified in Study 1. We opted for a self-presentation

paradigm in Study 1 in order to ease the spontaneous production of negatively-valenced

affective states, whereas Study 2 only required the standard condition. Indeed, as the

aim here was to identify affective states overlapping or correlating in a same single

factor, no variation in instruction was considered useful for this purpose.

Method

Participants

Three hundred eighty-five undergraduate students from different backgrounds

volunteered to participate to the study prior to their course without any financial

counterpart (mean age = 19.20 years; SD = 1.82; Females = 262). The sample size was

computed based on a minimal subject to item ratio at 5:1 (Costello & Osborne, 2005).

The data of four participants signaling a personal disfigurement were withdrawn from

the study as well as three incomplete questionnaires. On the whole, participants mostly

imagined mild to severe disfigurement[1].

Procedure and Material

Participants provided an informed consent. After that, they were asked to read the same

vignette as in Study 1. They were then asked to fill in a paper-and-pencil questionnaire

composed of the 72 previously generated affective states listed in fixed order (i.e., in

alphabetical order). The assignment was collective but participants were asked not to

interact with each other. Since previous research evidenced that 'embarrassment' and

'repulsion' are invoked by the perception of people with FD (Stone & Potton, 2014,

2019; see also Macgregor, 1990; Rumsey & Harcourt, 2004), these words were added to

the list. Participants were asked to rate the extent to which they might feel each of the

proposed 74 affective states in the situation described in the vignette on a scale ranging

from 1 ('does not fit at all') to 7 ('fits totally'). After providing socio-demographic

information, participants were fully debriefed and thanked.

Results

In a first step, to assess the underlying factor structure of the collected items, we

conducted an exploratory factor analysis (EFA) with the 74 items. The Kaiser-Meyer-

Olkin measure (KMO) of sampling adequacy for the EFA was .89, which suggested that

the data was adequate to run the EFA. Moreover, a significant Bartlett's Test of

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[1] Severity was assessed based on the drawings and comments provided by participants ($N = 311$, 74 participants did not report any drawing or comment) in the debriefing section of the questionnaire by four independent judges with an adapted version of the Observer-rated disfigurement scale (Katz et al., 2000). We computed inter-rater agreement using intraclass correlations (ICC; Koo & Li, 2016). ICC estimate was calculated using Jamovi and "seolmatrix" statistical package (The Jamovi project, 2021) based on a mean-rating ($k = 4$), consistency, 2-way mixed-effects model. We obtained an ICC = .63 which indicates moderate reliability. A mean score of severity was then computed for each participant by averaging the scores attributed by raters. To conclude, this exploratory analysis shows that participants mostly imagined mild to severe disfigurements ($M = 6.70$, $SD = 1.50$).

Sphericity indicated that the data were suitable, $\chi^2(2701) = 12521$, $p < .001$. Since

Skewness tests revealed a lack of multivariate normality for a minority of items (16/74;

see Table 2), we tested the factor structure of the questionnaire with an EFA and the

maximum likelihood extraction method (Costello & Osborne, 2005). As regards factor

extraction, we investigated the values of the Kaisers' criterion, the scree plots, as well as

the results of parallel analyses. As we aimed at developing a compound measure of

affective states toward people with FD, we applied Oblimin factor rotation, which

allows the factors to correlate with each other.

According to Kaiser's criterion and to the scree-plot, the EFA resulted in five factors.

The parallel-analysis pointed to six factors. As the cumulative percentage of variance

was low for five factors (38.89%) and because the highest item among the sixth factor's

loading was the emotion of disgust – which is known to be a particularly relevant

affective state when interacting with people with FD (e.g., Ryan et al., 2012;

Shanmugarajah et al., 2012) and which was the most cited word in the first study - we

decided to keep the six-factor structure, accounting for 44.81% of the variance. We

named those factors after the main affective state associated to them: 'sympathy-

related', 'anxiety- and embarrassment related', 'surprise-related', 'hostility-related',

'neutrality-related', and 'disgust-related' (see Table 2 for a summary of the EFA).

Table 2. *Summary of Exploratory Factor Analysis results using Maximum Likelihood*

Factoring and Oblimin Rotation in Study 2.

Occurrences (*French*)	Skewness (SE)	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Solidarity (*Solidarité*)	-0.47 (0.13)	**0.78**	-0.09	-0.01	0.04	-0.03	0.08
Benevolence (*Bienveillance*)	-0.80 (0.12)	**0.73**	-0.08	0.09	-0.09	0.02	-0.02
Sympathy (*Sympathie*)	-0.56 (0.12)	**0.72**	0.07	-0.05	0.02	0.07	-0.18
Tenderness (*Tendresse*)	0.25 (0.12)	**0.67**	0.09	-0.06	0.16	0.00	-0.16
Altruism (*Altruisme*)	-0.58 (0.13)	**0.66**	0.00	0.00	-0.10	0.12	0,00
Compassion (*Compassion*)	-1.07 (0.12)	**0.65**	-0.03	0.09	-0.16	-0.22	0.02
Respect (*Respect*)	-1.02 (0.12)	**0.65**	0.07	-0.06	-0.03	0.25	0.02
Empathy (*Empathie*)	-0.89 (0.12)	**0.63**	-0.03	0.14	-0.14	-0.17	-0.02
Tolerance (*Tolérance*)	-1.35 (0.12)	**0.62**	-0.11	0.18	-0.17	0.21	0.04
Understanding (*Compréhension*)	-0.81 (0.13)	**0.60**	-0.01	-0.02	-0.11	0.09	-0.05
Affection (*Affection*)	-0.12 (0.12)	**0.60**	-0.08	-0.07	0.05	-0.11	-0.03
Sorrow (*Peine*)	-0.41 (0.12)	**0.58**	0.11	0.16	-0.02	**-0.32**	0.07
Injustice (*Injustice*)	0.38 (0.12)	**0.45**	0.17	0.05	0.29	-0.15	0.03
Sadness (*Tristesse*)	-0.06 (0.12)	**0.45**	0.20	0.10	0.09	**-0.40**	-0.04
Grief (*Chagrin*)	0.18 (0.13)	**0.44**	0.14	0.06	0.13	**-0.43**	-0.06
Acceptance (*Acceptation*)	-0.88 (0.12)	**0.34**	-0.16	-0.01	-0.18	0.16	-0.2
Comfort (*Réconfort*)	0.97 (0.13)	**0.34**	0.14	0.09	0.20	0.07	-0.25
Pity (*Pitié*)	-0.02 (0.12)	0.30	0.15	0.26	-0.04	-0.23	0.16
Condescension (*Condescendance*)	1.31 (0.13)	0.12	0.03	0.03	0.11	0.01	0.06
Apprehension (*Crainte*)	1.12 (0.12)	0.03	**0.76**	0.01	0.06	0.03	0.01
Fear (*Peur*)	1.35 (0.12)	0.04	**0.73**	-0.04	-0.11	0.03	0.24
Anxiety (*Angoisse*)	0.63 (0.12)	-0.10	**0.66**	0.09	0.03	-0.13	-0.08
Uncertainty (*Insécurité*)	0.10 (0.13)	0.01	**0.65**	-0.08	0.08	0.06	0.14
Fright (*Effroi*)	1.26 (0.12)	0.05	**0.58**	0.00	0.00	-0.05	0.21
Distancing (*Eloignement*)	1.11 (0.12)	-0.04	**0.57**	0.06	-0.07	0.07	**0.35**
Embarrassment (*Embarras*)	0.19 (0.12)	-0.04	**0.51**	0.24	-0.07	-0.16	0.15
Intimidation (*Intimidation*)	-0.70 (0.12)	0.11	**0.45**	0.19	0.08	-0.05	0.01
Guilt (*Culpabilité*)	0.90 (0.12)	0.21	**0.45**	0.09	0.17	-0.17	-0.23
Discomfort (*Gêne*)	0.04 (0.12)	-0.09	**0.41**	0.29	-0.02	-0.15	0.13
Uneasiness (*Malaise*)	0.05 (0.12)	-0.14	**0.40**	**0.33**	0.03	-0.25	0.07
Backsliding (*Recul*)	0.70 (0.13)	0.17	**0.37**	0.00	-0.04	0.27	0.26
Trouble (*Confusion*)	0.18 (0.12)	-0.06	**0.36**	**0.32**	-0.04	-0.15	-0.04
Startle (*Sursaut*)	0.79 (0.12)	-0.01	**0.34**	0.28	-0.01	-0.10	0.14
Intrigue (*Intrigue*)	-0.57 (0.13)	0.07	-0.17	**0.81**	0.00	0.10	0.11
Enquiry (*Interrogation*)	0.26 (0.13)	0.05	0.00	**0.80**	-0.05	0.01	-0.02
Questioning (*Questionnement*)	-0.65 (0.12)	0.08	-0.06	**0.72**	-0.06	0.01	0.01
Astonishment (*Etonnement*)	-0.38 (0.12)	-0.08	0.22	**0.57**	-0.08	-0.07	-0.04

		1	2	3	4	5	6
Surprise (*Surprise*)	-0.40 (0.13)	-0.05	0.20	**0.55**	-0.02	-0.08	-0.02
Curiosity (*Curiosité*)	-0.37 (0.12)	-0.09	-0.01	**0.55**	-0.02	0.11	-0.14
Strangeness (*Etrangeté*)	0.21 (0.12)	-0.15	0.24	**0.45**	0.05	0.03	0.24
Obsession (*Obnubilation*)	0.99 (0.13)	0.03	0.11	**0.43**	0.14	0.04	0.06
Interest (*Intérêt*)	1.75 (0.12)	**0.30**	-0.06	**0.40**	0.27	0.06	-0.16
Concern (*Préoccupation*)	0.16 (0.12)	0.23	0.17	**0.38**	0.15	-0.21	-0.05
Stupor (*Stupeur*)	0.38 (0.13)	0.05	0.22	**0.36**	0.05	-0.14	0.15
Consideration (*Egard*)	0.64 (0.13)	0.13	0.20	0.21	0.00	-0.09	0.11
Malice (*Méchanceté*)	4.31 (0.12)	-0.17	-0.07	-0.04	**0.76**	-0.05	0.06
Hate (*Haine*)	4.28 (0.12)	0.06	0.00	-0.10	**0.71**	-0.02	0.16
Contempt (*Mépris*)	3.43 (0.12)	-0.10	-0.06	0.02	**0.67**	0.08	0.21
Anger (*Colère*)	2.86 (0.12)	0.08	-0.02	-0.03	**0.60**	-0.16	0.02
Aggressiveness (*Agressivité*)	3.24 (0.12)	-0.05	0.04	-0.04	**0.54**	-0.01	0.22
Satisfaction (*Satisfaction*)	2.99 (0.12)	0.13	0.04	-0.03	**0.50**	**0.33**	0.01
Indignation (*Indignation*)	2.13 (0.13)	0.16	0.14	-0.04	**0.47**	-0.05	0.07
Mockery (*Moquerie*)	3.66 (0.13)	-0.28	-0.15	0.23	**0.43**	0.07	0.13
Fun (*Amusement*)	2.79 (0.12)	-0.19	0.01	0.08	**0.36**	0.25	0.00
Coldness (*Froideur*)	1.43 (0.12)	-0.18	**0.3**	0.10	**0.34**	0.20	0.19
Shame (*Honte*)	2.72 (0.12)	-0.15	**0.33**	0.20	**0.33**	-0.05	-0.11
Warmth (*Chaleur*)	0.87 (0.13)	0.27	0.19	0.06	0.27	-0.03	-0.21
Disconsideration (*Déconsidération*)	1.81 (0.13)	-0.10	0.13	0.13	0.22	0.21	0.17
Disregard (*Indifférence*)	0.65 (0.12)	-0.24	0.09	0.08	0.03	**0.53**	-0.14
Joy (*Joie*)	2.83 (0.12)	0.14	0.12	0.10	0.28	**0.50**	-0.13
Neutrality (*Neutralité*)	0.02 (0.13)	-0.03	-0.06	0.03	-0.09	**0.48**	-0.02
Calm (*Calme*)	-0.64 (0.12)	0.14	-0.15	0.01	-0.11	**0.45**	-0.11
Ease (*Aisance*)	0.20 (0.13)	0.21	-0.15	-0.13	-0.12	**0.45**	-0.10
Ignorance (*Ignorance*)	0.74 (0.12)	-0.24	0.29	0.11	0.01	**0.34**	-0.05
Shock (*Choc*)	-0.23 (0.12)	0.00	**0.31**	**0.31**	-0.14	**-0.33**	0.05
Distress (*Bouleversement*)	-0.16 (0.12)	**0.30**	0.27	0.10	0.00	**-0.31**	0.02
Security (*Sécurité*)	0.47 (0.13)	0.28	-0.16	0.09	0.13	**0.31**	0.01
Envy (*Envie*)	2.59 (0.13)	0.27	0.06	0.09	0.27	**0.31**	-0.04
Disgust (*Dégout*)	1.56 (0.12)	-0.01	0.07	0.10	0.06	-0.02	**0.80**
Nausea (*Ecoeurement*)	1.87 (0.12)	-0.02	0.03	0.01	0.15	-0.06	**0.78**
Repulsion (*Répulsion*)	2.46 (0.13)	-0.05	0.19	0.00	0.27	-0.04	**0.56**
Rejection (*Rejet*)	2.24 (0.12)	-0.09	**0.32**	-0.02	**0.32**	0.02	**0.46**
Horror (*Horreur*)	2.21 (0.12)	0.02	**0.38**	-0.05	0.21	-0.06	**0.42**
Disdain (*Dédain*)	2.19 (0.13)	0.00	0.23	0.03	0.24	0.15	0.25
Eigenvalues		14.26	9.03	3.65	2.42	**1.37**	**0.92**
Extraction Sums of Squared Loadings Percent of Variance		10,30	9,71	7,28	6,78	**4,81**	**5,92**

Note. Factor's loadings are sorted by size. Factor loadings over .30 are written in bold. Factors: 1. Sympathy-related, 2. Anxiety- and embarrassment-related, 3. Surprise-related, 4. Hostility-related, 5. Neutrality-related, 6. Disgust-related.

In a second step, based on the exploratory factor structure evidenced, we conducted a Confirmatory Factor Analysis (CFA) to examine the model fit using Full Information Maximum Likelihood method (FIML). Considering the parsimony issue, we only submitted 18 items assessing the participant's affective states (for each factor, the three items with the highest factor's load were selected, except that we used 'calm' instead of 'joy' since the former was more congruent with the dimension called 'neutrality'). The CFA indicated acceptable fit statistics ($\chi^2(120) = 323.0$, $p < 001$, CFI = .93, TLI = .92, RMSEA range 0.06–0.07; Hu & Bentler, 1999). In addition, the factor loadings for sympathy-related (.70-.85), anxiety- and embarrassment-related (.66-.84), surprise-related (.75-.93), hostility-related (.71-.89), neutrality-related (.56-.62), and disgust-related affective states (.74-.91) were all sizeable and statistically reliable (all $p < .001$). Except for the inter-correlations between disgust-related and anxiety/embarrassment-related affective states, and between disgust-related and hostility-related affective states (respectively .61 and .63), the inter-correlations between the factors were low (.07-.37).

Discussion

The affective states that emerged from Study 1 were clustered in six factors in this second study: 'sympathy-related', 'anxiety- and embarrassment-related', 'surprise-related', 'hostility-related', 'neutrality-related', and 'disgust-related'. The first *'sympathy-related'* factor is made of affective states such as 'solidarity', 'sympathy', or 'benevolence' which express other-oriented affective states (Goetz et al., 2010). They express sorrow for the other. From this standpoint, two affective states may be missing in this dimension: pity and (social) warmth (Eisenberg, 2016; Pryor et al., 2004; Weiner et al., 1988). This may be due to linguistic changes in the meaning of affective states (e.g., 'to pity somebody' may be perceived as having a rather derogatory connotation in

the French language). The second *'anxiety- and embarrassment-related'* factor, refers simultaneously to affective states centered on threat (e.g., fear, apprehension, anxiety) and on self-conscious affective states (e.g., embarrassment, discomfort; Lewis, 2008; Öhman, 2008). Although combining these seemingly different groups of affective states may be surprising at first glance, some affective states are known to be closely related (e.g., shyness; Öhman, 2008). Moreover, fear about interpersonal interactions is one of the most commonly feared situation (Arrindell et al., 1991). Thus, anxiety could be triggered by uncertainty about how social interactions with people with FD would proceed (Hebl et al., 2000; Stone & Fisher, 2020). The third *'surprise-related'* factor, refers to affective states showing reactions towards an unexpected situation (e.g., intrigue, curiosity, strangeness). The fourth *'hostility-related'* factor, gathers affective states that facilitate active rejection (e.g., hate, anger, mockery). The fifth *'neutrality-related'* factor gathers affective states that reflect a lack of change or self-control (e.g., indifference, ease, calm). The last *'disgust-related'* factor, gathers different affective states related to disgust and aversion. Six items fell under the threshold of .30 for factor loading. This typology is thus in line with but also extends to former research. Indeed, we replicated previous work regarding the content of the affective reactions elicited by FD (for a review, see Stone & Potton, 2014). Additionally, we proposed a classification into a reduced number of factors.

Interestingly this typology distinguishes affective states related to disgust, anxiety, and hostility. Yet, disgust-related affective states were strongly correlated with anxiety-related affective states on the one hand and hostility-related affective states on the other hand, while anxiety-related and hostility-related affective states displayed much lower correlations. These correlations may be at least partly explained by the behavioral component of disgust, which distances individuals from objects (Rozin et al.,

2016). Distancing may thus imply either avoidance in embarrassment- and anxiety-related affective states, or rejection in hostility-related affective states.

General Discussion

There is a need for a better understanding of individuals' affective reactions when encountering people with FD. Although negative reactions towards FD are ubiquitous and appear early in the development of individuals (e.g., Sigelman et al., 1986), the study of emotional responsiveness has received relatively little interest (see Stone & Potton, 2014). This exploratory qualitative and quantitative study investigated the affective states felt when simulating a confrontation with an unknown person with FD, whilst taking into consideration social desirability biases. A comprehensive list of 74 affective states was proposed and 65 of these partially overlapping states were clustered in six factors and can even be reduced to 18 items. On the whole, this research mostly confirms previous work regarding the content of stigmatizing affective reactions (for a review, see Stone & Potton, 2014) but also improves them by proposing an organization of these affective reactions through a six-factors typology. A discussion on these two points and on the benefits of this organization for the study of the stigmatizing affective reactions to FD will be provided.

First, this research highlights the formerly well evidenced affective states, such as 'anxiety', 'fear', 'curiosity', 'surprise', 'embarrassment' or 'disgust' (e.g., Blascovich et al., 2001; Partridge, 1998; Shanmugarajah et al., 2012; Stone & Fisher, 2020). The mention of disfigurement is highly associated with the emotion of disgust (Ryan et al., 2012; Shanmugarajah et al., 2012). These affective states also comprise those showing the ambivalence aroused by FD, such as 'sympathy', 'compassion', 'benevolence' or 'sorrow' (Bonanno & Choi, 2010; Stone & Potton, 2014, 2019). Our

study contributed to complete this list, while evidencing antisocial affective states formerly evidenced from the perspective of people with FD only, such as 'malice', 'disdain', 'hate' (Changing Faces, 2020; Macgregor, 1990). On another note, this study also stressed the presence of 'neutrality', 'indifference', and other affective states denoting a lowered emotional arousal. Thus, this research replicated and completed previous work regarding the content of stigmatizing affective reactions.

Second, this research organized affective reactions towards people with FD in a six-factors typology, including 'sympathy-related', 'anxiety- and embarrassment-related', 'surprise-related', 'hostility-related', 'neutrality-related', and 'disgust-related' affective states. Frequently, affective states are gathered according to their valence although a valence-based approach built upon the positive and negative aspects lacks differentiation and nuances reactions (Lerner & Keltner, 2000). Exploring the affective reactions towards people with FD through the prism of valence creates the risk of missing their specific influence on the perceivers' cognitive and behavioral reactions. As FD elicited ambivalent affective states, like other social stigmas (e.g., HIV; Pryor et al., 2004), this research confirms that the investigation of affective reactions to people with FD needs to go beyond a valence scale. Yet, many of the remaining affective states are negative and the small but steady correlations between the different factors point to a broad factor of negative emotionality. Valence should therefore be questioned, but maybe more at the level of moral goodness than at the level of pleasantness (Shuman et al., 2013).

Finally, this research contributes to stress the importance to study these six groups of affective reactions in the stigmatizing reactions to FD, which paves the way for future research. Indeed, this research highlights that invoking disfigurement is highly associated with the emotion of disgust (Ryan et al., 2012; Shanmugarajah et al.,

2012). Whereas some theorists argue for evolutionary reasons that people avoid those who are supposed to carry pathogens (see Kurzban & Leary, 2001), societal, social and individual explanations might be questioned too. For example, the media may contribute to FD stigma through the isolated representation of rare disfigurement or movie villain's representations (e.g., zombies; Croley et al., 2017; Gunter, 2012; Reese, 1995). Some individual differences were evidenced too, such as the individual sensibility to disgust (Shanmugarajah et al., 2012). Interestingly, in this research, disgust-related affective states were correlated with anxiety/embarrassment-related and hostility-related affective states. Anxiety/embarrassment-related affective states stress the disruptiveness of FD in the social interactions, which may lead individuals with and without FD to put an end to it (Hebl et al., 2000; Partridge, 1998; Stone & Fisher, 2020). In a more radical fashion, hostility-related affective states imply rejection and antisocial behaviors. Although these affective reactions help to understand the antisocial behaviors people with FD endure (see Changing Faces, 2020; Macgregor, 1990), the emphasis on 'disgust', 'horror' or 'hate' raises questions: do people with FD actually engender such a terrifying perception from people and not only from highly prejudiced individuals? Yet, this study has also evidenced that neutrality-related and sympathy-related affective states contribute to a broader understanding of the affective reactions to FD. As both of these affective states were mainly evidenced thanks to the positive-incentive' condition of our first study, they probably reflect what the participants think they would like to feel in such given situations or even how they would actually feel. The least consideration of these affective states in previous research may be due to an excessive focus on problems and difficulties of social interactions with people with FD (see Rumsey & Harcourt, 2005). Yet, this pattern of affective states is not always beneficial and desired or requested by people with FD. For example, Bonanno and Choi

(2010) revealed that expressions of unnecessary sympathy in a large group may make them feel uncomfortable. In the same vein, indifference may lead to benign neglect (i.e., individuals are not subject to particular attention), which can make people with FD feel uncomfortable if they feel ignored (Bonanno & Choi, 2010). In other words, seemingly prosocial or neutral affective states may still be stigmatizing if they remind the bearer of his/her 'mark', and may thus lead to self-stigmatization (Chaudoir et al., 2013; Goffman, 1963).

Limitations and future directions

Some limitations regarding the context, the FD, the perceivers, and the affective states should be noted. First, as this study focused on a specific social situation (i.e., standing close to a stranger in a public place) and because social stigma is context-specific, we have probably not evidenced all possible affective states (Major & O'Brien, 2005). The grouping of affective states centered on threat and self-conscious affective states may have been guided by the story told on the vignette and would have not occurred if the participants had to picture themselves interacting with the person and not only sitting next to him/her. Further studies should thus try to explore some more varied situations, especially in real settings.

Second, as participants were instructed to imagine a FD rather than to simply look at it, some variations may have occurred. We preferred these settings to avoid restricting the typology to one specific visible difference since FD comprises a wide range of conditions (Krishna, 2009). These variations were not supposed to impact the structure of the typology but rather the intensity and type of affective states elicited. However, future studies should verify that this typology is applicable to all conditions that involve a visible difference.

Third, this study was conducted based on samples of French students and future studies are needed to determine whether our findings can really be generalized to other cultures. For instance, some variations in preferences toward peers with FD were found between children from different cultures (e.g., between Americans, Nepalese and Philippines' children; (Harper, 1997; Harper & Peterson, 2001). Even if FD seems to be stigmatized across times and cultures (Kurzban & Leary, 2001), the specific affective states aroused may differ depending on the culture. More generally, future research using this typology is needed to better prove its internal consistency.

Finally, we took a static picture of all possible affective states, notwithstanding their timing. Considering the dual process of reactions to stigma, it is most likely that all affective states do not arouse at the same time, at the same level (Pryor et al., 2004). On the contrary, some affective states may arise reflexively (e.g., disgust, fear) and others more deliberately (e.g., sympathy, hate). Further studies should thus examine the possible dynamic evolution of those affective states.

Implications

This research has several implications. First, it focused on affective reactions as they may be highly stigmatizing, engendering awkward moments (Hebl et al., 2000) but also supportive, engendering acceptance in relationships (Bogdan & Taylor, 1989). The wide variety of affective reactions that was evidenced could be used in clinical settings. Indeed, interventions targeting social skills were developed in order to help visibly different people to confront difficult social situations (e.g., 'Changing Faces Package'; Clarke, 1999). A better understanding of 'how' - and further research on 'why' - people react that way could thus be helpful, notably in psychosocial training programs targeting these specific affective reactions.

Second, as Bogart (2020) emphasized, social policy is a powerful way to act upon stigma. Nevertheless, as when designing any behavior change strategy, an indicator providing evidence of its effectiveness is needed. Our typology has thus been designed for that purpose, as a possible empirical tool providing indicators for evaluation purpose. Our findings also provide a basis for further empirical work investigating the determinants, correlates, and consequences of these reactions separately and of their interactions.

Third, this research provides the perceiver's perspective. Indeed, while focusing solely on the people with FD perspective, two assumptions are made: 1) stigmatizing reactions are obvious, and 2) experience of people with FD is not biased (e.g., by beliefs, former experiences). As researchers have shown that stigma reactions can be subtle (see Bos et al., 2013), and that the stigma felt might rather reflect anticipation than actual discrimination (Kleck & Strenta, 1980), evidences of perceivers' reactions are needed in order to complement people with FD's testimonies. They might even be crucial when tailoring behavior change strategies. Yet, further work is required to determine how a greater understanding of these reactions in the context of disfiguring conditions can be applied to develop prevention strategies.

Conclusion

As for disability in general, there are two ways of seeing disfigurement issues (see Bogart & Dunn, 2019). First, it can be seen as an individual issue: people living with a FD bear differences from a standard. The solution has thus to be found among these stigmatized people. Second, disfigurement can be seen as a social issue: people living with a FD live in a society, which is not sufficiently inclusive and even biased against them. Here, the solution has to be found in their environment. In line with this second

approach, this research documents affective reactions towards people with FD. Based on the perceiver's perceptions, we provide in a first step a comprehensive list of affective states that might be felt by the perceivers, and, in a second step, a typology of the most relevant ones, covering the main affective reactions. We hope this work will enable future research investigating determinants, correlates, and consequences of affective reactions to people with FD to try preventing them. Its aim was thus to contribute to a better understanding of how we can promote a more 'face positive' society, which would benefit the many rather than the few.

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