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Emotions Elicited by an Animated Short Film

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Abstract

The aim of this study is to inform ongoing theorizing and empirical work on emotions elicited by fictional movies. I used facial expressions of the viewers of an animated short film as indicators of cognitive appraisals. I derived five research questions from psychological theories dealing with emotions elicited by movies. 134 participants watched an animated short film in a naturalistic setting. I used the *Facial Action Coding System* to analyze recordings of participants' faces. I took all facial movements into consideration. More than 4,000 movements of facial muscles were coded. The results speak of the important role of A-emotions (artifact emotions) and indicate that interest is an important F-emotion (fiction emotion). The subjective ambivalence of mixed emotions often results from oscillations between (rather than from a true overlap of) different kinds of affect. The reception is strongly driven by normative appraisals of different aspects of a movie.

Keywords: Artifact, emotions, basic emotions, facial expression, fiction emotions, mixed emotions, moral emotions

Introduction

Film theorists have developed a number of conceptualizations of emotions elicited by movies. They have offered different opinions concerning the peculiarities of emotions elicited by movies. Carroll (1997) suggested that movies arouse emotions similar to emotions in daily life. However, he states, viewers rarely share the goals, emotions, and perspectives of the characters on screen. He stated that emotions elicited by fictional movies are "similar to [those] of onlookers or observers, not participants" (p: 160; see also Tan, 1995). On the contrary, Grodal (2009) was critical of the fact that many theories of film viewing hail from the presupposition that movies are experienced from an observer's point of view. According to Grodal - based on his evolutionary informed perspective - not only *third-person emotions* (e.g., compassion) have to be taken into account, but *first-person emotions* (e.g., fear or sadness) are also experienced because viewers often simulate the diegetic world from an immersed point of view (p. 204). G. Smith (2003) presented an approach in which he argued that not only short-term emotions, which have a specific object, but also long-lasting moods play an important role in movie watching. Plantinga (2009) adapted this differentiation by incorporating so-called *local* and *global* emotions in his list of emotions elicited by movies (p. 69). And finally, M. Smith's (1995) core statement was that evaluations of the morality of the characters' actions are an elementary and basic ingredient of emotion elicitation in film viewing. Thinking about morality has been central to film theory ever since (see also Currie, 1995; Carroll, 2002) and appears to be quite a modern issue (Vaage, 2016) in the light of the success (i.e., huge audiences) of transgressive characters in recent high-

quality TV series.

In comparing all these approaches, theorizing about emotions elicited by movies has resulted in the following commonalities: First, all theories are based on cognitive accounts of emotion elicitation in which appraisals or evaluations of events, persons, or objects in a movie trigger a variety of emotions. Second, all theories place the fictional characters and the thematic structures in the foreground as the emotion-eliciting events in a movie. Third, differential perspectives on the viewers, who might not experience the same emotions when watching a particular movie, have only rarely been mentioned. An exception is Plantinga (2009, p. 223). Another is G. Smith (2003) who stated that some viewers may reject the "invitation to feel" (p. 12). In addition, it is striking that all theories have primarily focused on the classical Hollywood-style movie, which possesses a relatively clear causal structure and relatively easily accessible constructions of characters' goal-oriented actions (see also Schick, 2017). In sum, there seems to be a tacit consent in film theory that emotions elicited by movies are seen as not principally different from those elicited in daily life. The presumed similarity between emotions elicited by movies to emotions elicited in daily life is more or less explicitly attributed to information processing, which is assumed to be the same in both cases. Regarding the intensity of the emotions, books written by film theorists concerned with emotions elicited by movies give the impression that most theorists share a fascination with the complex, extraordinary, and intense emotions that movies are able to elicit.

The pages that follow should contribute to the ongoing discussion about the peculiarities of emotions elicited by movies. First, I systematize my theoretical background of emotion

psychology to derive the research questions. I will address these questions with a detailed and comprehensive description of the facial expressions of the viewers of an animated short film. Therefore, in the next steps, I describe the acquisition of the facial expressions and present the results. Finally, the implications and the main limitation of the exploratory study are critically discussed.

2. Theoretical Background

2.1 Basic Emotions

Conceptualizations of emotions elicited by movies coming from film theory as well as those developed in communication research and empirical aesthetics build on cognitive accounts of emotion elicitation in which appraisals of filmic events trigger emotions. In emotion psychology, two major positions compete with each other. So-called *discrete* emotion theories postulate phylogenetically evolved, genetically encoded, and universal affect programs for basic emotions (e.g., fear, sadness, and happiness). These produce prototypical response conFiguretions, including specific patterns of facial expressions (e.g., Ekman, 1992).

The so-called *componential* emotion models claim that particular elements of facial expressions result from appraisals. However, "componential models do not fundamentally question the idea that facial expressions mark differentiated emotional states; rather, they propose that emotions have an *emergent* character" (Scherer & Ellgring, 2007, p. 115). Scherer (2001) defined emotions in his componential model as "*an episode of interrelated, synchronized changes in the states of all or most of the five organismic sub-systems*" (p. 93): the cognitive appraisal,

the physiological arousal, the motor system (and the facial expression as part of this system), the subjective feeling, and the motivational system. Scherer (2001) conceptualized an emotion as a process of sequential appraisals that result in a certain pattern of outcomes in these emotion response systems. That is, an emotion is not due to the eliciting event itself but to the ongoing evaluation of the event by an individual (*stimulus evaluation checks*). The individual appraises the event in terms of relevance (novelty and intrinsic pleasantness), implications (expectations and goal conduciveness), coping potential or controllability, and norm compatibility. The process of appraisal itself is a cognitive process and is, at the very least, difficult to access via verbalization. But each appraisal evokes an adequate reaction in the emotional sub-systems. For a number of outcomes of the stimulus evaluation checks, Scherer and Ellgring (2007) predicted related changes in the motor system, namely, in facial expressions (see also Kaiser & Wehrle, 2001; Wehrle et al., 2000). For example, appraising an event as novel is related to raising the eyebrows, or appraising an event as pleasant is related to pulling the lip corners upward as in a smile.

Appraisals have objects, and for movie reception, various objects of appraisals have to be taken into account. Stimulus evaluation checks may be related to the story told in a movie (e.g., a viewer evaluates war scenes shown in a movie as difficult to cope with; coping-potential check). Stimulus evaluation checks may also be related to the making of the movie (e.g., a viewer evaluates the stage managing of a soldier's bravery as the screenplay writer's or the director's good idea). Finally, the viewer's own emotions can be the object of re-appraisals (e.g., a viewer wonders whether he was bored by the war scenes). Taken together, the different stimulus evaluation checks and the

different objects of the appraisals and the facial expressions that indicate particular appraisals (Scherer & Ellgring, 2007, p. 128; table 6) offer a grid that provides a useful orientation for deriving research questions for the intended exploratory analyses of facial expressions during the reception of an animated short film.

Discrete emotion theories have postulated and componential emotion theories have not questioned a number of distinct emotions that can be defined via a particular combination of movements of facial muscles (Ekman & Friesen, 1978; FACS Investigator's Guide, p. 174). The basic emotions are happiness, sadness, surprise, fear, anger, and disgust. Sadness, for example, involves activities of up to four facial muscles. One intention of the current paper is to answer the question of whether *basic emotions can be observed during movie reception, and if yes, to what extent* (Research Question 1).

2.2 F-emotions and A-emotions

Regarding emotions elicited by movies, Tan (1996, p. 65f.) distinguished between the so-called *F-emotions* (fiction emotions) and *A-emotions* (artifact emotions). His psychological approach was based on Frijda's emotion theory (e.g., 1988; 2006) and has also been widely accepted in film theory (e.g., Plantinga, 2009, p. 69). Tan suggested that in movie reception, the content of the movie as well as elements of the movie as a man-made artifact can elicit emotions. As content and formal features are strongly intertwined in movies and their reception, negative affect caused by content elements may go hand in hand with positive affect caused by formal features (and vice versa). According to Tan (1996, p. 53), the classical Hollywood-style film generates its immersing effect by hiding stylistic patterns.

Therefore, he argued that the viewer is primarily interested in what is happening in the fictional world and only incidentally appreciates the artifact.

According to Scherer and Ellgring (2007), the lip corner puller (so-called *Action Unit* 12 or AU 12) is a facial expression that indicates an appraisal of pleasantness and - when combined with the cheek raiser (AU 6) - an appraisal of goal conduciveness (1). Such smirks or smiles can indicate the pleasantness or goal conduciveness of formal features but also of the content of a particular movie scene. In movies, content and form are always strongly intertwined, and thus, it is difficult if not impossible to identify scenes in which the form is clearly dominant and the content is at least vague at the same time (or vice versa). To advance further research on A-emotions, the second intention of this contribution is *to explore which variables characterize viewers who smile often* (Research Question 2).

Regarding F-emotions, Tan (2000, p. 120) claimed that when experiencing movies or art in general, the dominant emotion is *interest*. Plantinga (2009) empathically argued against this claim: “I have reservations about identifying interest as a discrete emotion that is the fundamental global emotional experience of film viewing. Interest, if we assume that it is indeed an emotion, is so broad and far-ranging that it is nearly shapeless” (p. 69). Many other emotion psychologists have opposed the view that interest is an emotion as well (e.g., Lazarus, 1991). However, interest is more than merely a cognitive state. According to Tan (2000, p. 120), the difference is that interest includes an action tendency to provide attention and effort that persists in the face of distracting stimuli. According to Silvia (2005a, 2005b), interest has all the features typical of an emotion. Most important, interest has a stable pattern of

cognitive appraisals. “In short, if people appraise an event as new and as comprehensible, then they will find it interesting” (Silvia, 2008; see also Juslin, 2013, p. 261). According to Silvia (e.g., 2008), interest is indicated by novelty appraisals. In Scherer and Ellgring’s (2007) systematization of indicators of different appraisals, the combination of the inner (AU 1) and the outer brow raiser (AU 2) indicates a sudden novelty. A combination of the brow lowerer (AU 4) and the lid tightener (AU 7) indicates an appraisal of unfamiliarity or unpredictability. Both appraisals should frequently be observed in viewers when reception processes are driven mainly by interest. To gather evidence for or against the claim for interest as the dominant emotion in movie reception, I determined *the frequency of expressions that indicate sudden (AU 1+2) or unfamiliar and unpredictable (AU 4+7) novelty* (Research Question 3).

2.3 Mixed Emotions

In other disciplines, too, emotions elicited by movies have been and still are an important topic. Especially the notion of the so-called *sad-film paradox* (Oliver, 1993) has stimulated researchers in the field of communication research to focus on emotions elicited by movies. The sad-film paradox describes the fact that viewers of sad films can be entertained in a positive sense in spite of the negative feelings aroused by the sad content. The most established explanation for the sad-film paradox is that the negative emotions are appraised as positive in a safe reception situation. This re-appraisal of a viewer’s own emotions then allows the viewer to be entertained. Researchers who have followed Oliver’s proposal favored the concept of so-called *meta-emotions* to describe the re-appraisal of elicited emotional

states (e.g., Bartsch et al., 2008; Schramm & Wirth, 2010) (2). Oliver et al. (2012) suggested that, although sadness is one component of affective reactions to movies, many audience responses may be described via *mixed* affect. Specifically, Oliver and colleagues (2012) conducted questionnaire studies that showed that the emotion *elevation* is elicited by movies in which moral virtues (e.g., altruism) are portrayed (p. 361). Also, researchers interested in aesthetic experiences have attempted to further explain the sad-film paradox. Hanich et al. (2014) empirically demonstrated that the emotion *being moved* is a mediator of the correlation between sadness and enjoyment. The emotions *elevation* and *being moved* share the element that negative and positive affect are mixed in these distinct emotional experiences (Menninghaus et al., 2015).

Most research on mixed emotions elicited by movies has relied on data gathered via questionnaires. Oliver et al. (2012) stated:

> Research in this area would benefit from assessing responses in more naturalistic settings and to ongoing (rather than recalled) viewing. Likewise, the use of more nuanced measures such as physical indicators of emotion . . . may help to address any retrospective biases that may be present in . . . self-report measures. (p. 376)

Furthermore, Menninghaus et al. (2015) concluded: "Clearly, much further research is needed regarding the temporal trajectories, physiology, ... potential expressive components, and motivational tendencies" (p. 27). Thus, research has yet to determine whether mixed emotions appear often or only seldom during movie reception and what specific kinds of affect appear at the same time. In the current study, I sought to determine *the frequency of overlapping facial expressions that are related to*

different kinds of affect and to explore their temporal trajectories (Research Question 4).

2.4 Moral Emotions

Smith (1995) argued that evaluations of the morality of characters' actions are an elementary and basic ingredient of emotion elicitation in film viewing. In Scherer and Ellgring's (2007) systematization, the dimpler (AU 14) indicates an appraisal of violated internal norms. This facial expression has also been discussed as an indicator of the moral emotion *contempt.* When watching a movie or a TV series, we are very often called upon to appraise the behavior of others violating a third party (Haidt, 2003). The negative, other-evaluative, moral emotions are contempt, anger, and disgust (Rozin et al., 1999). They are reactions to violations of other human beings. They all involve the disapproval of those who behave incorrectly. Hutcherson and Gross (2001) write: "We might say that we are angry at injustice, disgusted by a heinous murder, or contemptuous of corrupt politicians" (p. 719). The negative moral emotions are also elicited when we observe the behavior of fictional characters. The object of moral evaluation might not be only the character in a movie but also the actor who does not play with his heart or the filmmaker who tries to control the audience too much. According to Rozin et al. (1999), contempt has its own unique facial expression: a curling or tightening of the lip corners; and most important, this occurs only on one side of the mouth (the *unilateral* AU 14; see also Ekman, 2007). The expression often co-occurs with a slight head raise and tilt, showing that someone is "looking down one's nose" (Matsumoto, 2008, p. 113) at the other and turning away at

the same time. Although contempt is often considered to be a negative emotion, it also involves positive feelings about one's own self-worth. In later publications, Ekman (e.g., 2007) added contempt to his list of basic emotions. Contempt has been described as "the most nebulous" (Hutcherson & Gross 2011, p. 733) and the "most subtle and coldest of the three [negative and other-critical] moral emotions" (Rozin et al., 1999, p. 575). These insights from emotion psychology suggested a last research question: *How often can the proposed indicators of appraisals of violated internal norms (the bilateral AU 14) and indicators of the emotion* contempt *(the unilateral AU 14) actually be observed in movie reception?*

3. Study

3.1 Participants

147 persons (94 female) participated in the study. They were recruited through printed and electronic advertisements. They were told that while they watched advertisements and a short film, physiological parameters (e.g., heart rate) would be measured. They did not receive payment for their participation. They gave their informed consent to be videotaped before the study. 13 participants were excluded from further analysis of the facial expressions for various reasons: Some had health problems (cough, fatigue: 8 participants); some recordings could not be used due to technical problems with the camera zoom (3 participants); and finally, two participants were chewing gum. The age of the remaining 134 participants (87 female) ranged from 18 to 54 years (M = 26.92; SD = 7.08). 69.4% of the participants were students attending different universities in Berlin, Germany.

3.2 Modes of Reception

To account for inter-individual variability in emotional reactions to movies, I needed not only variables that could differentiate people on general criteria (e.g., gender or age) but constructs that were developed specifically to differentiate groups of movie viewers. So-called *Modes of Reception* (Suckfüll, 2004) are information-processing strategies or routines that each viewer establishes throughout her or his media-related socialization and learning process. On the basis of theoretical considerations and in successive questionnaire studies, I developed and tested a model and measurement instrument representing four interrelated Modes of Reception for fictional films: *Identity Work*, *In-Emotion*, *Imagination*, and *Production* (Suckfüll, 2004; Suckfüll, 2013; for items and their reliability and validity, see Suckfüll & Scharkow, 2009). *Identity Work* represents a form of reception that is induced by comparisons with fictional characters and fictional events (example item: "I compare events in a film with my own experience"). The term *In-Emotion* is a neologism introduced to "underscore the peculiarity of emotions elicited while the recipient feels *in* a fictional world" (Suckfüll & Scharkow, 2009, p. 372f.; example item: "I let myself be swept away by the film"). *Production* is a more distant Mode of Reception that is characterized by thoughts about production issues (example item: "I think about how certain scenes came about"). Recipients with high values on the mode *Imagination* often report being distracted from the happenings on screen because they are engaged in imaging, for example, an alternative ending (example item: "I make up my own version of the plot"). Movie viewers repeatedly apply their dominant Modes of Reception to various movies. Having a

disposition reflecting a particular Mode of Reception is essentially independent of the actual reception process but is related to previous media selection and viewing experiences. This differentiates the scale from other scales that intend to measure the viewers' experience *after* the reception of a movie (e.g., narrative engagement: Busselle & Bilandzic, 2009).

3.3 Movie

I chose the movie *Father and Daughter* (Michael Dudok de Wit, 2000) as the stimulus. A scene at the beginning of the film shows a man (the father) leaving a girl (his daughter) behind as he rows away in a boat for unknown reasons. This scene exposes loss or separation as the central theme of the film. In a series of eight similar scenes, the daughter returns on her bicycle to the place on the shore from where her father's boat left. There she looks out, seemingly longing for his return. The repetition of these similar situations reinforces the daughter's inner conflict: The father's leaving represents an essential loss in her life, and her attempts to deal with this loss are futile, even by the time the girl has become an old woman. At the end of the film, as an old woman, she goes down the hill and into the water; she appears to commit suicide. At this point, the film switches to a dream world: The water changes to grass, and she finds her father's empty boat in it. She lies down in the boat, and then stands up and sees her father again (see also Suckfüll 2010; 2013). *Father and Daughter* is an animated short film with minimalistic drawings. The film is silent and accompanied by music. The main reason I chose this movie, which won an academy award in its category, was that it could be expected to evoke strong emotions in many participants while adhering to clear narrative structures and conventions of melodrama. In the study, the short film was preceded by a cinema-like pre-program consisting of a number of

commercials. This allowed the participants to adjust to the setting.

3.4 Setting

The data were gathered in the *Cinebox*, a mini-cinema. The superordinate aim of the setting is to ensure the greatest ecological validity possible: The movie was presented on a screen surrounded by a black velvet curtain; the participants sat in comfortable, red cinema chairs. Different data collection methods were combined: During reception, heart rate and skin conductance were measured, and facial expressions and body movements were recorded with two infrared cameras (in the darkened room). The cameras were positioned above and next to the screen. After the film, interviews were conducted by confronting the participants with their own reactions. Data recording in the *Cinebox* is possible for only one participant at a time (i.e., the participant watches the movie alone in the little cinema). This reduces ecological validity (compared with the atmosphere created by an audience in a regular cinema), but participants' reactions are not influenced by the behavior of other viewers. The conditions were standardized across all participants. Experimenters in the next room supervised the sessions via the camera recordings.

3.5 Coding

The recordings of the participants' faces were analyzed with the *Facial Action Coding System* (FACS) developed by Ekman and Friesen (1978). A FACS coder deconstructs an observed facial expression into Action Units (AUs). AUs are movements of particular facial muscles. FACS describes 9 AUs in the upper face and 8 up or down, 2 horizontal, 3 oblique, and 5 orbital

actions in the lower face, as well as all possible combinations of these movements and their precise coding. In addition, many miscellaneous actions and supplementary codes as well as detailed head and eye positions and movements are described. “FACS is the most molecular system in terms of coding the muscular AUs used in emotional expression and can be used independently of prior assumptions concerning specific emotional expressions” (Scherer & Ellgring, 2007, p. 115, footnote).

Three certified coders (the author and two research assistants) worked in a blind trial (i.e., without knowing which scene of the movie caused the reactions). The recordings of the faces of all 134 viewers of the full length of the movie were coded. The FACS coding was complete, that is, each movement of all facial muscles described in the FACS manual was coded, including head and eye movements as well as miscellaneous actions and supplementary codes. The frame-specific beginnings and endings as well as the intensities of the facial expressions were determined. In FACS, intensities are not measured on a metric but on an ordinal scale with the values: trace, slight, marked/pronounced, severe, extreme/maximum. The three coders worked independently of each other; they were however allowed to discuss complicated facial movements with the other coders. They met regularly for the coding and worked in one room in order to enhance motivation. Each coder was responsible for approximately one third of the recordings of the faces. The participants exhibited very different frequencies of AUs, which ranged from 8 to 156 AUs ($M = 43.16$, $SD = 25.00$).

3.6 Results

3.6.1 Frequencies of Action Units, Appraisals, and Emotions

4,302 Action Units, 1,205 head movements, and 396 eye movements were coded. Table 1 presents the most often coded Action Units and their combinations and intensities relevant for answering the research questions.

Table 1. Frequencies of Action Units, Appraisals, and Emotions (n = 134)

Action Unit	Description	Frequency
AU 14	dimpler	436
	unilateral	114
AU 07	lid tightener	348
AU 12	lip corner puller	344
	unilateral	40
AU 26	jaw drop	268
AU 04	brow lowerer	262
AU 24	lip pressing	245
AU 25	lips part	242
AU 01	inner brow raiser	191
AU 02	outer brow raiser	175
AU 06	cheek raiser	162
AU 18	lip pucker	156
AU 38	nostril dilator	155
AU 17	chin raiser	154
AU 28	lips suck	153
AU 05	upper lid raiser	131
Intensity*	Description	Frequency
A	trace	504
B	slight	1745
C	marked/pronounced	742

D	severe	194
E	extreme/maximum	34
Head Movements	Description	Frequency
M 56	head tilt right	224
M 53	head up	159
M 55	head tilt left	142
M 54	head down	141
Gross Behavior	Description	Frequency
80	swallow	345
Smiles	Combinations	Frequency
	AU 12	144
	AU 6+12	147
	AU 6+7+12	53
Appraisals	Description	Frequency
AU 1+2	novelty-sudden	138
AU 4+7	novelty-unfamiliar and expectation-discrepant	112
Regulation	Description	Frequency
14+80	dimpler and swallow	102
14+24	dimpler and lip pressing	87
14+53+55	dimpler and head up/tilt left	2
Basic Emotions	Combinations	Frequency
Sadness	AU 1+4+15+17	2
	AU 1+4+15	2
Surprise	AU 1+2+5+26/27	1
	AU 1+2+5	37
Mixed Emotions	Combinations	Frequency
	AU 1+4+12	1

AU 1+4+12+17	1
AU 12+17	8

*of the listed AUs, excluding AU 38

3.6.2 Inter-individual Differences in Smiling

It is an often-cited result of many empirical studies that women smile more than men (see the meta-analysis by LaFrance et al., 2003). The differences are ascribed to role-consistent behavior, for example, that women more often than men try to lighten difficult situations with a smile. In the current sample, the difference between women and men in the number of all kinds of smiles (AU 12 alone or in combination with AU 6 and AU 7) was not significant ($p = 0.052$). However, women smiled more during the reception of *Father and Daughter* (women: $M = 3.00$, $SD = 3.86$; men: $M = 1.79$, $SD = 3.13$). Comparing viewers according to their dominant Modes of Reception also contributed to differences in the overall frequencies of smiles. Female participants with high values on the Mode of Reception *Production* smiled most often (Production: $M = 3.93$, $SD = 4.48$; Identity-Work: $M = 3.76$, $SD = 4.49$; In-Emotion: $M = 2.71$, $SD = 3.70$; Imagination: $M = 2,14$, $SD = 2.41$). Male participants with high values on the Mode of Reception *Identity-Work* smiled most often (Identity-Work: $M = 2.09$, $SD = 3.45$; Production: $M = 1.67$, $SD = 3.04$; In-Emotion: $M = 1.12$, $SD = 2.55$; Imagination: only one case). However, the difference in smiling across all Modes of Reception was not significant.

Therefore, an additional analysis was conducted to elaborate on this further. In most interviews, the making of the film was an issue. Thus, it was possible to determine from the interviews (n = 102) whether the participant liked the formal features of the movie or not. A comparison of the mean values for smiling for these two groups revealed a significant difference: $t(100) = 2.33$, $p < .01$. Those who liked the formal features of the film smiled significantly more often.

3.6.3 Answering the Research Questions

One intention of this study was to answer the question of whether basic emotions can be observed during movie reception, and if yes, to what extent (Research Question 1). Many people would agree that *Father and Daughter* is a sad film. At least the theme of the movie – a loss that cannot be reconciled – and the melodramatic presentation are likely to cause affective reactions belonging to sadness. However, the prototype of the facial expression for sadness (AU 1+4+15+17; FACS manual, p. 174) was coded only two times, and a variant of the sadness expression (without AU 17 – the chin raiser) was coded another two times. The full expression of surprise (AU 1+2+5+26/27) appeared one time. Surprise with a closed mouth (without AU 26/27) was more frequent (37 times). The prototypes of fear and anger were not observed at all. AU 9 (the nose wrinkler) and AU 10 (the upper lip raiser), both of which - alone or in combination with other AUs - indicate disgust, were coded, but they do not belong to the most often coded AUs (see table 1). Happiness was coded quite often. In the FACS emotion predictions, the combination of AU 12 with AU 6 (the cheek raiser) and also AU 12 alone, when reaching intensities higher than B, indicate the

basic emotion *happiness*. AU 6+(7)+12 was coded 200 times, AUs 12C/D/E were coded 96 times.

The movie was not designed to elicit fear or anger. But what does it mean that sadness was so seldom observed? Consider that 134 participants expressed sadness during the entire eight-minute-long movie only 4 times. This is a relative frequency of 0.0037 expressions of the emotion *sadness* per person and per minute. The infrared light in the (darkened) *Cinebox* was reflected by the eyes of the participants when they cried. This allowed for an ad-hoc analysis that revealed at least 24 participants who had tears in their eyes. Tan and Frijda (1999) attributed tears during film viewing to the emotion *sentimentality*. They wrote: "You watch someone else's fortune or misfortune, and suddenly you find yourself crying, without understanding exactly why the precipitating event would touch you so" (p. 49). The reason for such sentiment is in Tan and Frijda's words: "Resistance of the subjects ends because some resolution has been met with" (1999, p. 54).

In fact, the viewers of the short film *Father and Daughter* most often began to cry when a possible solution for the daughter's fate was in sight. Thus, about 20 percent of the sample may have experienced sentimentality. The coded intensities of all facial expressions were mostly slight (2,249 times intensities of A/B compared with 228 times intensities of D/E). In sum, the animated short film *Father and Daughter* was found to inspire sentimentality rather than sadness in a considerable number of viewers. However, the putatively sad movie even more often surprised the viewers and made them happy. Stand-alone AUs of lower intensities or combinations of two AUs could be observed more often than the complex patterns of basic emotions as defined in the FACS.

To advance further research on A-emotions (artifact emotions), the second research question addressed the variables that characterize viewers who smile often. I chose this detour because it seemed impossible to identify film scenes that unequivocally exhibited the filmmaker's formal decisions and eclipsed content at the same time (or vice versa). Scherer and Ellgring (2007) argued that AU 12 (the lip puller) indicates an appraisal of pleasantness and, when combined with AU 6 (the cheek raiser), an appraisal of a filmic event as conducive for entertainment. Female and male viewers who explicitly appreciated how the film was made smiled significantly more often. AU 12 was coded quite often (344 times with a relative frequency of 0.3200 per person and per minute). Actually, AU 12 was the third most often coded AU.

Ekman and Friesen (1982) characterized the combination of AU 6+7+12 as a *felt* smile (also called a *Duchenne* smile: Ekman et al., 1990). The felt smile was coded 53 times for *Father and Daughter*. This finding is in line with the fact that the short film contained at least two scenes that clearly incorporated humorous elements (when the daughter on her bicycle was blown forward by the wind in one scene and when the girl on her bicycle hopped over a stone in another scene; see also Suckfüll, 2010). According to Ekman and Friesen (1982), in so-called *false* smiles, the muscles around the eyes (the orbicularis oculi), responsible for AU 6 and AU 7, are not involved (i.e., in false smiles, only the zygomaticus, the muscles responsible for AU 12, is active). For *Father and Daughter*, 144 AU 12s without activity of the orbicularis oculi were coded and especially those with a low intensity and those that were unilateral (40 times) were spread over the whole film (i.e., they often appeared during film scenes that were absolutely not funny; see also Suckfüll 2017a)

(3).This observation gives reason to be optimistic that the stand-alone AU 12 is a possible indicator for A-emotions elicited by evaluations of the work of art as a man-made artifact. This is in line with the claim, that AU 12 signals happiness in terms of sensory pleasure or amusement (Ekman et al., 1990, p. 347).

Tan postulated that the emotion *interest* is the major F-emotion (fiction emotion). If this is true, the combination of AU 1 (the inner brow raiser) and AU 2 (the outer brow raiser) as an indicator of appraisals of sudden novelty and the combination of AU 4 (the brow lowerer) and AU 7 (the lid tightener) as an indicator of an appraisal of unfamiliarity and unpredictability should be observed frequently (Research Question 3). This was clearly the case: AU 1+2 was coded 138 times during the reception of *Father and Daughter*, and AU 4+7 was coded 112 times. In fact, these were the two highest frequencies of a combination of AUs apart from the combination of AU 6+12 (134 times). Although doubted in film theory, Tan's (1996, 2000) claim that interest is the major F-emotion was supported by the present results. As a matter of course, whether or not interest is an emotion cannot be determined on the basis of the available results. Moreover, it must be acknowledged that the research-based evidence for postulating specific appraisals associated with interest has been relatively small.

The fourth research question addressed mixed emotions. The frequency of overlapping facial expressions that are related to different kinds of affect was determined, and their temporal trajectories were explored. A true overlapping of expressions, a co-occurrence, in which parts of positive emotions on the one hand and negative emotions on the other hand are superimposed, was observed, but very rarely. For example, the overlap of AU 12 and AU 17 (the chin raiser) was observed only eight times. When

looking at these kinds of smiles, the subjective impression (of the coder) is that one is looking at an apologetic or regretful smile.

In the research literature, mixed emotions were recently discussed in the framework of social psychology (Seibt et al., 2017) or as aesthetic experiences in reactions to works of art (e.g., Menninghaus et al., 2015). In these contributions, tears were regarded as an indicator of the mixed emotion *being moved*. In the current paper, however, tears seem to indicate sentimentality. Mixes of emotions in the sense of overlapping facial expressions in the present analyses appear to be mixtures of A-emotions and F-emotions. For example, AU 17 (the chin raiser) may be caused by sad film content and be superimposed on a positive appraisal of the way in which the film scene is stage-managed (indicated by AU 12, the lip corner puller). The reception data for *Father and Daughter* showed that in particular, a scene that was intentionally designed to be ambivalent (e.g., a scene in which a bicycle falls over three times; see also Suckfüll, 2010) caused veritable cascades of facial expressions and resulted in grimaces. Nonetheless the facial expressions had a timeline, that means, they followed from each other; they do not co-occur, but oscillated. According to Norris et al. (2010) oscillation is "the ability to fluctuate between positive and negative stimuli" (p. 8). "When oscillating quickly enough between positivity and negativity, both affects may be activated for an extended period of time, resulting in the experience of a blurred but stable state of coactivation or subjective ambivalence (p. 8)."

In the first instance, it was really astonishing that AU 14 (the dimpler) was the most often coded facial expression (436 times with a relative frequency of 0.4100 per person and per minute). Derived in the light of the numerous theoretical and also

empirical contributions (e.g., Krakowiak & Oliver, 2012; Eden et al., 2016) to morality in cinema and on TV, the last research question addressed the frequency of appraisals of violated internal standards and the role the moral emotion *contempt* might play. In the research literature, a particular facial expression – the unilateral AU 14, which often co-occurs with a slight head raise and tilt – has been reported to be an indicator of contempt.

Of 436 AU 14s, 110 were unilateral: 64 appeared on the right side of the mouth, and 46 appeared on the left side. More than one third of these unilateral AU 14s were reactions to scenes in the movie in which the inner conflict of the daughter was intensified by repeatedly showing the daughter returning to the place on the shore from where her father left. Keeping in mind the manifold objects for appraisals, these scenes may have caused a negative appraisal because 1) the viewer disapproved of the father who left his little daughter behind, 2) the viewer may have rejected the iterative (and as such boring) showing of the daughter's futile attempts to deal with the loss of her father, or 3) a viewer may have condemned the female martyr figure, which is so typical of melodrama. 4) The unilateral AU 14 may also indicate a negative appraisal of the filmmaker's attempt to exert an influence. A viewer may think: "Ok, I've got it! It is not necessary to show me how she is suffering again and again." And finally, 5) a person might re-evaluate her or his own emotions ("Ah, why do I feel for an animated figure?").

In any case, the unilateral AU 14 represents a viewer who in some way *distances* her- or himself. The object of the disapproval, withdrawal, or rejection cannot be identified without further investigation, for example, via interviews. The moral emotion *contempt* may be elicited in only a few instances because the object of the negative appraisal in many cases is not

an “immoral” content feature. Contempt indicates that one feels superior to someone. In the data at hand, head movements accompanied the unilateral AU 14 in only two cases (AU 14+53+55/56). Instead, AU 14 (bilateral and unilateral) appeared most often in combination with swallowing (AU 14+80: 102 times). William James (1884) noted: “When momentarily embarrassed, it is something in the pharynx that compels either a swallow, a clearing of the throat, or a slight cough; and so on for as many more instances as might be named (p. 193).” However, to my knowledge, swallowing has not yet been comprehensively discussed as a covariate of particular emotions (possibly of regret or of being moved).

AU 14 was also often combined with AU 24 (the lip presser; AU 14+24: 87 times). Bleuel and Suckfüll (2011) identified AU 24 as a covariate of the emotion regulation strategy *suppression* in film viewing (see also Suckfüll, 2013). In sum, many bilateral AU 14s are covariates of swallowing and emotion regulation. Unilateral AU 14s represent a momentary distancing from or rejection of elements of movies that can be related not only to the content but also to the form or the broad area of the production of the movie.

4. Discussion

4.1 Implications

The results of the exploratory study reported here can provide some interesting insights for ongoing theoretical modeling as well as empirical research on emotions elicited by movies. Three implications of the results should be highlighted:

1) Regulation and distancing are essential components of emotional processes in movie reception. When watching movies,

in the basically safe reception situation, the viewers can organize their reception in a way that is mostly free of behavioral constraints. Their unceasing control over the situation allows them to deal with demanding and unexpected content and thus with strong emotions. The viewers practice a “controlled loss of control” (Suckfüll, 2013, p. 317). To be able to regain control via emotion regulation and distancing every time during the reception process is a sine qua non for entertainment, which is the main motivation to watch movies.

2) The empirical evidence supports the claim that formal features can actually elicit appraisals and thus trigger positive affective reactions such as sensory pleasure or amusement in the viewers. These positive kinds of affect can influence ongoing information processing. For example, Fredrickson and Levenson (1998) showed that positive emotions speed up the recovery from negative emotions. This also enables viewers to down-regulate negative emotions and thus to regain control over the situation.

3) In movie reception, mixed emotions to a considerable extent can be interpreted as reactions to content features of a movie on the one hand and to formal features on the other hand and at the same time. Subjective ambivalence is often rooted in oscillations or fluctuations between positive and negative emotional experiences triggered by the intentionally designed work of art.

4.2 Limitation

The main limitation of the present description of frequencies of facial expressions observed in viewers of an animated short film is the fact that the results up to now could not be generalized for other movies. The animated short film *Father and Daughter* is a special case. First, the music plays an important role in this little movie. However, this might not be an

essential problem for the interpretation of the present results because music in concert with content and form in many movies contributes to the elicitation of emotions. In *Father and Daughter*, which is a 'silent' movie (there is no speech), the faces of the minimalistically drawn characters do not allow for the elicitation of emotions by the interpretation and perhaps imitation of the characters' facial expressions (Scherer, 1998), which are important sources of emotions in most movies (4). It is also true that, in the first place, the emotion-eliciting events in *Father and Daughter* stem from the narrative structure, and this was one of the reasons why I chose the movie for the study. Emotional effects resulting from (more or less famous) actresses and actors, their (more or less impressive) acting performances, and their verbal interactions were not examined in the present contribution. However, the viewers empathized with the animated characters. For example, participants who mentioned that they had lost their own father clearly exhibited stronger reactions to the movie. Also, participants who were responsible for children mentioned that they were really touched by the little movie. Thus, even in case of an animated short film, expressed sadness could have been expected. One may argue that *Father and Daughter* is a movie that intentionally cues emotions linked to interest and distancing because the movie contains small breaks (views of a landscape in different seasons), and the main protagonist (the daughter) was unable to enact real goal-directed actions. However, there are many movies that avowedly block immersion through plaited information gaps. And, the intention of such movies is explicitly to intensify the cinematic experience (Suckfüll, 2016; 2017b).

At least one result of the present descriptions is in line with other research in which the facial expressions of viewers were

coded in detail. In these studies, AU 14 was also the most frequently observed facial expression (for movies: Unz et al., 2008; for TV news: Unz et al., 2008; see also Suckfüll & Unz, 2016). However, without a doubt, the results for *Father and Daughter* await replication in further studies with other movies as well as systematic variation and comparison in experimental studies.

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Notes:

1. Goal conduciveness in the context of movie reception means that the viewer evaluates a feature of a movie as conducive for an entertaining experience.

2. More recently, there has been a tendency to define different positive emotions caused by media entertainment (e.g., Oliver & Bartsch, 2011; Oliver & Raney, 2011).

3. Ekman and Friesen (1982) defined a third category of smiles, the *miserable* smiles, "which acknowledge a willingness to endure an unpleasant circumstance" (Ekman, Davidson, and Friesen, 1990, p. 343). The difference is that in the case of a false smile, a person attempts to appear as if a positive emotion is felt, and in the case of a miserable smile, the person acknowledges feeling unhappy. Miserable smiles often quickly follow a

negative emotional expression. Thus, the miserable smile can also be interpreted as a re-appraisal of felt emotions.

4. Bálint (2015) developed different versions of the film *Father and Daughter* by implementing professionally drawn scenes in which the focus was on the face of the daughter (for *Father and Daughter*, see also Forceville & Jeulink, 2011; Bateman, 2014).

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