

Levels of Structural Integration and Facial Expressions of Negative Emotions¹

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Zusammenfassung

Strukturniveau nach OPD und die Referenz negativer mimischer Affekte

Fragestellung: Für das Verstehen von mimischem Affektverhalten ist es wichtig, den spezifischen Kontext des Ausdruckes mit einzubeziehen, dies gilt insbesondere für ein klinisches Verstehen. Wir gehen davon aus, dass die Differenzierung der negativen Affektausdrücke nach ihrer Referenz mit dem Strukturniveau nach OPD in Zusammenhang steht.

Methode: Das mimische Affektverhalten von 80 Frauen wurde mittels FACS (Facial Action Coding System) und MFZ (Mimik-Funktions-Zuschreibung, Bock et al. 2015) kodiert. Den 2192 negativen Affektausdrücken wurde durch das Einbeziehen der kontextuellen Information eine Referenz zugeordnet (Überkategorien: interaktiv, Selbst und Objekt).

Ergebnisse: Die reinen Häufigkeiten der Affektausdrücke zeigen keine Zusammenhänge zum Strukturniveau. Negative Affekte, welche sich gegen den Interviewer richten (Kategorie *interaktiv*) und Affekte, welche sich auf das gesamtheitliche Selbst beziehen, stehen in einem positiven Zusammenhang mit einem defizitäreren Strukturniveau nach OPD. Im Gegensatz dazu stehen negative Affekte, welche auf einen Aspekt des Selbst oder des Objekts oder auf eine situative Begebenheit Bezug nehmen, häufiger mit einem besseren Integrationsgrad der Struktur in Zusammenhang.

Diskussion: Erst durch das Hinzuziehen des Kontextes und die somit erzielte differenzierte Betrachtung der negativen Affekte, ergibt sich ein klinisch relevanter Zusammenhang zum Strukturniveau.

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Keywords

Facial Expression of Emotion – FACS – Reference of Facial Affect – RFE – Operationalized Psychodynamic Diagnostics – OPD – Level of Structural Integration

Summary

Objectives: For a clinically relevant understanding of facial displays of patients with mental disorders it is crucial to go beyond merely counting frequencies of facial expressions, but include the contextual information of the expression. We assume that patients with different

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levels of structural integration differ in the contextual embedding of their negative facial expressions of emotions.

Methods: Facial affective behaviour of 80 female participants during an OPD interview was analysed using FACS (Facial Action Coding System) and the RFE coding system (References-of-Facial-Expression coding system; Bock et al. 2015). Using the RFE coding system, 2192 negative facial expressions of emotions were attributed to different references (e.g., interactive, self-related, object-related) by relying on contextual variables.

Results: Pure frequency of negative facial affect was not related to level of structural integration. Negative facial expressions of emotions directed towards the interviewer (*interactive reference*), as well as negative facial expressions directed towards the displayer's whole self were associated with lower levels of structural integration. In contrast, negative facial affects directed to single aspects of the self, to single aspects of objects, or to external situations were associated with higher levels of structural integration.

Conclusions: The differentiation of references of facial affective behavior allows a deeper understanding of the connection between facial displays and structural levels of psychic integration.

1. Introduction

The level of structural integration axis (LSIA) of the Operationalized Psychodynamic Diagnosis system (OPD-Task-Force 2008) describes an individual's basic mental capacities. According to OPD-LSIA, structural functions are not only linked to the inner world of an individual, but also to the external world of social relationships, that is, to both self and objects. Structural integration is therefore described in terms of four basic functions, each of which is differentiated with regard to the self and others: *perception* of self and objects, *regulation* of self and relationships, *emotional communication* with the internal and external world, and *attachment* to internal and external objects. OPD-LSIA therefore contains eight dimensions. This OPD concept of structural integration has been known and widely used for more than 15 years, mainly in the German-speaking area. Recently, a highly similar construct made its way into the DSM-5 in the form of the Levels of Personality Functioning Scale (American Psychiatric Association 2013). Zimmermann et al. (2012, 2014) found conceptual and empirical similarities between the OPD-LSIA and levels of personality functioning according to the DSM-5.

The inclusion of facial affective behaviour in the OPD-LSIA-manual is based on theoretical considerations rather than empirical findings. Krause and Fabregat-Ocampo (2002) provided a first overview of the connections between facial expressions and levels of structural integration. They assumed that the facial expressions of patients with low and disintegrated structural integration are confusing and are often misunderstood when the clinician fails to take notice of the patients' unconscious mental objects.

A controversial debate continues about the function of facial expressions in the tradition of emotion theories (e.g., Ekman 1992; Fridlund 1997; Russell 1994). However, there is a basic consensus about the essentiality of contextual information in

understanding the meaning of a facial expression. Approaches towards the understanding of the function of facial expressions were, for example, developed by Scherer and Wallbott (1990) and Krause (1990; 1997), who adapted the “organon-model” of Bühler (1934), a model that originated in semiotics, for the function of facial expressions. According to this theory, a facial affective expression can have three possible functions. (1) The *expressive* function: the facial expression displays an inner emotional state; (2) the *symbolic* function: the facial expression refers to a cognition or an object that is spoken or thought about; and (3) the *appeal* function: the facial expression is a signal directed towards the interaction partner. These three functions can only be separated theoretically. In real interactions, functions are mixed and fluctuating. Every single facial expression is multifunctional. Regardless of whether or not a negative expression of disgust is actually meant as an interaction signal, an interaction partner might interpret it as such. Bänninger-Huber (1996) refers to this as the “overdetermination” (p. 55) of a facial expression, or as Ellgring (1989, p. 6–7) put it: *“Two important components are covered: One is the ‘indicative function’ where psychological processes become potentially manifest in the behaviour. The other is the ‘instrumental function’ which points to the social consequences of the behaviour during interaction. This includes the potential to transmit information via behaviour and, thus, an influence on the other. . . . Both functions are simultaneously present in a behaviour proper.”* We therefore assume that a single facial expression can always be accompanied by an inner emotional state, but that this is not necessarily the case.

Facial affective behaviour as a component of emotion can be seen as an “interface” (Scherer 1984, p. 295) between our internal and external world. Facial displays as “interface” play an important role in self-regulation and the regulation of relationships (Bänninger-Huber 1996; Benecke 2014; Benecke et al. 2005). Patients with low levels of structural integration are characterized by deficits in their self-regulatory capacities as well as in the regulation of their relationships. Thus, it can be hypothesized that facial affective behaviour is related to one’s level of structural integration (OPD-Task-Force 2008).

Research on the facial expressions of individuals with mental disorders in a naturalistic conversational setting (e.g., therapeutic setting, or interview setting) is rare. An overview of existing studies can be found in Peham et al. (2015). Some studies (Berenbaum & Oltmanns 1992; Gehricke & Shapiro 2000; Kring & Earnst 1999; Renneberg et al. 2005) analysed frequencies of facial affective displays in patients belonging to different diagnostic groups, finding mostly reduced overall expressivity in individuals with mental disorders. Peham et al. (2015) did not find differences between diagnostic groups. Investigations concerning the context of facial expressions of emotions in patients with different structural levels of mental disorders are even rarer. Only two previous studies specifically investigated facial affective behaviour in patients with different levels of structural integration (Koschier 2009; Schulz 2001), and both analysed the frequencies of facial expressions as well as the complexity, which was calculated on the basis of the number of facial muscle innervations per expression. Schulz (2001) found reduced frequency and less variability in the facial expressions of participants with lower levels of structural integration. Koschier

(2009) could not replicate these findings; she found increased facial expressivity in participants with a moderate level of structural integration compared to those with high and with low levels of structural integration. Given these non-significant and partially contradictory empirical results, it seems insufficient to analyse facial expressions without taking contextual variables into account. This is especially unsatisfactory since we do sense irritation of clinicians in contact with severely disturbed patients that may be traceable to deviations in their facial affective behaviour. Benecke (2002; 2006), Merten (1996), Bonanno and Keltner (2004), and Gebhardt et al. (2016) conducted investigations of facial expressions that included contextual information (e.g., simultaneous dyadic gazing and verbal content). Their approach was to separately analyse verbal contents via transcripts, and facial and other nonverbal data on the basis of the video material. In a second step, these two analyses were merged without further validating this merger in the actual video. This could be problematic because it must be considered that these are not the only contextual cues that lead us to an interpretation of a given facial expression; other factors, such as intonation, speech fluency, prosody, reaction of the interlocutor etc., can also be critical.

In a previous work, we counted the frequencies of negative facial expressions in the current sample of patients with different mental disorders and healthy controls, finding no meaningful differences between diagnostic groups. Therefore, the aim of the present study was to take a closer look at negative facial affective expressions, their specific occurrence and contextual cues using the RFE coding system (Bock 2011; Bock et al. 2015). We hypothesized that the negative affective facial expressions of patients with lower levels of structural integration would have characteristic references.

2. Methods

2.1. Sample

For the present study, a subsample of 80 women (aged from 18 to 57 years; $M = 32.04$; $SD = 11.99$) was gathered out of a larger sample in a research project on emotional and interpersonal processes in mental disorders (Benecke et al. 2009; Peham et al. 2015).

The majority ($n = 64$) were inpatients recruited at the Medical University of Innsbruck's Clinic for Psychosomatic Medicine as well as three other psychosomatic clinics in Austria and Germany.

A minority of participants ($n = 16$) were healthy controls who were recruited via advertisements in newspapers. All assessments took place at the University of Innsbruck Department of Psychology or directly at the clinics. The procedure was approved by the Ethics Committee of the Medical University of Innsbruck, and an informed consent form was signed by all participants. Inclusion criteria were informed consent for videotaping and age above 18 years. Exclusion criteria were acute psychosis and schizophrenia. Each participant was diagnosed using the Structured

Table 1: Participants' main diagnosis, mean of number of comorbid diagnoses, and global level of structural integration

Main diagnosis *Number of comorbid diagnoses M (SD)	OPD-2 level of structural integration							
	Total	Good	Good/ Moder- ate	Moder- ate	Moder- ate/Low	Low	Low/ Disinte- grated	Disinte- grated
Healthy controls 0.00 (0.00)	16	2 (12.5)	10 (62.5)	4 (25.0)	–	–	–	–
Anxiety disorder 3.25 (1.16)	10	–	1 (10.0)	4 (40.0)	4 (40.0)	1 (10.0)	–	–
Depression 2.33 (1.96)	12	–	4 (33.3)	5 (41.6)	2 (16.6)	–	1 (8.3)	–
Somatoform disorder 2.33 (1.87)	9	–	3 (33.3)	4 (44.4)	2 (22.2)	–	–	–
Anorexia nervosa 3.60 (1.81)	10	–	–	2 (20.0)	6 (60.0)	2 (20.0)	–	–
Bulimia nervosa 2.20 (1.30)	8	–	–	4 (50.0)	4 (50.0)	–	–	–
Borderline PD 4.81 (1.83)	15	–	–	–	6 (40.0)	6 (40.0)	2 (13.3)	1 (6.6)
Sum	80	2 (2.5)	18 (22.5)	23 (28.7)	24 (39.0)	9 (11.2)	3 (3.7)	1 (3.7)

Note. n = 80; Percentages are in parentheses (); *italic: Mean of comorbid diagnoses = Sum of axis I and axis II disorders according to SCID; Standard deviations in parentheses.

Clinical Interviews for DSM-IV Axis I and II Disorders (SCID-I; German version: Wittchen et al. 1997; SCID-II; German version: Fydrich et al. 1997) by trained clinical psychologists. Sixty-four women fulfilled the diagnostic criteria of at least one mental disorder (on average M = 2.15 diagnoses for Axis I, and M = 1.34 for Axis II disorders). Sixteen participants did not fulfill the criteria for a mental disorder. Due to the high comorbidity among patients we defined main diagnostic groups. The logic for allocation to these groups is described in detail in Peham et al. (2015).

2.2. The level of structural integration according to OPD-2 (OPD-LSIA)

An in-depth clinical interview according to the principles of the Operationalized Psychodynamic Diagnostics (OPD-Task-Force 2008) was conducted with each participant. Interviews were conducted by two male and two female interviewers. All interviewers were trained and certified in applying the OPD. The average duration of the OPD interviews was about 90 minutes. All interviews were videotaped using the split-screen technique, focusing on patients' and interviewers' faces. These videos were the raw material for the coding of facial affective behaviour.

Table 2: Participants' distribution of global level of structural integration and of structural sub-dimensions according to OPD-2

	OPD-2 level of structural integration						
	Good	Good/ Moderate	Moderate	Moderate/ Low	Low	Low/Dis- integrated	Disinte- grated
<i>Global Level of Structural Integration</i>	2 (2.5)	18 (22.5)	23 (28.8)	24 (30.0)	9 (11.3)	3 (3.8)	1 (1.3)
<i>Self-perception</i>	5 (6.3)	22 (27.5)	25 (31.3)	16 (20.0)	8 (10.0)	3 (3.8)	1 (1.3)
<i>Object-perception</i>	2 (2.5)	22 (27.5)	30 (37.5)	16 (20.0)	7 (8.8)	3 (3.8)	0 (0)
<i>Self-regulation</i>	5 (6.3)	16 (20.0)	21 (26.3)	23 (28.8)	12 (15.0)	2 (2.5)	1 (1.3)
<i>Regulation of relationships</i>	5 (6.3)	17 (21.3)	22 (27.5)	20 (25.0)	12 (15.0)	3 (3.8)	1 (1.3)
<i>Communication with internal world</i>	5 (6.3)	15 (18.8)	25 (31.3)	18 (22.5)	13 (16.3)	2 (2.5)	2 (2.5)
<i>Communication with external world</i>	6 (7.5)	22 (27.5)	33 (41.3)	8 (10.0)	10 (12.5)	1 (1.3)	0 (0)
<i>Attachment to internal objects</i>	4 (5.0)	17 (21.3)	23 (28.8)	18 (22.5)	14 (17.5)	3 (3.8)	1 (1.3)
<i>Attachment to external objects</i>	3 (3.8)	24 (30.0)	21 (26.3)	17 (21.3)	12 (15.0)	2 (2.5)	1 (1.3)

Note. n = 80; Percentages are in parentheses.

On the basis of the OPD-LSIA, expert consent-ratings of each participant's level of structural integration were formulated by two trained OPD-raters, one of them a clinical psychologist, and the other a certified OPD trainer. Both raters did also conduct OPD-interviews themselves. A subsample of 20 participants was rated by an external third rater, who was a certified OPD trainer. The interrater-reliability for global level of structural integration was satisfactory with a weighted kappa between $\kappa = .67$ and $\kappa = .826$ (Benecke et al. 2009).

The OPD system provides detailed operationalizations of the level of structural integration and all its sub-dimensions, with 4 levels of psychic integration provided. Structural integration ratings were based on a 7-point scale ranging from 1 = good integration to 4 = disintegrated (with intermediate levels). The subject's level of structural integration was assessed across eight basic mental capacities: Perception of the self and others, regulation of the self and relationships, communication with the internal and external world, attachment to internal and external objects. Finally, the global level of structural integration was assessed. For details on psychometric properties of the OPD level of structural integration, see Benecke et al. (2009) and Zimmermann et al. (2010; 2012).

The 80 participants reached a mean global level of structural integration of $M = 2.20$ ($SD = .60$, ranging between 1 and 4). For the distribution of participants for each of the structural subcategories, see Table 2.

2.3. Coding facial affective behaviour with FACS and EmFACS

Facial affective behaviour was coded using the Facial Action Coding System (FACS; Ekman et al. 2002), an objective and reliable method for the coding of single facial movements of spontaneous facial behaviour. All coders in our study successfully completed the FACS final test as well as additional trainings to increase their skills in identifying and coding facial events in spontaneous face-to-face interactions (Peham & Bock 2009).

Coding facial behaviour with FACS is a time-consuming process. It takes approximately 2 to 3 hours of coding for a one-minute segment of video. Therefore, in the present study, coding was limited to two sequences (description of most important person, self-description) of about five minutes each from the semi-structured OPD interview. Since the duration of the coded segments varied, the data on frequencies of affective facial behaviours were adjusted to conform to 575 seconds for each interview.

The assignment of negative basic emotions (AUs and combinations) was performed using Friesen and Ekman's EMFACS predictions (EMFACS-7; Friesen & Ekman 1984). In the present study, we focused on the three aggressive facial expressions of basic emotions: anger, contempt, and disgust. For details on specific facial movement combinations within the negative basic emotions anger, contempt, and disgust, as well as on the frequency distributions of the total FACS-coded data from the overall research project, see Peham et al. (2015). To prove interrater reliability, three expert coders coded 15% of the material. Interrater reliability was good for the identification of facial events ($\kappa = .931$) and for the coding of basic emotions ($\kappa = .898$).

In our sample of 80 female subjects, a total of 2192 facial expressions of negative emotions were investigated: 132 anger expressions, 421 contempt expressions, and 1639 disgust expressions.

2.4. References of facial expressions: the RFE coding system

All 2192 negative facial expressions of emotions were coded with the RFE coding system. As part of the RFE coding system, each basic emotion is re-coded in a second step in which a reference is attributed to the facial display. To understand the reference of a facial expression, it is important to take into account more than the immediate simultaneous context of the display. Therefore, all possible sources within the interaction dyad were used (e.g., gaze-direction, verbal content, vocal intonation, prosody, temporal structures, reaction of the interlocutor, etc.) and combined to form the intuitive perception of the whole *gestalt*.

The RFE coding system provides 3 major categories: interactive (the facial expression is directed toward the actual interlocutor), self-referential (the facial expression refers to the self of the display; 4 subcategories), and object-referential (the facial expression refers to a person or situation; 5 subcategories). Facial expressions that cannot be attributed to one of the categories are summarized as "not classifiable."

In the following paragraphs, the categories of the RFE coding system are described in more detail. When possible, translated examples are used (the word in *italic* indicates the simultaneously shown negative facial expression).

Interactive reference: The facial expression is directed towards the interlocutor in the here-and-now. The negative facial expression is a negative statement towards the interlocutor. The negative facial expression is often shown combined with gazing towards the interlocutor, and without verbal hints to other references. Furthermore, for coding this category the reaction of the interlocutor is often important, with self-regulating phenomena such as lip wiping, scratching the head, lip biting, or swallowing typically shown.

In the *self-referential* category, the facial affective expression refers to the self of the displayer. The following subcategories are included. *Self-as-a-whole:* Negative facial expressions refer to the whole self of the displayer, evaluating the whole person in a negative way (“I am totally worthless.”). *Self-aspect:* Negative facial expressions refer to aspects of the self, such as characteristics, symptoms, or traits (“I can’t believe that I was so naïve back then!”). *Self-imitation:* Within the verbal content, the displayer is imitating himself or herself and displays a negative facial expression while doing so (“And then I told my dad: *Up yours!*”). *Self-irony:* This category describes facial expressions that refer to the displayer’s self in an ironic way (“Yes, yes, I truly am an *incredible mum!*”).

In the *object-referential* category, the facial expression refers to objects or situations. The following subcategories are included: *Object-as-a-whole:* Negative facial expressions refer to whole objects that are spoken or thought about (“My *ex-husband* is a total loser!”). *Object-aspect:* Negative facial expressions refer to aspects of objects, such as characteristics or symptoms (“He is 26 years old and still lives at home and is extremely *dependent*”). *Object-situation:* This category refers to verbally described situations or circumstances without a specific object being mentioned (“Those just *were* very difficult times”). *Object-imitation:* Within the verbal content, an object is imitated and a negative facial expression is displayed while doing so (“And then my mum screamed: *Cut it out!*”). *Object-irony:* This category describes facial expressions that refer to an object in an ironic way (“My brother always was my mother’s *darling* anyway”).

The RFE coding system showed good interrater reliability, with a multi-rater kappa $\kappa = .887$ for the major categories and $\kappa = .765$ for the subcategories (for more details see Bock 2011; Bock et al. 2015). For the present study, RFE ratings were conducted by a clinical psychologist. This rater was not involved in the ratings of the level of structural integration of the OPD.

2.5. Statistical analysis

The distribution of frequencies of the RFE-codings on the single affect basis (anger, disgust, contempt) is shown in Table 3. For the following analyses, the three negative facial displays anger, contempt and disgust were summarized. Neither the RFE categories nor participants’ levels of structural integration were normally distributed; therefore, Spearman correlations were calculated. In order to reduce the risk of Type I error, we set significance at 0.01 (99% confidence intervals).

Table 3: Frequencies of negative facial affects and RFE categories

	Negative facial affects				
RFE categories	Anger	Contempt	Disgust	Total	Total in RFE main category
<i>Interactive</i>	10 (7.6)	5 (1.2)	69 (4.2)	84 (3.8)	84 (3.8)
<i>Self-as-a-whole</i>	25 (18.9)	120 (28.5)	252 (15.4)	397 (18.1)	842 (38.4)
<i>Self-aspect</i>	19 (14.4)	90 (21.4)	302 (18.4)	411 (18.8)	
<i>Self-imitation</i>	4 (3.0)	0 (0)	29 (1.8)	33 (1.5)	
<i>Self-irony</i>	0 (0)	0 (0)	1 (0.1)	1 (0.1)	
<i>Object-as-a-whole</i>	40 (30.3)	97 (23.0)	501 (30.6)	638 (29.1)	1161 (53.0)
<i>Object-aspect</i>	11 (8.3)	25 (5.9)	125 (7.6)	161 (7.3)	
<i>Object-situation</i>	10 (7.6)	55 (13.1)	264 (16.1)	329 (15.0)	
<i>Object-imitation</i>	3 (2.3)	2 (0.5)	25 (1.5)	30 (1.4)	
<i>Object-irony</i>	0 (0)	2 (0.5)	1 (0.1)	3 (0.1)	
<i>Not classifiable</i>	10 (7.6)	25 (5.9)	70 (4.3)	105 (4.8)	105 (4.8)
<i>Total</i>	132 (100)	421 (100)	1639 (100)	2192 (100)	2192 (100)

Note. Percentages are in parentheses.

3. Results

53% of the negative facial displays shown by participants were categorized as *object-referential*, while 38.4% of negative facial displays were rated as *self-referential*. Another 3.8% was rated as referring directly to the interviewer in the here-and-now, *interactive reference*. Out of the 2192 facial displays, 4.8% were *not classifiable*. As can be seen in Table 3, the categories *self-* and *other-imitation*, as well as *self-* and *other-irony*, rarely occurred. Therefore, we excluded these four sub-categories from subsequent analyses.

The mere frequency of negative facial displays without referential differentiation showed no significant correlation to levels of structural integration at either the global level or in terms of one of the eight structural sub-dimensions. In contrast, negative facial displays categorized by the RFE showed significant and differentiated correlations with the global level of structural integration and with its sub-dimensions (see Table 4).

The *interactive* displays as well as the *self-as-a-whole* displays showed the strongest positive correlations with the global level of structural integration and all structural sub-dimensions. Participants with lower levels of structural integration showed more negative facial displays (anger, contempt, disgust) with interactive reference and with reference to the *self-as-a-whole*. The RFE category *self-as-a-whole* showed stronger correlations with those structural sub-dimensions concerning the self (*self-perception*, *self-regulation*, *communication with internal world*, *attachment to inner objects*) than with the structural sub-dimensions concerning relationships and the external

Table 4: Spearman-rho correlations of RFE categories of negative facial affects (anger, contempt, disgust) and OPD-2 global level of structural integration and structural sub-dimensions

RFE categories	Global Structural Level	OPD-2 Structural Subdimensions							
		Perception of Self	Perception of Objects	Regulation of Self	Regulation of Relationships	Communication with Internal World	Communication with External World	Attachment to Internal Objects	Attachment to External Objects
Negative affects total frequency	.00	-.01	.05	.02	.03	-.03	-.05	-.05	-.06
Interactive	.28 ⁺	.33*	.28 ⁺	.25 ⁺	.29*	.29*	.25 ⁺	.29*	.33*
Self-as-a-whole	.43**	.40**	.32*	.48**	.41**	.45**	.26 ⁺	.38**	.34*
Self-aspect	-.09	-.10	-.12	-.07	-.10	-.13	-.25 ⁺	-.14	-.15
Object-as-a-whole	.22 ⁺	.15	.23 ⁺	.22 ⁺	.23 ⁺	.15	.15	.17	.19
Object-aspect	-.32*	-.28 ⁺	-.23 ⁺	-.23 ⁺	-.30*	-.24 ⁺	-.31*	-.29*	-.29*
Object-situation	-.37**	-.35*	-.28 ⁺	-.31*	-.34*	-.41**	-.33*	-.40**	-.39**

Note. ** $p = .001$; * $p = .01$; ⁺ $p = .05$; Spearman-rho. Positive correlations indicate that RFE categories appear more frequently in subjects with lower levels of structural integration.

world (*object-perception, regulation of relationships, communication with external world, attachment to external objects*). For the RFE category *object-as-a-whole*, we found tendentially positive correlations with the global level of structural integration, as well as with three out of eight structural sub-dimensions: *object-perception, self-regulation, and regulation of relationships*. Facial displays shown in the reference categories *self-aspect, object-aspect, and object-situations* correlated negatively with level of structural integration. This indicates that subjects with higher levels of structural integration more frequently displayed negative facial expressions in these categories; thus, they directed their facial anger, contempt, and disgust more often to *single aspects* of themselves, of other persons, or of specific situations.

4. Discussion

The aim of this study was to investigate whether negative facial affective displays (anger, contempt, disgust) shown during OPD interviews, differentiated according to reference, correlated with the level of structural integration and its structural sub-dimensions.

As previously shown (Peham et al. 2015), merely counting the frequencies of negative facial affects did not reveal any differences between healthy and mentally ill individuals, or between different diagnostic groups, and is not related to symptomatic severity scales. In this study, we went one step further by attributing references to negative facial displays using the RFE coding system (Bock 2011; Bock et al. 2015). In doing so, we found meaningful and interpretable connections between different references of negative facial affective behaviour according to RFE and levels of structural integration according to OPD-2.

Negative facial expressions in *interactive reference* could be observed more frequently in participants with impaired structural capacities. This fits in well with the results of Gebhardt et al. (2016), who found that facial disgust expressed with gazing towards the interviewer is indicative for expert-rated structural impairment. Furthermore it fits well to clinical descriptions of patients with low levels of structural integration, like patients with borderline personality disorder or other severe mental disorders. These patients are characterized by acting out, aggression, breaking off relationships, and impulsive behaviour. Similarly, in the micro-analytic investigation of facial affective behaviour, aggressive acting out and negative affects directed towards the interviewer could be found among participants in this group. Negative affective experiences cannot be regulated intra-psychically and must therefore be regulated interpersonally, impeding the patients' relationships. The frequent occurrence of difficult counter-transference and impulses to react within the interlocutor could partly be due to these *interactive* aggressive facial signs. Another impairment described for individuals with low levels of structural integration is a limited capacity to feel and understand their emotions and the emotions of others. This misunderstanding of others' affective signs may result in overly hasty and hostile reactions, leading to interpersonal problems. In turn, fierce affective reactions by the interloc-

utor may be required by patients with impaired structural integration as a mirror of their own affectivity. As put by Fonagy et al. (2002, p. 386): “*Not being able to feel themselves from within, they are forced to experience the self from without.*”

The RFE category *self-as-a-whole* showed the strongest positive correlations with the OPD levels of psychic structure. These negative facial expressions of emotion referring to the whole self-convey a very strong devaluation or attack of one's own person and could be interpreted as a repeatedly occurring micro-self-injury. Showing negative facial displays referring to the *self-as-a-whole* could be seen as characteristic for severe structural impairment.

The differentiated picture that resulted from the analysis of structural sub-dimensions and references of negative facial displays may be seen as a sort of validation for both instruments. As seen in the RFE category *self-as-a-whole*, correlations were lower with the object-related OPD structural sub-dimension (e.g., *communication with external world*) than with self-related structural sub-dimensions.

The negative correlations between the RFE categories *self-aspect*, *object-aspect*, and *object-situation* and levels of structural integration (note: negative correlations indicate high occurrences of these RFE categories in participants with higher structural levels) gives a differentiated picture of how negative facial affective behaviour is connected to structural integration. Individuals with higher levels of structural integration do not show fewer negative facial affects (see also Peham et al. 2015), but their negative facial affects have different references. Negative facial affects in these RFE categories can be understood as illustrations of mentally represented content, vivid communication tools for successful interactions, and affective involvement. Negative facial displays referring to *aspects* of one self and others, or situations shared with others, are not as holistically devaluing as the *interactive*, *self-as-a-whole*, and *object-as-a-whole* references shown by participants with severe structural impairment.

This study has several limitations. First of all, the sample consisted only of female participants. Gender differences in the references of negative facial displays should be taken into account, since there is thorough evidence that women are generally more facially expressive compared to men (e.g., Hall 1984). With 80 participants, the sample is small but still commensurate for a unique time-consuming study of facial expressions. It should also be noted that RFE rating is a non-blindable technique because the rater needs to look at the entire interview before coding the references of the facial affects. Thus, although RFE coders had no information about diagnoses or OPD ratings, they might have gotten a clinical impression of the general functioning of the coded subjects. Even though we found no differences in the frequencies of negative facial affects comparing the different sections of the OPD interview (Bock 2011; Peham et al. 2015), it could be assumed that by limiting the analyzed sequences to the description of the most important person and the description of the self, our data was influenced, e.g., in that way that the self-description may account for the high number of self-referential facial expressions.

Nevertheless, in our view, this study shows that the RFE coding system allows for a deeper understanding of facial affective research. In particular, our findings linked the results of negative facial expressions of emotions to clinical phenomena. In the

context of psychotherapy, for example, the sensitisation for patients' facial affects and the associated references could be of importance. We assume that part of the therapists' negative counter-transference feelings may be more understandable through specific characteristics of the patients' facial affective communication, especially his or her interactive aggressive facial affects. Therapists may be subconsciously influenced in different ways by these "facial micro-aggressions" either directed towards the therapist's person or towards the patient's self.

We draw the conclusion that the differentiation of references allows a deeper understanding of the affective behaviour. This is especially important when investigating facial expressions of individuals with mental disorders.

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