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Can people really “laugh at themselves?” Experimental and correlational evidence

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## Abstract

Laughing at oneself is considered a core component of the sense of humor in the theories of several authors. In McGhee's (1996) eight-step-training program of the sense of humor, laughing at oneself constitutes one of the most difficult levels. However, until now, only little empirical evidence on laughing at oneself exists. Using a multi-method approach, in the current study, 70 psychology students and a total of 126 peers filled in the *Sense of Humor Scale* (SHS, McGhee, 1996), containing as a subscale "Laughing at oneself". In addition, the participants answered the Trait and State forms of the *State-Trait-Cheerfulness-Inventory* (STCI, Ruch, Köhler, & van Thriel, 1996, 1997). They then were confronted with six distorted images of themselves. Facial responses of the participants were videotaped and analyzed using the *Facial Action Coding System* (FACS, Ekman, Friesen, & Hager, 2002). Four indicators of exhilaration were examined: experienced funniness, AU12 smiles, Duchenne displays, and laughter. Furthermore, fake and masking smiles were studied. Results demonstrated that self- and peer reports of "laughing at oneself" converged moderately. All four indicators of exhilaration were shown, but funniness and laughter seemed to be the most strongly related indicators. Trait cheerfulness and (low) seriousness, and a cheerful mood state formed further characteristics of persons who laugh at themselves.

*Keywords:* Laughing at oneself; distorted portraits; Duchenne display; sense of humor; cheerfulness

## Introduction

While the sense of humor incorporates facets like humor production and humor temperament (Ruch, 2004), several authors have argued that a core component of humor is the ability to laugh at oneself (e.g., Lersch, 1962). Yet, to this day, despite the increasing attention to this personality construct (cf. Martin, 2007; Ruch, 2007), no authoritative definition of the sense of humor exists. There are several studies on smiling and laughing as a response to humor stimuli (cf. Ruch, 2005). But it is not yet clear what “laughing at oneself” is, or if it even actually occurs in people’s everyday behavior.

### *Laughter and “Laughing at oneself”: Theoretical Claims and Empirical Evidence*

The concept of “laughing at oneself” has not been thoroughly examined. Some have even argued against its existence because in their view humor derives from a feeling of superiority (e.g., Gruner, 1997; La Fave, Haddad, & Maesen, 1996). La Fave et al. (1996), for example, considered “laughing at oneself” a “myopic illusion“ (p. 79). They reasoned that a mishap at one’s own expense couldn’t be a happy event. Thus, laughter when considering one’s own follies could more likely be explained by self-hatred, masochism, or separation of the amused part of the self from the “butt part” (p. 82).

In contrast to the latter position, the ability to “laugh at oneself” is often considered a core component of the sense of humor (e.g., Roberts, 1988; Lersch, 1962). Lersch considered the inability to laugh at oneself and the tendency to take oneself too seriously indicators for “humorlessness”. For McGhee (1979, 1996), whose Sense of Humor Scale (SHS, McGhee, 1996) is the only existing questionnaire containing a subscale that measures “laughing at oneself,” humor was a form of play (see also McGhee, Ruch, Rusch, Stolz, & Beermann, 2009; Proyer, Ruch, & Müller, 2010). In his eight-step training program of the sense of humor (McGhee, 1996), taking oneself lightly and laughing at oneself constituted one of the most difficult levels of the sense of humor. Among other things, taking oneself lightly meant seeing

the funny side of one's own circumstances or behavior. But he also emphasized that laughing at oneself didn't mean put-down humor, but rather a confident acceptance of problems or weaknesses that one cannot change.

Nevo (1985) studied laughing at one's own expense in Jewish and Arab participants. In one part of the study, they were asked to complete conversations between Jews and Arabs in cartoon-like drawings in a humorous way. Participants aimed 11.3% of the humorous remarks at their own group, which for Nevo was an evidence for self-targeting humor. However, humor aimed at one's group still might be different from laughing at oneself (cf. Davies, 1991, 2002).

Ruch and Carrell's (1998) study involved laughing at oneself as an individual. Using McGhee's (1996) scale, they studied the relation of humor skills to what is considered the temperamental basis of humor: cheerfulness, seriousness, and bad mood (cf. Ruch, Köhler, & van Thriel, 1996, 1997). Trait cheerfulness was strongly correlated to laughing at oneself ( $r = .52$ ). Furthermore, some facets of (low) trait seriousness predicted laughing at oneself. In several studies, traits and states of cheerfulness have been found to be positively related, and traits and states of seriousness and bad mood are negatively related both to the sense of humor (e.g., Köhler & Ruch, 1996; Ruch & Carrell, 1998) and to facial enjoyment displays (e.g., Ruch, 1997). Until now, however, no experimental approach has been attempted to study the phenomenon of "laughing at oneself". It is thus not at all clear what "laughing at oneself" looks like behaviorally.

#### *Exhilaration, Smiling, and Laughter, and Their Measurement*

Ruch (1990) suggested that the emotion that is evoked by humor is exhilaration<sup>1</sup>. It is observable in physiology, emotional experience, and behavior. While the experience of exhilaration can be assessed reliably by self-report, behaviorally, it is best measured by analyses of smiling and laughter (e.g., Ruch, 1990, 1993, 1997). Smiling and laughter have

been described widely (e.g., Bachorowski, Smoski, & Owren, 2001; Bänninger-Huber, 1996; Ekman, 1985; Habermann, 1955; Provine, 2000; Ruch & Ekman, 2001). It needs to be noted that there are often smooth transitions between smiling and laughter (e.g., Ruch, 1990).

Importantly, it is possible to identify genuine types of smiling and laughter (i.e., those types associated with genuine enjoyment rather than those broadcasting enjoyment not actually felt) on the basis of facial expressions. This is important as failing to do so has often led to distorted results in former studies (cf. Ruch, 1997). The crucial marker of genuine enjoyment is the *Duchenne display* (Ekman, Davidson, & Friesen, 1990). The Duchenne display refers to a contraction of the *zygomatic major* (pulling the lip corners backwards and upwards) and the *orbicularis oculi, pars orbitalis*, muscles (raising the cheeks causing eye wrinkles). Symmetry of the facial actions is another marker for spontaneous and genuine facial expressions.

The acoustics of laughter are highly complex and variable, influenced by several factors like speech, gender, or the relationship to the social partner (e.g., Bachorowski et al., 2001). Laughter is, however, accompanied by a characteristic respiration pattern consisting of a forced initial exhalation and possibly a sequence of repeated expirations, which may or may not be vocalized, and which are audible and possibly visible (cf. Ruch & Ekman, 2001). The most useful way to identify genuine laughter, thus, is the Duchenne display, which is accompanied by a single or multiple forced expirations (Ruch, 1997; Ruch & Ekman, 2001; Zweyer, Velker, & Ruch, 2004).

The *Facial Action Coding System* (FACS, Ekman, Friesen, & Hager, 2002) is a comprehensive coding system describing 44 minimal facial movements—so-called action units (AUs)—based on the muscular anatomy of the face. To code an AU, several criteria of facial changes have to be fulfilled, so that FACS is an objective and highly reliable coding system able to “distinguish all possible visually distinguishable facial movements” (Ekman et al., 2002, p. 2). While Ruch (1990) found that FACS and a physiological measure such as

Electromyography (EMG) are both equally able to identify facial displays of smiling and laughter, FACS coding has the advantage of being implementable without the knowledge of the participants (and thus without influencing their facial expression). This was a crucial condition for the current study.

FACS has proven to be useful in humor research as it is capable of differentiating genuine and fake types of smiling. Using FACS up to 18 types of smiles can be classified (cf. Bänninger-Huber, 1996; Ekman, 1985), most of which are *not* smiles of enjoyment. Enjoyment displays are expressed with the Duchenne display mentioned above and coded as an AU12 (zygomatic major) accompanied by AU6 (orbicularis oculi, pars orbitalis).

Ruch (1990) found that different levels of exhilaration influence the threshold for its expression. He was able to show that the experience of exhilaration (assessed by verbal reports) is induced the easiest. This is followed by an expression of AU12, then by the joint action of AU12 and AU6, and then by actual laughter.

#### *What are the Behavioral Signs of Laughing at Oneself?*

Experimental settings that are able to provoke laughing at oneself may also provoke negative responses—especially in individuals who *don't* or *cannot* laugh at themselves. Furthermore, accepting one's problems, embarrassing experiences or weaknesses, or disliked features might still imply negative feelings about them. This could result in facial expressions of negative or mixed emotions. Smiles of people who are not able to laugh at themselves could be accompanied by signs of contempt or annoyance, or may be faked.

As McGhee (1996) puts it, laughing at oneself should help mastering these emotions by being able to heartily laugh at them. Thus, even if negative emotions occur, they should be alternated by positive emotions or genuine enjoyment and exhilaration, unencumbered by negative emotions. The term “hearty laughter” is intended to imply that exhilaration is elicited. But it is not yet clear whether observable *laughter* will be shown, or merely *smiling*

and finding an own image *funny*, or if it only means the mere absence of negative emotions at the sight of distorted images of oneself.

### *The Present Study*

The current study addressed the phenomenon of laughing at oneself using a multi-method approach: (a) self-report, (b) peer-report, and, in an experimental setting, (c) behavioral responses to stimuli which might provoke laughter at oneself. The participants were surprisingly confronted by distorted portraits of themselves. Thus they were put in a situation where both negative and positive responses were possible, including smiling or laughing at themselves. As a comparison, distorted portraits of two strangers were used. Participants' emotional responses were assessed through funniness and aversion ratings and video analyses of their facial expression by means of a hidden camera.

Aims of the study were firstly to investigate the convergent validity among methods in the form of a positive relationship among self- and peer-reports of laughing at oneself and behavioral responses—i.e., verbal and facial signs of exhilaration were expected for people who endorse laughing at oneself in a questionnaire or are described to do so by their peers. In the current study, four indicators of exhilaration behavior were examined. The first one was laughing (i.e., the Duchenne display, accompanied by forced exhalation of air), which was expected if *laughing* at oneself can indeed be understood literally. The second one was smiling in a genuine way (i.e., the Duchenne display) as an expression of enjoyment at the sight of the distorted portraits. As a third indicator, genuine AU12 with or without AU6 (i.e., symmetrical and not accompanied by negative emotions) were examined. And lastly, reported funniness at the sight of the distorted portraits was studied. In contrast to this, fake or masking smiles, i.e., AU12 that is asymmetric or accompanied by AUs indicating negative emotions, were analyzed and expected to be negatively related to laughing at oneself in the SHS.

Secondly, it seemed important to include more measurements assessing temperamental traits that have repeatedly been found to be related to the sense of humor, laughing, and smiling. Thus, as an additional evidence of validity, relations to the temperamental basis of humor—i.e., cheerfulness, seriousness, and bad mood was investigated. According to the study of Ruch and Carrell (1998), it was expected that cheerfulness would be related positively to self- and peer-reported laughing at oneself as well as facial expressions of exhilaration in the experiment. Furthermore, as mood states influence the induction of exhilaration and the threshold for smiling and laughter (e.g., Ruch, 1993, 2005; Ruch et al., 1997), cheerfulness, seriousness, and bad mood were also included as states.

Finally, an unobtrusive measure was studied. Participants had to fill out an agreement form at the end of the experiment that involved video recordings. The obvious purpose of the agreement form was to document the permission for the usage of the video and photo material, ranging from having the material deleted on the spot to allowing its use in television documentaries. The degree of this readiness to have one's material exposed to a wider audience might also be related to the tendency of laughing at oneself.

## Method

### *Participants*

The sample consisted of 70 psychology students (48 females, 22 males) between the ages of 19 and 65 years ( $M = 25.49$ ,  $SD = 7.93$ ), who were recruited in undergraduate psychology classes and via a mailing list for, as they were told, a study on “humor and personality”. The actual aim of the study, i.e., the focus on “laughing at oneself”, was not revealed. Each participant was to ask one to two peers to fill in the peer reports of the SHS. In total, 122 peers (72 females, 48 males, 2 n.n.) between the ages of 18 and 72 years ( $M = 31.78$ ,  $SD = 13.80$ ) were recruited, but two participants did not provide peer ratings. In return for participation, personalized feedback on the results of the questionnaires was

provided by request. In three cases, a camera failure occurred, so that the video material of 67 participants (45 females, 22 males) ended up being usable for the facial analyses.

### *Instruments*

The *Sense of Humor Scale* (SHS, McGhee, 1996) is a 40-item questionnaire with a 4-point answering format (1 = “strongly disagree”; 4 = “strongly agree”). It is aimed at measuring the foundation of the sense of humor (according to McGhee) with eight subscales each of which contains five items. For the current paper, only the subscale SHS-7 (laughing at oneself) was analyzed. An example for an item of this scale is “I have no trouble poking fun at certain physical qualities of myself.” In addition, a peer questionnaire form was generated by rephrasing the items from a first person to a third person version and adapting the instructions accordingly. The Cronbach’s  $\alpha$  coefficients were .86 for the self-report scale and .82 for the peer-report scale.

The *State-Trait-Cheerfulness-Inventory* (STCI, Ruch et al., 1996, 1997, see also Carretero-Dios, Eid, & Ruch, in press, for new data on the validity of the instrument) assesses *cheerfulness*, *seriousness*, and *bad mood* as habitual traits and as actual states with a four-point answer format from 1 = “strongly disagree” to 4 = “strongly agree”. The standard trait form STCI-T<60> contains 60 items (20 items for each dimension). The instructions aim at moods and mentality *in general*. Item examples for the trait version are “I am a cheerful person” (trait cheerfulness), “In my life, I like to have everything correct” (trait seriousness) and “Compared to others, I really can be grumpy and grouchy” (trait bad mood). The reliabilities (Cronbach’s  $\alpha$ ) of the scales were .91, .73 and .95, respectively. The standard state form STCI-S<30> consists of 30 items (10 items for each dimension). The instruction addresses the mood state *at this moment*. Item examples are “I feel merry” (state cheerfulness), “I am in a thoughtful mood” (state seriousness) and “My mood is spoiled”

(state bad mood). The scales yielded Cronbach's  $\alpha$  coefficients between .85 (state seriousness, t1) and .94 (state cheerfulness, t2).

The *Agreement Form* asks for the permission, to different degrees, of usage of the video and photo material (in anonymized form) recorded during the experiment. The five degrees are 1 = "The material has to be deleted on the spot", 2 = "The material may be analyzed in the context of the current study", 3 = "The material may be analyzed and archived and may be used for future research purposes (e.g., training of experimenters)", 4 = "The material may be analyzed and archived and may be used for future research and teaching purposes (it may be shown to students)", 5 = "The material may be analyzed and archived and may be used for future research, teaching and publication or documentation purposes (e.g., television documentaries)".

*Confrontation with Distorted Images of the Participants' Faces: The Distorted Portrait Judgment Task*

The *Distorted Portrait Judgment Task* (DPJT) aims at measuring verbal and facial indicators of exhilaration at the sight of distorted portraits of oneself and two strangers. It consists of 18 distorted images of faces, i.e., of a set of 18 *Distorted Portraits*. There are six distorted portraits of a woman's face (i.e., a subset of *Distorted Portraits of Woman*), six distorted portraits of a man's face (i.e., a subset of *Distorted Portraits of Man*, resulting in a subset of 12 *Distorted Portraits of Strangers*), and six distorted portraits of the participant's face itself (i.e., a subset of *Distorted Portraits of Oneself*). The distorted portraits are integrated into a computer presentation and have to be rated for funniness (1 = "not funny", 7 = "very funny") and aversion (1 = "not aversive", 7 = "very aversive") on an answer sheet in paper-and-pencil format. The Cronbach's  $\alpha$  for the Distorted Portraits of Oneself were .76 for funniness and .87 for aversion. For the Distorted Portraits of Strangers, the  $\alpha$  coefficients were .84 (funniness) and .92 (aversion).

All distorted portraits were created using a web cam and the program “Photo Booth” which is part of Mac OS X. For each distorted portrait within one subset, a different distortion effect (e.g., stretch, twirl) was chosen. The subset of Distorted Portraits of Strangers was already inserted within the DPJT computer presentation before the experiment. The production of the Distorted Portraits of Oneself and their insertion into the computer presentation took place at the beginning of the experiment, while participants filled in a questionnaire. Each distorted portrait was on a single slide and a sound signaled each slide transition. The distorted portraits of the three subsets (Distorted Portraits of Men, Distorted Portraits of Woman, Distorted Portraits of Oneself) were in a counterbalanced order with respect to the distortion effect and the position of the images of the Distorted Portraits of Man and Distorted Portrait of Woman. A parallel version with a mirrored sequence of the distorted portraits was developed, so that in total two versions existed. Images from the Distorted Portraits of Oneself were in the same positions in both versions, and both versions started with an image from the Distorted Portraits of Oneself. Figure 1 shows illustrative examples of the subset Distorted Portraits of Oneself.

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Insert Figure 1 about here

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Figure 1 shows the distortion effects that were used for the distorted portraits. Furthermore, the position of the images from the Distorted Portraits of Oneself among all 18 portraits is indicated. Mean scores for funniness and for aversion of Distorted Portraits of Oneself (PorO f, PorO a) and Distorted Portraits of Strangers (PorS f, PorS a) were derived.

#### *Facial Measurement*

The *Facial Action Coding System* (FACS, Ekman et al., 2002) was used as method for measuring facial parameters of enjoyment and other facial reactions to the distorted images. All AUs were coded for frequency, intensity (on a 5-point scale ranging from 1 = “trace” to 5

= “maximum”, corresponding to the FACS A to E scale) and symmetry. However, analyses focused on AU12 and AU6+12 (the Duchenne display). These AUs could possibly be accompanied by AU7 (lids tight), AU25 (lips part), AU26 (jaw drop), and AU27 (mouth stretch). Negative emotions must not occur simultaneously for a Duchenne display. Additionally, laughing was defined by coding forced exhalation of air accompanying AU6+12. Furthermore, “instruction” (for reading the instruction) and “writing” (for performing the ratings on the sheet of paper) were defined as coding units. “Picture” was an additional coding unit coded with every “beep” sound that indicated a change of picture on the participant’s screen. Head and eye movements related to these activities were not coded separately. The coding was performed by two certified FACS-coders using the software “Observer” by Noldus. The facial reactions of five participants were coded by both coders to determine the reliability and the resulting coefficient was .93.

For analyses of AU12 as well as AU6+12, the occurrence and intensity for Distorted Portraits of Oneself and the Distorted Portraits of Strangers were analyzed. AU12 included all AU12 with or without AU6; however, AU12 and AU6+12 were only taken into account when they were not asymmetric or accompanied by AUs indicating negative emotions, such as AU4 (brow lowerer), AU10 (upper lip raiser), AU11 (nasolabial furrow deepener), AU14 (dimpler), AU15 (lip corner depressor), AU20 (lip stretch), or AU24 (lip presser). *Occurrence* of AU12 and AU6+12 was an index reflecting whether the respective AUs were (= 1) or were not (= 0) displayed at least once per portrait. This resulted in four scores: the averaged occurrence of AU12 when watching Distorted Portraits of Oneself (PorO 12 Occ.), of AU6+12 when watching Distorted Portraits of Oneself (PorO 6+12 Occ.), of AU12 when watching with Distorted Portraits of Strangers (PorS 12 Occ.), and of AU6+12 when watching Distorted Portraits of Strangers (PorS 6+12 Occ.). Likewise, four scores each were built for intensity. For *intensity* scores, the averaged intensities during the apexes were taken. That is, the apex intensity of AU12 and of AU6+12 per portrait was averaged across the Distorted

Portraits of Oneself (PorO 12 Int., PorO 6+12 Int.) and the Distorted Portraits of Strangers (PorS 12 Int., PorS 6+12 Int.).

For laughter, the *frequency* was defined by the total number of a series of single or multiple expulsion of air (accompanying AU6+12) per portrait. This resulted in frequency of laughter in response to Distorted Portraits of Oneself (PorO laugh fr.) and frequency of laughter in response to Distorted Portraits of Strangers (PorS laugh fr.).

### *Procedure*

The participants were unaware of the specific aim of the study (i.e., laughing at oneself) but were instructed that they were participating in a study on humor and personality. As they filled in some humor instruments the attention was directed to the questionnaires. None of the participants assumed they were videotaped. They were mailed the paper-and-pencil versions of the STCI-T, and the SHS, and filled them in at home. The peers answered the SHS Form Peer only. They were instructed to return their questionnaires directly to the Department of Psychology to ensure their anonymity towards those whom they answered the SHS Form Peer for. In addition, the participants were invited to an experimental part at the Department of Psychology for a single testing session during which they also handed in their questionnaires.

The experimental part consisted of the production of the Distorted Portraits of Oneself, the STCI-S<30>, and the Distorted Portrait Judgment Task (DPJT). For the DPJT, the participants sat in front of a computer. Answer sheets for the ratings were in paper-and-pencil format. Each parallel version of the distorted portraits in the DPJT was answered by half of the participants to counteract sequence effects. For the assessment of mood states, the participants sat at another desk and answered the paper-and-pencil version of the STCI-S before and after the task. The experimental part lasted approximately 20-30 minutes.

As a cover story when producing the Distorted Portraits of Oneself for the DPJT, participants were told that the photos were “made for an additional study evaluating

physiognomy hypotheses” and did not know of the distortion. The portraits were inserted into the DPJT computer presentation without the participants’ awareness while they filled in the STCI-S for the first time. They received instructions by the DPJT computer presentation to rate the photographs they were going to see. However, they were *not* informed that they would see distorted portraits, and that some of them would show themselves.

During the whole procedure, a hidden camera recorded their face. At the end of the experiment, the participants were debriefed and informed of the actual goal of the study and that they have been secretly videotaped. They filled in the *Agreement Form* in which they were offered to see the video material deleted in front of their eyes. None of the participants took up the offer.

### Results

In a first step, the means, standard deviations, skewness, and kurtosis for each variable for the questionnaire scales and Distorted Portraits ratings were analyzed. The two peer-reports were averaged and these scores were used for all analyses. When a participant had only one peer report (14 cases), this single measure was used. Furthermore, as gender effects on sense of humor, humorous temperament, as well as on facial display of smiling and laughter have been discussed (e.g., Ruch & Carrell, 1998; Martin, 2007), correlations with gender were analyzed. The means, standard deviations, skewness, kurtosis, and correlations with gender are presented in Table 1.

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Insert Table 1 about here

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Compared to data in former studies, all means were within a range of +/- one standard deviation of the means found in the those studies (see Table 1). One of the facial indicators of enjoyment deviated from normal distribution rather strongly, namely frequency of laughter when confronted with Distorted Portraits of Oneself. Following recommendations by

Tabachnick and Fidell (2007), the variable was transformed by using a square root transformation in order to counteract distortion of the results in the analyses. The transformation resulted in skewness and kurtosis values  $< 2.56$  and the variable was thus assumed as adjusted to normal distribution. In all following analyses the transformed variable was used.

Females were habitually more cheerful and had slightly lower states of seriousness compared to males. However peers described them to be slightly less able to laugh at themselves than males, and they showed Duchenne display slightly less frequently at the sight of their own portraits.

#### *Laughing at Oneself within the Experiment: Facial Enjoyment*

The task proved useful in inducing exhilaration in the participants. Frequency analyses showed that in total, 63 out of 67 participants (94.03%) responded with at least one AU12 to the Distorted Portraits of Oneself. At least one Duchenne display (i.e., AU6+12) was shown by 53 (79.10%) participants. Furthermore, 27 participants (40.29%) laughed at least once. Regarding the Distorted Portraits of Strangers, 59 participants (88.06%) displayed at least one AU12, and 40 participants (59.70%) had at least one Duchenne display. In 15 cases (22.38%), laughter was shown at least once.

#### *Laughing at Oneself: Convergence Between Different Methods*

In order to determine convergence between different methods of measuring laughing at oneself, partial Pearson correlations were calculated between self- and peer-reports of laughing at oneself, facial and verbal responses to the Distorted Portraits of Oneself and of strangers, as well as with trait and state cheerfulness, seriousness, and bad mood. Because of the slight gender effects reported above and in Table 1, gender was controlled for in the calculations. The results are shown in Table 2.

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Insert Table 2 about here

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Table 2 shows that self- and peer-reports of laughing at oneself converged moderately. Furthermore, people who reported to laugh at themselves or were described to do so by peers showed enjoyment in their experience (verbal responses) and their behavior (facial responses) within the experiment. Moreover, correlations to traits and states of the temperamental basis of humor could be shown. The results are described in more detail in the following sections.

### *Laughing*

One aim of the study was to investigate which indicators of exhilaration are shown in the behavior of the participants when looking at their own pictures. Laughing at oneself, when understood in its strictest sense, should involve Duchenne display accompanied by single or multiple forced exhalations.

Table 2 indicates that the more people reported to laugh at themselves, the more they showed laughter (*frequency*) when confronted with the Distorted Portraits of Oneself. For those whose peers described them with higher scores in laughing at oneself (SHS-7), the correlations were even higher. In contrast to that, there was no significant correlation between frequency of laughter as a response to Distorted Portraits of Strangers and self- and peer-report of laughing at oneself.

In order to find out whether the proportion to which exhilaration is expressed by laughing rather than smiling was more distinctive for laughing at oneself rather than *all* distorted images, a *laughing quotient* was built by dividing the frequency of laughing by the frequency of Duchenne display (for those participants with a frequency of laughing greater than 0 only). This was done for the Distorted Portraits of Oneself ( $n = 53$ ) as well as for the Distorted Portraits of Strangers ( $n = 40$ ). Correlations suggested that the higher the laughing quotient was for Distorted Portraits of Oneself, the higher were their self- and their peer-rated

laughing at oneself scores within the SHS (McGhee, 1996), each with approximately 9% of overlapping variance ( $r^2$ ). There were no meaningful correlations between the laughing quotient and self-reported laughing at oneself and peer-reported laughing at oneself for the Distorted Portraits of Strangers.

### *Smiling*

Those participants who described themselves as laughing at themselves showed more (*occurrence*) and more intense (*intensity*) AU12 and AU6+12 when looking at the Distorted Portraits of Oneself (see Table 2). In contrast to laughing, the occurrences of smiling reaction (AU12 alone, AU6+12) as well as intensity of the smiling reaction (AU6+12) as a response to the Distorted Portraits of Strangers were also related to self-reported laughing at oneself.

Furthermore, the differentiation of genuine and false kinds of smiles proved to be important. Correlations with AU12 were only found when they were symmetric and not associated with AUs indicating negative emotions. Fake or blended AU12 when watching Distorted Portraits of Oneself, i.e., AU12 accompanied by negative emotions or asymmetric AU12, were *negatively* related to self-reported laughing at oneself. There were no correlations regarding peer-reports. Neither were there correlations between self- nor peer-reports for fake AU12 when watching Distorted Portraits of Strangers.

### *Verbal responses*

Participants who reported to laugh at themselves within the SHS (McGhee, 1996) also found the Distorted Portraits of Oneself funny (see Table 2). However, they also rated the Distorted Portraits of Strangers as funny, albeit with a lower coefficient. Furthermore, participants whose self- and peer-reported laughing at oneself scores were low found the Distorted Portraits of Strangers aversive.

The funniness ratings and facial signs of enjoyment (correlated across the 18 stimuli, cf. Ruch, 1997) were moderately related. They resulted in  $r = .62$  ( $p < .01$ ) for frequency,  $r = .58$

( $p < .05$ ) for intensity of Duchenne smiles and  $r = .37$  ( $p = .13$ ) for frequency of laughter, failing to be significant for the latter because of the low  $N$  (18 stimuli).

*Laughing at Oneself and Other Indicators of the Sense of Humor: Humor Temperament and Mood States*

In general, those who reported to laugh more at themselves, were the more habitually cheerful people. Those participants who were described to laugh at themselves by their peers were less habitually serious (see Table 2). Similar results were shown concerning verbal and facial responses to the Distorted Portraits within the experiment. Trait cheerfulness predicted in particular occurrence and intensity of smiling reactions, with the highest relation for occurrence of AU12 when confronted with Distorted Portraits of Oneself. Trait bad mood was consistently negatively related (however, not all at a significant level), also with the highest relation between occurrence of AU12 when judging the Distorted Portraits of Oneself.

In general, people who had higher scores in laughing at oneself also were likely to be more cheerful, less serious, and in a better mood state both prior to and following the DPJT. Furthermore, higher states of cheerfulness and lower states of seriousness and bad mood were related with higher funniness of the Distorted Portraits of Oneself, which in turn correlated with higher states of cheerfulness and lower states of seriousness and bad mood *after* the task. Likewise, participants who showed AU12 and AU12+6 in response to the Distorted Portraits of Oneself and AU12 in response to Distorted Portraits of Strangers more often and more intensely displayed higher states of cheerfulness after the task. Those who displayed AU12 and AU12+6 in response to the Distorted Portraits of Oneself often and intensely also had low states of seriousness and bad mood subsequent to the task.

Furthermore, a difference score was built by subtracting facial indicators of enjoyment in response to Distorted Portraits of Oneself from facial indicators of enjoyment in response to Distorted Portraits of Strangers. A positive score indicated that a participant found the

Distorted Portraits of Oneself funnier than the Distorted Portraits of Stranger, whereas a negative score means that a participant found the Distorted Portraits of Strangers funnier than those of themselves. Correlations revealed that showing Duchenne display *more often* and *more intensely* in response to *own* distorted portraits as compared to *strangers'* ones (i.e., a higher difference score) contributed more to enhancement of state cheerfulness,  $r = .39$ ,  $p < .001$  both for *occurrence* and for *intensity* of Duchenne display.

Moreover, the Agreement Form was related to the self-report of laughing at oneself. Participants who reported to laugh at themselves to a higher extent also were more likely ready to have their video- and photo material exposed to a wider range of people ( $r = .20$ ,  $p = .05$ , one-tailed).

### Discussion

The present study is the first to use a multi-method approach to the phenomenon of “laughing at oneself.” Questionnaire measures were used as self- and as peer-reports. Furthermore, by means of distorted images of them, participants were put into a situation where they were provoked to laugh at themselves. Four indicators of exhilaration were examined to determine the behavior that is shown when laughing at oneself. Smiles that do not reflect felt enjoyment were also studied.

#### *Convergence Among Methods*

Laughing at oneself was measured by self-report, by peer-report, and by observation of behavioral responses to experimental stimuli. All methods converged moderately. Among the exhilaration behaviors, all four indicators of exhilaration were shown more strongly/frequently by people who reported to laugh at themselves. Furthermore, funniness ratings were substantially related to facial displays of enjoyment. Experiencing funniness when seeing the distorted portraits, laughing, and especially the proportion of laughter within all exhilaration displays were behavioral responses related strongest to claiming to laugh at

oneself in the questionnaire. Participants also smiled more often and intensely at the distorted portraits showing themselves when they endorsed laughing at oneself in the questionnaire.

While participants who reported to laugh at themselves also smiled at Distorted Portraits of Strangers and found them funny, *laughing* at Distorted Portraits of Strangers did go along *neither* with self- *nor* peer-reported laughing at oneself. Also, finding one's own images funnier than images of others added more to enhancement of state cheerfulness than the other way round. The question arises why self-reported laughing at oneself predicts smiling at the images of strangers. One interpretation could be the following: If people can smile at the sight of their own images, they know that although the images are targeting their own person, they are innocent jokes—perhaps a prerequisite for laughing at oneself. But the same applies to the strangers' distorted portraits, and in accepting these images as innocent jokes, one smiles at one's own pictures as well as at those of the others. However, a more intense level of exhilaration—laughing—can perhaps only be elicited by their own images in persons who can laugh at themselves. Showing the same level of exhilaration at strangers' distorted portraits might be related to laughing at others and thus capture another trait (e.g., the joy from laughing at others: Katagelasticism, Ruch & Proyer, 2009), but it was not correlated with laughing at oneself.

There is evidence that people smile and laugh less in solitary conditions (e.g., Fridlund, 1991; Provine, 2000). One argument might be that the participants have been laughing because they imagined interactions with other persons and “communicated” with them (i.e., Fridlund, 1991). However, participants were instructed not to do so (unlike in the experimental conditions and like in the control condition in Fridlund's study). Also, we did use portraits of strangers and not known persons, which might have established such an effect more easily. Moreover, the communicative function of the enjoyment displays should not have influenced the subjective funniness ratings. Facial displays of enjoyment were however

related to the funniness ratings. Thus, this explanation was excluded to the degree possible for the present condition.

However, a possible limitation of the present study might have been the distorted portraits of strangers. As they were indeed complete strangers to the participants, the participants didn't know how the strangers looked like when "undistorted". Because of this missing incongruity, undistorted stranger to distorted stranger, distorted portraits might just not be as funny as their own ones, or as distorted portraits of people the participants know. Furthermore, the degree of familiarity or intimacy with the person on the distorted portrait might influence the participants' responses. There is, however, no easy solution to this issue. The degree of familiarity or intimacy of the participants and their friends, relatives, or partners would have varied strongly and would have been difficult to compare. Furthermore, the direct involvement of friends or partners would have meant to incur logistical problems, and furthermore might have resulted in unwanted and not easily controllable effects. The participants themselves were not to know about the kind of portraits they would be shown before the experiment. If we had invited the participants to bring their friends along, they might indeed have started to imagine interactions with those friends (see above). Also, anonymity was ensured towards the participants and their peers, which would have made it difficult to find out who the friends are to acquire portraits of the friends without the participants' knowing. Moreover, managing to so could result in smiles and laughter that reflect admiration rather than laughing at their friends, or on the negative side this also might trigger paranoia and anger about having been tricked and even more about having their privacy invaded. The latter might obviously also be an impossible experimental setup for ethical reasons.

Another solution might have been distorted portraits of celebrities, but these could have been of a person not known by some of the participants and known by others. In addition, some participants might have liked the celebrity displayed on the portrait and some might

have disliked them, which would have further distorted the results. Portraits of complete strangers had the advantage of providing the same conditions for all participants. Also, there *were* participants who found complete strangers' portraits funnier than their own ones (the difference score of funniness ratings of their own and strangers' portraits ranged from -1.92 to 2.83,  $M = .53$ ,  $SD = .78$ ). Finally, due to the distortion it is not always guaranteed that the person, i.e., the friend or film star, would be recognized in all cases<sup>2</sup>. One possibility might be to take portraits of the experimenter (whom all participants know from the experiment) as comparison portraits. This was done in a follow-up study done by Hofmann (2010). There were significantly more laughing responses to one's own portraits compared to the experimenter's ones. Also, participants showed AU12 more frequently accompanied by negative markers in response to the experimenter's portraits as compared to portraits showing themselves. This indicates that participants don't seem to laugh at a familiar face in the sense of knowing the undistorted face, and that the experimenter's portraits might even have elicited negative emotions.

#### *Laughing at Oneself and Humor Temperament*

As for Ruch and Carrell (1998), in the current study high trait cheerfulness and low trait seriousness predicted laughing at oneself. Habitually cheerful participants also responded more likely with AU12 smiles and rated funniness. On the contrary, but not surprisingly, trait bad mood was negatively related with almost all exhilaration behaviors. However, trait seriousness was weakly, but *positively*, correlated with displaying AU12 in response to one's own images. It might be that the task per se also appealed to the serious people, as they did only know that they would have to rate some pictures the content of which they did not know before.

The results concerning the mood states very much corresponded to the findings of previous research on the temperamental basis of humor and sense of humor measures (Ruch

& Köhler, 2007). Participants who reported to laugh at themselves arrived for the experimental part in a cheerful, non-serious, and good mood. Also, subsequent to the task, their mood states were related in the expected way, but the correlations were smaller than in the pretest. However, regarding the behavioral responses, for the majority of indicators the correlation increased from before to after the task. In general, experienced and actually displayed exhilaration during the task lead to enhanced mood subsequent to it.

### *Conclusion*

The present approach is the first to examine the phenomenon of laughing at oneself experimentally. In this study, the focus of laughing at oneself was triggered by one's own appearance. Using distorted portraits of the participants, it could not only be shown that "laughing at oneself" exists and different methods of its measurement converge. It was also demonstrated that the behavior is, indeed, laughing. The tendency to laugh at oneself seems to be a trait-like characteristic, and cheerful, not overly serious people who don't tend to be too strongly affected negatively seem to laugh at themselves more. But a cheerful mood state is also helpful for laughing at oneself. The genuine smiling and laughter of the participants and their relatedness to a "laughing at oneself" questionnaire measure also contradicts La Fave's et al. (1996) argument that laughing at oneself could not possibly be a happy event. Fake or masking smiles, i.e., smiles that did *not* reflect enjoyment, were even negatively related to this measure.

However, the task the participants were asked to carry out was rather passive in that they did not have any possibility of controlling it. It would be interesting to investigate laughing at oneself in a more active context in which participants can determine the "intensity" of a stimulus. Also, one's own embarrassing events, mishaps, or other aspects of laughing at oneself would be worth studying. Alternatives to portraits of complete strangers should be

tested as well. Yet, despite these limitations, the current study succeeded in providing first empirical evidence on the phenomenon of laughing at oneself.

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## Footnotes

<sup>1</sup> The term *exhilaration* is derived from its Latin root (*hilaris* = cheerful) to denote either the process of making cheerful or the temporary rise in cheerful state (Ruch, 1997). Current dictionaries list two meanings for “exhilarate”. These are “to make cheerful or merry” and “to enliven; invigorate; stimulate” (Webster’s Encyclopedic Unabridged Dictionary of the English Language; 1989). The latter meaning is not referred to by the German term *Erheiterung* on which our usage of *exhilaration* is based.

<sup>2</sup> This issue would not apply to the participants themselves, as they are most familiar with their own face and also with the clothes or trinkets they were wearing as well as the surrounding when the picture was taken in the beginning of the experiment.

## Table Titles

Table 1.

*Means, Standard Deviations, Skewness, Kurtosis, and Correlations with Gender of Laughing at Oneself (Self and Peer), State and Trait Cheerfulness, Seriousness, and Bad Mood, and Responses to the Distorted Portrait Judgment Task.*

Table 2.

*Partial Correlations between Laughing at Oneself (Self and Peer), Trait and State Cheerfulness, Seriousness and Bad Mood, and Verbal and Facial Indicators of Funniness and Aversion Towards the Different Subsets of Distorted Portraits, Controlled for Gender.*

## Figure Captions

*Figure 1.* Example stimuli of distorted images of the participant's face (Distorted Portraits of Oneself). <sup>a</sup> The photographs in the figure demonstrate the distortion effects used for the Distorted Portraits of Oneself. They don't show an actual participant. <sup>b</sup> The image numbers represent the position of the images out of the Distorted Portraits of Oneself within the presentation sequence of all 18 stimuli.

Table 1.

*Means, Standard Deviations, Skewness, Kurtosis, and Correlations with Gender of Laughing at Oneself (Self and Peer), State and Trait Cheerfulness, Seriousness, and Bad Mood, and Responses to the Distorted Portrait Judgment Task.*

Variables	<i>M</i>	<i>SD</i>	<i>Sk</i>	<i>K</i>	Corr. with gender
Laughing at yourself, Self-report (SHS)	14.80	3.16	-0.90	0.97	.12
Laughing at yourself, Peer-report (SHS)	13.60	2.81	-0.18	-0.33	-.20†
Trait cheerfulness (STCI-T)	63.23	9.38	-0.74	-0.14	.24*
Trait seriousness (STCI-T)	46.52	6.54	-0.13	-0.06	-.09
Trait bad mood (STCI-T)	36.91	12.47	0.62	-0.72	-.18
State cheerfulness (STCI-S), t1	27.03	5.97	-0.39	-0.19	.14
State cheerfulness (STCI-S), t2	29.58	6.45	-0.83	0.80	.15
State seriousness (STCI-S), t1	22.74	5.49	0.02	-0.39	-.20†
State seriousness (STCI-S), t2	19.09	6.36	0.99	0.80	-.20†
State bad mood (STCI-S), t1	13.53	4.65	1.51	1.55	.00
State bad mood (STCI-S), t2	12.64	4.08	1.62	2.11	-.07
Agreement Form	3.51	1.12	-0.02	-1.35	.03
PorO, funniness	4.36	1.17	-0.78	0.53	.03
PorO, aversion	1.94	1.28	1.56	1.63	.14
PorS, funniness	3.83	0.93	0.02	0.33	.11
PorS, aversion	1.57	0.85	1.79	2.51	.05
PorO, AU12 occurrence	0.58	0.28	-0.51	-0.76	-.04
PorO, AU6+12 occurrence	0.38	0.28	0.00	-1.34	-.22†

(continued)

Table 1. (continued)

Variables	<i>M</i>	<i>SD</i>	<i>Sk</i>	<i>K</i>	Corr. with gender
PorS, AU12 occurrence	0.40	0.30	0.50	-0.82	.09
PorS, AU6+12 occurrence	0.16	0.19	1.29	0.77	-.03
PorO, AU12, intensity	1.70	0.98	0.01	-1.03	-.10
PorO, AU6+12, intensity	1.43	1.15	0.35	-0.90	-.12
PorS, AU12, intensity	0.79	0.63	0.60	-0.63	.11
PorS, AU6+12, intensity	0.41	0.51	1.27	0.90	.02
PorO, frequency of laughter	0.21	0.39	2.80	8.80	-.09
PorS, frequency of laughter	0.04	0.08	3.37	13.58	-.09
PorO, Fake AU12, Occurence	0.10	0.13	1.09	1.04	.11
PorS, Fake AU12, Occurence	0.05	0.09	1.96	3.85	.03

Note.  $N_{self} = 65-70$ .  $N_{peer} = 126$ .

SHS = Sense of Humor Scale; STCI = State-Trait-Cheerfulness-Inventory; T = Trait part; S = State part; t1 = testing time 1; t2 = testing time 2; t3 = testing time 3; PorO = Distorted Portraits of Oneself; PorS = Distorted Portraits of Strangers; AU = Action Unit; AU6+12 = AU6 + AU12 (Duchenne display); Fake AU12 = Fake or blended AU12; Corr. = correlation; Gender: 1 = male, 2 = female.

†  $p \leq .05$  (one-tailed). \*  $p \leq .05$ .

Table 2.

*Partial Correlations between Laughing at Oneself (Self and Peer), Trait and State Cheerfulness, Seriousness and Bad Mood, and Verbal and Facial Indicators of Funniness and Aversion Towards the Different Subsets of Distorted Portraits, Controlled for Gender.*

LaY Indicators	LaY self	LaY peer	T-CH	T-SE	T-BM	S-CH t1	S-CH t2	S-SE t1	S-SE t2	S-BM t1	S-BM t2
LaY self		.34**	.30*	-.10	-.06	.46***	.39***	-.39***	-.30*	-.35***	-.28*
LaY peer	.34**		.19	-.40***	-.10	.13	-.05	-.24*	-.05	-.12	-.06
PorO laugh fr. <sup>a</sup>	.26*	.27*	.19	-.08	-.27*	.15	.20	-.21†	-.22†	-.07	-.09
PorS laugh fr. <sup>a</sup>	.05	.09	.20	-.07	-.27*	.08	.09	-.07	-.06	.11	.09
PorO laugh qu. <sup>b</sup>	.30*	.30*	.23	-.19	-.26†	.18	.18	-.19	-.22	.03	.05
PorS laugh qu. <sup>c</sup>	-.17	.03	-.08	-.21	-.06	-.04	-.08	.13	.17	.24	.18
PorO 12 occ.	.23†	.08	.30*	.20	-.32**	.19	.33**	-.20	-.33**	-.23†	-.27*
PorO 6+12 occ.	.25*	.13	.25*	.11	-.30*	.11	.30*	-.21†	-.35**	-.25*	-.31*
PorS 12 occ.	.18	.09	.23†	.08	-.23†	.16	.25*	-.24†	-.24†	-.13	-.15
PorS 6+12 occ.	.23†	.18	.22†	.01	-.19	.09	.11	-.16	-.13	.03	.02
PorO 12 int.	.24†	.11	.18	.10	-.24†	.14	.31*	-.28*	-.37**	-.20	-.24†

(continued)

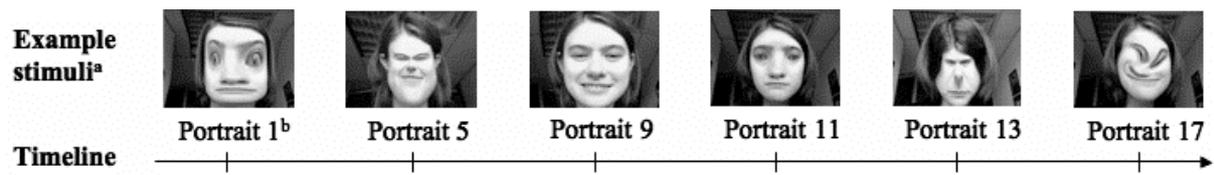
Table 2 (continued).

LaY Indicators	LaY self	LaY peer	T-CH	T-SE	T-BM	S-CH t1	S-CH t2	S-SE t1	S-SE t2	S-BM t1	S-BM t2
PorO 6+12 int.	.25*	.15	.12	.03	-.19	.09	.27*	-.22†	-.34**	-.20	-.26*
PorS 12 int.	.21†	.09	.24†	.06	-.19	.17	.25*	-.29*	-.27*	-.08	-.09
PorS 6+12 int.	.22†	.16	.21†	.04	-.17	.11	.16	-.21†	-.18	.03	.02
PorO f	.28*	.16	.25*	.06	-.25*	.26*	.49***	-.30*	-.53***	-.39***	-.44***
PorO a	-.18	-.13	.14	-.08	-.12	-.01	-.10	.04	.08	.00	.01
PorS f	.19	.06	.22†	.12	-.13	.24*	.40***	-.14	-.36**	-.28*	-.32**
PorS a	-.24*	-.25*	.17	.10	-.21†	.10	.07	.07	.05	-.04	-.04
PorO Fake12 fr.	-.29*	-.13	-.11	.06	.18	.02	.02	.14	.16	.10	.19
PorS Fake12 fr.	-.08	.10	.01	.11	-.05	-.12	-.15	-.03	.04	.03	.09

Note.  $N = 65 - 70$ .  $N^b = 53$ ;  $N^c = 40$ .

LaY = Laughing at yourself; LaY self = Self-report of laughing at oneself (SHS, Sense of Humor Scale); LaY peer = Peer-report of laughing at oneself (SHS); CH = Cheerfulness (STCI, State-Trait-Cheerfulness-Inventory); SE = Seriousness (STCI); BM = Bad Mood (STCI); T- = Trait Part of the STCI; S- = State Part of the STCI; t = testing time. Por = Distorted Portrait; O = Oneself; S = Stranger; f = funniness; a = aversion; 12 = AU12; 6+12 = AU6 + AU12 (Duchenne display); Fake12 = Fake or blended AU12; int. = maximal intensity; fr. = frequency; occ. = occurrence; laugh qu. = laughing quotient (laugh fr./AU6+12 fr.). <sup>a</sup> Variables were transformed using the square root.

†  $p \leq .05$  (one-tailed). \*  $p \leq .05$ . \*\*  $p \leq .01$ . \*\*\*  $p \leq .001$ .



*Figure 1.* Example stimuli of distorted images of the participant's face (Distorted Portraits of Oneself). <sup>a</sup> The photographs in the figure demonstrate the distortion effects used for the Distorted Portraits of Oneself. They don't show an actual participant. <sup>b</sup> The image numbers represent the position of the images out of the Distorted Portraits of Oneself within the presentation sequence of all 18 stimuli.