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Chapter 5

A TEMPERAMENT APPROACH TO HUMOR

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ABSTRACT

Due to the shortcomings in understanding humor, a state-trait model of cheerfulness, seriousness and bad mood was introduced to describe the temperamental basis of the sense of humor [1-4]. This chapter sketches the development and characteristics of the postulated state-trait model and presents its relationship to different models of the sense of humor. Literature will be reviewed that shows that trait cheerfulness accounts for most variation in existing self-report assessment tools of the sense of humor. Further, the relation of trait cheerfulness to health and well-being related variables (e.g., flourishing [5]; coping [6] and life satisfaction, [7]) will be discussed. Attention is given to experimental and correlational evidence, which shows that trait cheerfulness is positively related to adaptive coping mechanisms, positive experience and well-being. This is particularly interesting for cheerfulness interventions to fostering well-being and overcoming adversities. Finally, implications for the study of positive traits and respective interventions will be discussed.

INTRODUCTION: WHY A TEMPERAMENTAL APPROACH TO THE SENSE OF HUMOR?

As previously noted, at a formal level, the expression "sense of humor" refers to a personality characteristic aimed at describing habitual individual differences in humor-related behavior [8]. Like any personality trait, the sense of humor is a descriptive hypothetical construct. It is an invention of the human mind, not an existing entity. The sense of humor cannot be observed directly but is inferred via indicators, such as observed behavior or reported experience. It refers to a disposition for humor-related behavior not to the behavior itself. Thus the sense of humor is a hypothetical disposition referring to individual differences that correlate with observed humor behaviors. So, what then is “humor”?

Outside of psychology, "humor" may also refer to artifacts and products (like humorous stories, comedies, films, jokes) but in psychology it is relating to individuals and their feelings, thoughts and actions. There are many facets of humor behavior and experience (e.g., comprehension, enjoyment, creation, initiation, entertainment), and they involve many domains of psychological functioning (e.g., perception, cognition, emotion, motivation, attitudes, performance). Individuals differ in these feelings, thoughts and actions not only in one situation but habitually, and if some or all of these are intercorrelated they might be accounted for by a personality concept, such as the "sense of humor." However, the phenomena listed above are very diverse and it is unlikely that they can be traced back to a single dimension of low vs. high sense of humor. As Craik, Lampert and Nelson [9] demonstrated, the concept of "sense of humor" only covers some of everyday humorous conduct (in their view it is the socially warm and competent humor styles). Hence, a comprehensive approach to the sense of humor, meaning one that is aimed at representing all humor-related behavior, will most likely arrive at a multidimensional concept. This has not yet been undertaken and one can state that the "sense of humor" is still more of a folk-concept that has not been explicitly converted into a scientific construct so far.

The same humor-related feelings, thoughts and actions can be accounted for by personality traits other than the sense of humor. For example, elements like the tendency to laugh easily, to initiate humor, etc. were seen as components of the sense of humor [10,11]. They can also be subsumed under the higher order personality factor of extraversion. Not surprisingly, Ruch and Deckers [12] found extraversion and such defined sense of humor to be highly correlated. Sense of humor is also not the only expression that may be used; one might also speak about "trait humor," "humor styles" or use other expressions referring to the component of humor investigated (e.g., wit, nonsense, sarcasm).

Humor behaviors are often content saturated. For example, someone will laugh at lot at Monty Pythons *Life of Brian*, find sexist jokes offensive, or readily attend a carnival session and dress up as a pirate or ghost. The expression of humor may be cultural or even regional, and certain forms of amusement might be in or out of fashion. Yet, the underlying tendencies (e.g., laughing easily, enjoying to play with ideas, a robustness of positive mood, preference for true meaning compared to "as if" thoughts and acts) might be universal. Asking someone whether he or she laughs at the *life of Brian* confounds two elements: whether one likes this film or not and whether one laughs easily or more reluctantly. If we want to know whether someone enjoys *the life of Brian*, then looking at laughter in response to the film just adds a source of variance that is not needed. If we want to know whether one has an inclination to laugh in general, then it is better to just ask this and leave out the specific elements that might add noise (as some who likes to laugh a lot maybe doesn't like this film and hence won't laugh at all). Likewise, carnival is not practiced everywhere and hence people don't report dressing up in funny costumes, just for the sheer fact that it is not common there.

Ruch and colleagues [2,3,13,14] conducted a series of studies based on the observation of *interindividual* (i.e., between individuals) and *intraindividual* (i.e., across situations) variation in humor behavior. They argued that it is commonly observed that certain individuals tend to *habitually* appreciate, create, or laugh more easily/ intensively/or more often at humorous stimuli than others do. Aside of interindividual differences which are relatively stable over time, there are also *actual* dispositions for humor, varying across situations and time. Phrases like to be *in good humor, in the mood for laughing, out of humor, in a serious mood or frame of mind* etc. refer to such states of enhanced (or lowered) readiness to respond to humor [15].

This chapter discusses the state-trait approach of the temperamental basis relevant for the behavioral and experiential domain of humor [1,2,15,16]. This approach does not claim to be comprehensive for *all* kinds of humor-related behaviors. The state-trait model acknowledges that the disposition for humor varies intra- and interpersonally and that the utilization of the same concepts as both states and traits allows us to study the relevance of homologous actual and habitual dispositions. While the expression of humor may be culture specific and differ over time, the affective and mental foundations of humor will more likely be universal [14]. Thus, generally content-saturated humor contents and items will be largely missing in the model and its inventory, but the nature of the concepts will still allow for hypothesizing links to humor phenomena.

Rather than describing humor behaviors, thoughts, and feelings, the underlying mental state and affective basis are the focus of this approach. In short, *trait cheerfulness* is a disposition facilitating the expression of humor, while *trait seriousness* and *trait bad mood* represent dispositions for different forms of humorlessness [2]. These traits form the *temperamental basis* of humor, and their respective states represent dispositions for humor that vary within persons over time. As there is no agreement on the nature of the sense of humor yet, the study of its temperamental basis may help systematizing existing results, training the sense of humor, and developing intervention programs to foster positive health outcomes.

THE EMOTION OF EXHILARATION

The state-trait model of cheerfulness arose from the experimental study of the emotional responses to humor [13]. The emotion of exhilaration (from the Latin root *hilaris*) had been defined as either the process of making cheerful or the temporary rise and fall of a cheerful state [13]. This term is used as a technical term and it is based on its original meaning (the raise of hilarity). This emotion was also referred to as amusement, hilarity, or mirth [17]. Exhilaration most often occurs in response to humorous stimuli, but also to inhaling nitrous oxide and being tickled [18]. Among the 6 or 7 basic emotions by Ekman [19] that have a distinct and universal facial expression, exhilaration was seen to be one the facet of joy (or happiness) that is most strongly aligned with laughter.

Exhilaration can be described at the behavioral, the physiological and the experiential level [13]. Behaviorally, exhilaration is expressed in smiling and laughter. While there are about 20 types of smiles to be distinguished, only the so-called Duchenne display can be observed when people are enjoying themselves. This genuine smile of enjoyment involves the simultaneous and symmetric contraction of two muscles: the zygomatic major muscle and the orbital part of the orbicularis oculi muscle. The action of the zygomatic major pulls the lip corner obliquely up and back, and deepens the furrow running from the nostril to the lip corner. The orbicularis oculi muscle lifts the cheeks upward and draws the skin toward the eyes from the temple and cheeks. It narrows the eye opening and may cause “crow’s feet” wrinkles to appear at the outer corner of the eye opening [20]. Ekman, Davidson, and Friesen [21] named this smile to honor the man who first described it, Duchenne de Boulogne (a French anatomist of the 18th /19th century).

By coding the face with the help of the Facial Action Coding System (FACS) [22], or EMG, one can distinguish between this genuine smile (and laughter) and other smiles. This includes phony and masking smiles, where nothing much is felt but one wants to appear amused and where negative emotions are felt but one wants to appear amused in the latter [19-26].

Laughter includes a Duchenne display, and the contraction of a number of further muscles, such as the m. levator labii superioris, m. risorius, m. mentalis, m. depressor anguli, and orbicularis oris muscle [27], as well as muscles relaxing/showing lower contraction during laughter (typically the m. frontalis and corrugator supercilli muscle). It typically involves a laughter sound that can be distinguished by different features (voiced, unvoiced, single sounds such as "ha", and plural sounds, e.g., "ha ha"; [28]). The sounds are extremely diverse, including all vowels and many consonants, but also voiceless laughter.

Smiling and laughter represent different levels of intensity of exhilaration [13]. Whereas laughing occurs at higher levels of exhilaration, smiling typically occurs at lower levels, with different intensity levels of smiling also representing different degrees of exhilaration. As already noted by Darwin [29] with increasing intensity of laughter, movements of the trunk and the limbs may occur as well as changes in posture.

Among the many physiological responses to humorous stimuli [13], for example, changes in heart rate and of skin conductance have already early been used as markers of intensity of responses to humor [30]. But there are more physiological changes known that are typical for exhilaration. Figure 1 gives a physiological recording of long laughter episode (consisting of many laughter bouts) of one male participant who inhaled laughing gas during trial runs prior to an experiment [18]. The term *laughter bout* was used by Ruch and Ekman [28] to refer to a whole behavioral-acoustic event, including the respiratory, vocal, and facial and skeletomuscular elements of a laugh. A laughter bout may be segmented into an onset (i.e., the pre-vocal facial part which is very short in the case of explosive laughter), an apex (i.e., the period where vocalization or forced exhalation occurs), and an offset (i.e., a post-vocalization part; often a long-lasting smile fading out smoothly). The laughter vocalization period is composed of *laugh cycles*, i.e., repetitive *laugh-pulses* interspersed with pauses. There is laughter with only one or two pulses (as in an "ha"-type "exclamation laugh"), but studies typically report that four pulses in a laugh cycle are most frequent. The upper number of pulses in a laugh cycle (a maximum of 9-12 is reported) is limited by the lung volume.

During an unusually long laughter episode, there is a joint contraction of the zygomatic major and orbicularis oculi muscle at the onset of the laughter that prevailed throughout the entire episode. It can also be seen from the recordings of respiratory movements (through an elastic band on both chest and abdomen) and the electromyographic recordings (from the diaphragm) that there is an initial forced exhalation at the onset of laughter, followed by a laugh cycle (that is visible in activity of high frequency and low amplitude). This is consequently followed by inhalatory movements, which, again, are followed by a steeper exhalatory movement and the next laughter cycle. The heart rate increases and its variability is reduced, and characteristic changes in skin conductance occur, that have been reported before [13]. Further changes are discussed [31]. Reviews of the neuroanatomical conditions of smiling, laughter, the emotion of exhilaration and the various processes are given elsewhere [32-34].

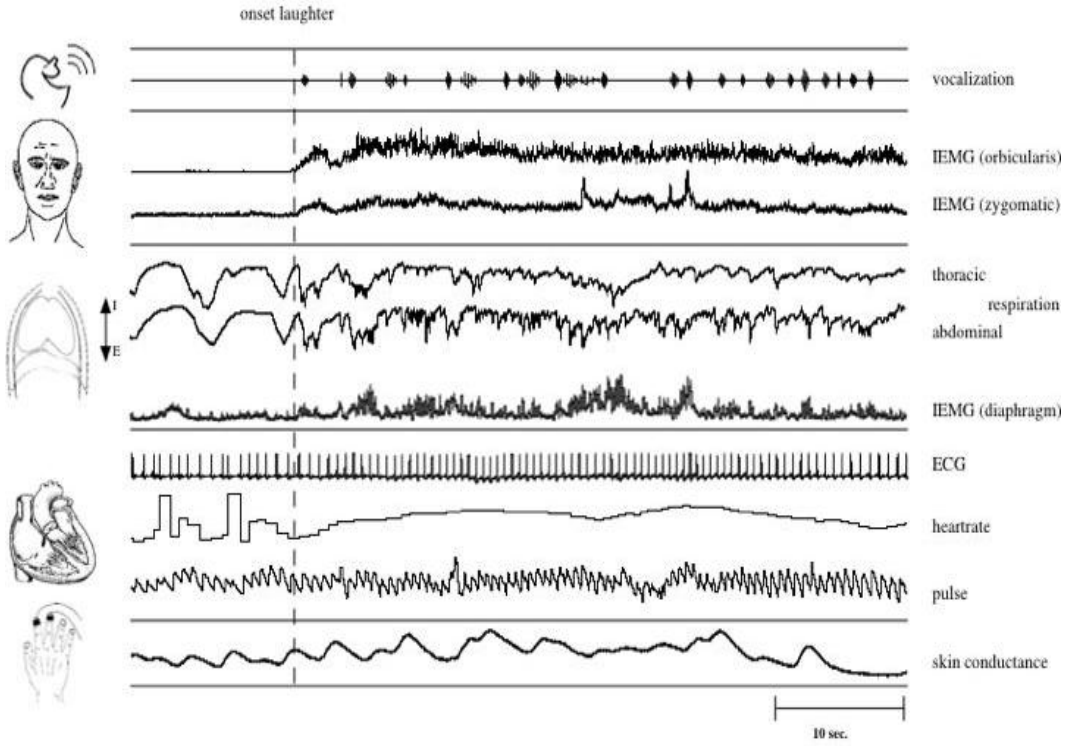

Figure 1. A laughter episode: Physiological response pattern for the emotion of exhilaration.

The experiential level of exhilaration incorporates, as with other emotions, the awareness of one's own actions and action tendencies (“I feel, I will burst out laughing”), of physiological changes (“my belly hurts of laughing”), and of the feeling structure (i.e., exhilaration may be seen as a pleasurable, relaxed excitation). Furthermore, this goes along with the awareness of the situation's meaning structure (e.g., being with friends and remembering school pranks) and the perception of stimulus properties (e.g., funniness in absurdity) of the exhilaration-inducing stimulus [13,27,32]. As exhilaration is defined as a temporary rise in a cheerful state, it is implied that the emotional experience changes over time. Typically, a sudden and intense increase in cheerfulness is expected, followed by a more or less pronounced plateau and a prolonged fading out of the emotional tone. The three levels are expected to be coordinated and indeed the relationship between facial expression and experience is quite high, given the coherence is sought for within individuals [35].

The complete model of the emotion of exhilaration includes the eliciting stimuli and conditions (the exhilarants, [36]), the consequences (social, health, etc.), and the actual and habitual (personality) moderating factors that have an impact on ones exhilaratability. The actual factors may be situative (e.g., presence of others) and organismic (e.g., mood, frame of mind) and the habitual factors relate to personality. Indeed, it is assumed that the threshold for laughter and exhilaration varies inter- and intraindividually, and this is why a state - trait model of cheerfulness, seriousness and bad mood was developed.

THE STATE-TRAIT MODEL OF CHEERFULNESS, SERIOUSNESS AND BAD MOOD

Several model implications are postulated: The state-trait model of cheerfulness, seriousness and bad mood considers humor multidimensional, meaning that people differ on more than one dimension. Secondly, it takes into account that humor is not unipolar, implying that humorlessness needs to be represented as well. Thirdly the model covers affective and mental factors relating to moods/temperaments and frames of mind. The basic structure of the model is outlined in Figure 2. Signs express the hypothesized relationship between cheerfulness, seriousness, and bad mood as states and traits and exhilaratability; i.e., the inclination to respond favorably to humor.

Figure 2 shows that exhilaratability is composed of cheerfulness, seriousness, and bad mood both as distinctive states and traits. It emphasizes that there are different degrees of how long the different states are stable, ranging from short-lived fluctuations in mood but also more tonic changes in mood level. Nevertheless, a deliberate distinction is made whether the subjects report their actual feelings (i.e., in a given moment) or their habitual feelings and behavior. Such states of seriousness, cheerfulness, and bad mood will fluctuate within individuals, but they may also be produced by experimental procedures to study causal hypotheses between states and the threshold for the release of exhilaration [2,15,37].

Cheerfulness as a mood state and cheerfulness as a personality trait were both assigned prominent roles in exhilaratability: Both should serve for controlling (i.e., predicting or explaining) individual differences. A concept of cheerfulness as an enduring disposition is necessary, since individuals differ habitually in the frequency, intensity, and duration of cheerful mood states, as well as in the ease with which exhilaration is induced [13]. As described, individuals of habitually higher levels of cheerfulness will be more susceptible to the induction of exhilaration than those of a comparable low level of cheerfulness. The reverse will be true for individuals with habitually high levels of seriousness or bad mood. They will be less readily inclined to respond positively to a given stimulus than those low in these characteristics. It was hypothesized that trait-cheerfulness can be subsumed under the higher-order temperament dimension of extraversion-introversion which is a determinant of a generalized susceptibility to positive affect [38].

Different facets of cheerfulness as mood states were distinguished [3]. A cheerful mood, which is marked by a more tranquil and composed mood state, is distinguished from hilarity, which is marked by a merry mood state (more shallow and outward). Exhilaration and state cheerfulness are conceptually different, but there is a reciprocal relationship between them: A cheerful state facilitates the induction of exhilaration, and an accumulation of exhilaration responses may lead to longer-lasting changes in the level of cheerfulness [13]. Also, if the induction of exhilaration fails, the cheerful state may be lowered. A cheerful mood lasts longer, fluctuates less and is less dependent on eliciting stimuli [13].

The operational definitions of the three concepts were defined with the help of facets or definitional components of the traits. These facets were derived on the basis of the following sources: a lexical study (e.g., definitions of the terms in encyclopedias of several languages); studies of the linguistic field (e.g., of synonyms and antonyms); study of prior related concepts; study of the German literature on cheerfulness, seriousness, sadness, and ill-humor [39]; early American studies on cheerfulness-depression [40,41]; prior factor analytic work of

humor questionnaires [8]; and factor analytic studies of trait-adjectives and further research [41[1]]. Facets (or definitional components) were generated on this basis. The concept of cheerfulness (CH) comprised the following five facets: a prevalence of cheerful mood (CH1), a low threshold for smiling and laughter (CH2), a composed view of adverse life circumstances (CH3), a broad range of active elicitors of cheerfulness and smiling/laughter (CH4), and (CH5) a generally cheerful interaction style [2,15].

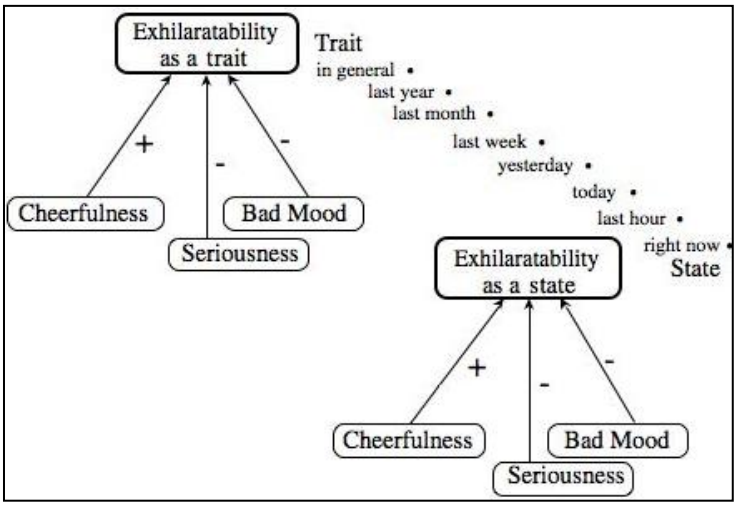

Figure 2. A state-trait model of cheerfulness, seriousness, and bad mood.

A major assumption states that cheerfulness contributes to robustness of mood, meaning that individuals high in trait cheerfulness are able to maintain a high level of state cheerfulness (and retain a low level of state bad mood) in the presence of factors prone to negative moods, while individuals low in trait cheerfulness are more likely to loose humor (get grumpy and out of cheerful mood), when facing adversity [14,37]. This assumption is very important when investigating the relationship between trait cheerfulness, health and well-being associated variables and will be specified later in this chapter. This potential of cheerfulness includes getting into state cheerfulness more easily (*threshold in*); stating that it takes less potent stimuli to induce cheerful mood. This should also be true when factors capable of inducing negative affects become active (*robustness*, or *threshold out*); i.e., it takes a more potent aversive stimulus to bring highly cheerful out of that state. Furthermore, it implies for high cheerful individuals to experience the cheerful mood more strongly (*intensity*), and remaining in that state longer (*duration*) until it fades out naturally. Finally, once a stimulus alters mood to the negative, trait cheerful individuals will rebuild the cheerful mood faster (*speed of mood recovery*); i.e., high trait cheerful people will overcome the negative affects associated with adverse situations more quickly [2,3,42,43]. While the first three relations are common to describing relationships between states and traits, the latter two are relatively new and were created to help discussing and explaining facts typically associated with the "sense of humor" within the state-trait model of cheerfulness [43].

[1] Young (1937) found a positive correlation between retrospectively reported cheerful mood during the last 24 hours and laughter; exemplifying the relevance of state cheerfulness.

The idea of robustness of mood is especially well compatible with the facet of cheerful composure (the cheerful-composed individual has a positive and carefree outlook of life, can unwind well, and enjoys the present moment; he/she can accept even unpleasant circumstances calmly and with composure, can look on the light side of things and is able to find something positive in them). This factor is expected to be the best predictor of robustness among all components of trait cheerfulness. So far no research has been carried out regarding the mood recovery hypotheses, but the other postulates will be discussed later in this chapter, as this notion of keeping a cheerful view on life even when facing adversity will closely relate to positive health outcome variables, such as coping with stress and maintaining life satisfaction.

In contrast, trait and state bad mood are assumed to increase the threshold for exhilaration [13]. The concept of bad mood (BM) is composed of the predominance of three mood states and their respective behaviors. These components are a generally bad mood (BM1), sadness (i.e., despondent and distressed mood; BM2), and ill humouredness (i.e., sullen and grumpy or grouchy feelings; BM4). Two further facets are specifically related to the sad (BM3) and ill-humored (BM5) individual's behavior in cheerfulness evoking situations, their attitudes toward such situations and the objects, persons, and roles involved. The role of trait bad mood has also been acknowledged by McGhee [44] who listed negative mood as one of eight defining components of *low* sense of humor. While other conceptualizations of the sense of humor do not explicitly include this affective form of humorlessness, items of scales sometimes relate to bad mood. However, bad mood might also be a disposition facilitating certain forms of humor, such as mockery, irony, cynicism, and sarcasm [14,45].

Moreover, the likelihood of a person responding to a humor stimulus with exhilaration not only depends on the predominant mood state, but also on the frame of mind (e.g., seriousness). The concept of seriousness (SE) is made up of the elements of the prevalence of serious states (SE1), a perception of even everyday happenings as important and considering them thoroughly and intensively, rather than treating them superficially (SE2), the tendency to plan ahead and set long-range goals and attaining the closest possible harmony with these goals in every action and decision (SE3), the tendency to prefer activities for which concrete, rational reasons can be produced thereby considering activities which don't have a specific goal as a waste of time and nonsense (SE4), the preference for a sober, object-oriented communication style, meaning to say exactly what one means without exaggeration or ironic/sarcastic undertones (SE5), and a "humorless" attitude about cheerfulness-related behavior, roles, persons, stimuli, situations, and actions (SE6). For people in a serious frame of mind, the threshold of exhilaratability is enhanced, and for people in low serious state (i.e., playful), this threshold is lowered [14].

As shown, the facet model also distinguishes among several forms of "humorlessness". While both serious individuals and those in a bad mood may be perceived as being humorless, they are so for different reasons. In the latter case, the generation of positive affect is impaired by the presence of a predominant negative affective state. In the former case, there is lowered interest in engaging in humorous interaction or in switching into a more playful frame of mind; i.e., a stronger aspect of volition is involved. There may be differences within the concept of bad mood as well. While an ill-humored person, like the serious person, may not want to be involved in humor, the person in a sad mood may not be able to do so. Also, while the sad person is not antagonistic to a cheerful person, the ill-humored one may be. Despite the fact that the prediction of individual differences in exhilaratability was the original motive

for postulating and examining the three concepts of cheerfulness, bad mood and seriousness, it is expected that the model is not only valid for other forms of humor behavior but transcends the boundaries of humor research as well.

In sum, at least one facet (CH1, SE1, BM1, BM2, BM4) of any concept defines the postulated state-trait link, describing that the respective state occurs more often, lasts longer, and is of higher intensity than the average. Furthermore, for all constructs, at least one facet (CH5, SE6, BM3, BM5) describes the behavior of a prototypical person in a specifically cheerful environment or his/her response to exhilarating situations and stimuli, as well as the generalized attitude towards that field.

RELATIONSHIPS AMONG THE FACETS OF THE MODEL

It is expected that the facets of the three constructs are homogeneous; i.e., facets of one construct will tend to inter-correlate highly positively and there will be lower correlations with facets of other constructs. Cheerfulness and bad mood have in common that they are *affective* concepts; the hedonic tone of the former is positive and the latter negative.

As states they appear to be opposites: one can hardly be cheerful and in a bad mood simultaneously. The successful induction of a cheerful state seems to imply that it will replace the bad mood; meaning that bad mood will cease in intensity. While they may not be present at the same time as states, there will be individuals predisposed to both states (e.g., the cycloid temperament according to Kretschmer [46]). Thus, at the habitual level, the negative correlation between cheerfulness and bad mood will be lower than at the state level. While the notion of a predominant (cheerful or bad) mood already implies a negative relationship, the strength of that inter-correlation may also be depending on the facet of the trait.

As the facets CH1, SE1, BM1, BM2, and BM4 refer to prevalent states, they are more likely to produce higher correlations. Whether one is able to laugh (CH2) or entertain others (CH5) is more independent of bad mood; as it is claimed, for example, that clowns basically are sad people.

Also, an ill-humored mood may accompany the facilitated tendency of laughing at others. Dictionaries often list seriousness as an antonym of cheerfulness; thus, they are considered to be mutually exclusive terms, suggesting that the presence of seriousness excludes cheerfulness and vice versa. However, while cheerfulness refers to an affective state, seriousness denotes a quality of the *frame of mind*, allowing all combinations of both to occur. The combination of non- cheerful and serious certainly contributes to the perception of a person as being humorless, and the combination of both non-serious and cheerful would depict a playful, fun-loving person and predict a high susceptibility for that person to laugh at humorous stimuli and situations. However, the other combinations will exist, too; for instance, a cheerful temperament might go along with a serious frame of mind. In fact, there is ample reason to assume that this combination is the basis for a certain form of sense of humor [8]. Similarly, there may be the absence of both, as in nihilistic individuals characterized by pessimism/low degree of cheerfulness and low degree of seriousness. Thus, cheerfulness and seriousness will be slightly negatively correlated as traits. The correlation between cheerfulness and seriousness as states will depend on whether the state is event-related and whether the event itself is of a serious or cheerful nature.

The fact that both seriousness and bad mood represent opposites (or partial opposites) of cheerfulness limits the degrees of freedom for them being negatively correlated or orthogonal themselves. Phenomenologically, both share the elements of heaviness and darkness and lack the brightness and lightness of cheerfulness [39]. Again the fact that bad mood refers to an affective state and seriousness to a frame of mind allows them to vary more independently.

Serious people may be high and low in bad mood just as non-serious individuals. However, they react similarly negatively (albeit for different reasons and in a different manner) to humorous situations and stimuli. Thus, the facets of SE6, BM3, and BM5 (depicting the behavior of serious, sad, and ill-humored individuals in the cheerful environment) will support a positive relationship between seriousness and bad mood. As states, seriousness and bad mood will be positively associated as well.

As a prototype, during events of high negative emotionality (even flight or fight), one is concentrated and behaving seriously; meaning that energy is mobilized to be spent purposefully [2]. While bad mood situations may be associated often with a serious frame of mind, the reverse does not have to be true. States of seriousness do not have to be accompanied by a negative mood level. The inter-correlation of serious and bad mood states may increase in response to humorous events; the failure to induce exhilaration in state-serious individuals may increase their bad mood as well [2,3,14].

MEASUREMENT

Instruments were designed for the assessment of these states and traits [2,3]. The long form of the trait part of the *State-Trait Cheerfulness Inventory* (*STCI-T*) is a 106-item questionnaire in a 4-point answer format providing scores for the three traits of *cheerfulness* (STCI-T CH; 38 items), *seriousness* (STCI-T SE; 37 items), and *bad mood* (STCI-T BM; 31 items) and their 5, 6, and 5 definitional components, respectively. Because of the antithetical nature of the concepts a negatively keyed cheerfulness item, for example, could also be seen prototypical for seriousness or bad mood. While the sentence “I feel like laughing” might indicate cheerfulness, its negation ”I don’t feel like laughing” might well indicate sadness. Therefore, negations were only used when they represented standing expressions used in everyday language. In general, a concept-guided strategy in item reduction was preferred to a purely empirical selection of items, although indices derived from factor and item analysis, as well as indices of sensitivity to change were considered [2,3]. From the STCI-T <106>, a standard trait form with 60 items to assess the three traits with 20 items per scale was derived. This version contains items from all facets (at an equal proportion) but is not considered for scoring facets. It was constructed on the following basis: (a) the best corrected item-total correlation (citc), (b) consideration of items content, (c) roughly equal representation of the facets (where this was not possible, core facets got more weight), and (d) avoidance of very similar items as regards content or linguistic usage [2]. Ruch and Köhler [14] report high internal consistencies for the traits (CH α = .93, SE α =.88, and BM α =.94) measured by the standard forms in a sample of 600 adults. Furthermore, the one-month retest-stability was high for the traits (between .77 and .86) but low for the states (between .33 and .36), confirming the nature of enduring traits and transient states [3]. The factor structure is

replicable and generalizable across samples of different nationalities and across length of the time span of the mood covered.

The state version of the STCI initially consisted of 40 items, assessing the constructs of cheerfulness, seriousness and bad mood according to their trait definitions, but with the focus of actual feeling state and with items allowing for sensitive assessment of mood alternations [3]. There is also a 4-point answer format, like in the trait version. The pilot version was tested on several German and American samples, using the technique of thought experiment, in which participants were not exposed to, or tested in state-relevant situations, but rather were provided with different scenarios (describing state-relevant prototypical situations). In the process of test construction, items were eliminated iteratively according to several pre-set criteria, based on results of the construction sample. Cheerfulness, seriousness and bad mood scales were developed with 10 items each (in a stepwise elimination procedure of items). Ruch and colleagues [3] report satisfactory internal consistencies (alpha coefficients from .85 to .94) and the test-retest correlation was low (.33-.36). Modified versions of the STCI-S (with instructions to describe predominant mood states of last week, last month, and last year) were created for the assessment of longer-lasting mood states [14].

Factor analysis of the trait STCI-T <60> and the standard form of the state STCI-S <30> revealed that homologous states and traits are separable. Correlations among heterologous states and traits yielded the expected pattern in every case and were much higher than average coefficients for heterologous pairs: All the traits where highly correlated with their respective state. Cheerfulness in state and trait was negatively related to state seriousness and state bad mood (and the latter two were positively correlated themselves).

Putting the STCI-S to the test, the items sensitively reflected changes in both imagined responses to prototypical situations and perceived own feeling state as naturally occurring or experimentally induced. The intended changes work in both directions, an uplift of state exhilaratability can be documented and so can its repression. Assessment of the three states was undertaken in states of possible altered mood covering naturally occurring mood changes (e.g., in everyday life, such as diurnal variations due to type of weather, success or failure), unobtrusively induced mood changes (e.g., exposing subjects to rooms of different "atmosphere"; experimenter's personality), more or less obtrusively induced mood changes (e.g., experimenter's social behavior; experimental treatments, presentation of humor), and chemically induced mood changes (i.e., inhalation of nitrous oxide, "laughing gas"). The values range between 10 and 40 when applying the STCI-S. For example means in state cheerfulness varied from about 19 (after exposure to situations inducing bad mood) to 35 (sober women during carnival festivities; male volunteers after inhaling nitrous oxide [subgroup of 11 smiling or laughing subjects only]; [15,18]). The level of state cheerfulness was also elevated among soccer fans before an easy to win game on TV, and after exposure to jokes and cartoons [35], a clowning experimenter [37], and an audiotape of interviews of a catching cheerful quality. State seriousness means ranged from 14 (the carnivalists) to 27 (subjects starting a two- hour mental work). Seriousness increased when listening to catching audiotapes of a serious (but also bad mood) quality and decreased in some cheerful situations. Bad mood means were typically low and ranged from 11 (the carnivalists; inhalation with nitrous oxide) to 24 (among soccer fans after their national team dropped out of the World Championships). Furthermore, It was shown that that the STCI-S is a sensitive instrument for assessing longer lasting states too: As expected, depressive patients were significantly lower in state cheerfulness, clearly higher in state seriousness and nearly twice as high in state bad

mood, in comparison to the norm. Similarl results were found for schizophrenic patients compared to the norm [47,48,49,50].

Carretero-Dios, Eid and Ruch [51] applied a multi-trait multi-method method (MTMM) applying confirmatory factor analysis to data on the STCI. The MTMM approach allows separating different sources of individual differences, such as influences due to trait, method and error components. The study aimed at analyzing the convergent and discriminant validity of the trait form of STCI-T <106>. Participants completed the trait form (STCI-T<106>) in a single session and also answered the state form (STCI-S<30>) once a day at predetermined times on eight successive days. Moreover, the participants chose three close acquaintances each who rated them on the peer-evaluation form of the STCI-T<106>. The convergent validity was scrutinized using three different types of methods: self-reports, peer-reports and aggregated state ratings. With respect to the discriminant validity coefficients the authors investigated relations between cheerfulness, seriousness and bad mood. As outlined, cheerfulness and bad mood have in common that they are affective concepts, although the valence of the former is positive and the valence of the latter negative, leading to a negative correlation between the two. As seriousness refers to a frame of mind, correlations should be weaker. The results show that cheerfulness, seriousness and bad mood, as both state and traits are homogeneous factors no matter how they were measured. Aggregated states measures were clearly connected with the respective traits and self-reported traits were moderate for aggregated states (total scores across the eight days) and lower for single measurements, as expected. Furthermore, strong evidence in favor of convergent (homologous scales correlated well) and discriminant (non-homologous scales were less correlated) validity of the STCI was observed. Finally, the expected pattern of correlations between the three dimensions was confirmed in the methods sampled and the peer-evaluation data provided support for the hypothesis that traits represent the dispositions for their respective states. The coefficients of the peer ratings were all significant, and for individual states only slightly lower than for the self-reports.

BEYOND THE STCI FOR GERMAN ADULTS: GENERATION OF INTERNATIONAL AND CHILDREN VERSIONS

Since the first publication of the STCI-T in 1996 and the STCI-S in 1997 [2,3] different versions of the state and trait questionnaires have been developed and translated into various languages, mainly basing on the international version of the STCI-T <106> and the STCI-S <30>. The procedure of adapting the questionnaire to English will be exemplified next, representing the process of all translations and adaptations.

The generation of the English pilot facet form [52] of the trait STCI took place in several steps. In step 1, all 106 items were translated into English (by one German, and one native English speaker, skilled in German too). Step 2 included a comparison of both translations, discussions about linguistic peculiarities and the content of several items and ended with a first translated item list (for some items alternative versions were kept). In step 3, the list was checked by two English-speaking humor experts familiar with the state-trait model. Their corrections were examined for their correspondence regarding the items' content and taken over to a large extent.

In a final step, the modified list was discussed with further English speaking researchers, resulting in the international version STCI-T<106>. The STCI-T<106> serves as the pilot version for adaptations in different cultures and languages. Table 1 shows the different versions available. The STCI exists in 13 languages, as presented in Table 1, and can be applied in various settings, with various versions for self and peer ratings (e.g., general peer rating, for parents, at the workplace). The psychometric characteristics of these adaptations are encouraging and the instruments typically yield comparable findings, regarding their psychometric characteristics and correlational patterns. Whereas most versions are tailored to adults, a children's version has recently been developed. Ruch and colleagues [53,54] adapted the STCI to children and youth aged 10-14 years.

Table 1. Overview of the different versions of the STCI-T and STCI-S

Version		Facet structure	Languages
Trait			
STHI-T <106>	self, peer	5 cheerfulness (38 items), 6 seriousness (37 items), 5 seriousness (31 items)	German, English
STHI-T <104>		5 cheerfulness (38 items), 6 seriousness (37 items), 5 seriousness (29 items)	Spanish
STHI-T <60>	self, peer, workplace	1 facet each (20 items each)	German, English, French (Québec), Polish, Hebrew, Chinese (Hong Kong), Spanish, Italian, Romanian. Underway: Slovene, Russian, Japanese
STHI-T <30>	self, peer	3 scales (10 items each)	German, English
STHI-T <30> children	self, peer, parent, teacher	3 scales (10 items each); 2 sub-clusters each	German, Spanish
State			
STHI-S <45i>			English
STHI-S <30>		3 scales (10 items each); sub-clusters English version: cheerful, hilarity, earnest, pensive, sober, sad, ill-humored	German, English
STHI-S <20>		3 scales (8 items for cheerfulness, 6 seriousness, 6 bad mood)	English
STHI-S <18>		3 scales (6 items each)	German, English, Hebrew
STHI-S <20> children	self, peer	3 scales (8 items for cheerfulness, 6 seriousness, 6 bad mood)	German

Note. Further information on the different versions and authors involved in translation and adaptation can be obtained from the authors.

After reformulating the items of the German standard STCI-T <60> and STCI-S <30> to a language adequate to children, their comprehensibility was checked by 10 kids aged 10-14 years. Next, the two pilot forms were filled in by 400 German speaking school children (age M = 12.04; SD = 1.37). To testing the sensitivity for mood changes and differences, the state versions were given in a control condition, as well as mood induction experiments with factual (giving scenarios) and actual induction of cheerfulness, seriousness and bad mood. Trait and state cheerfulness, seriousness and bad mood could be distinguished, but a simplified facet structure (two sub-clusters each) was adequate. The inter-correlations between the trait facets emerged as expected (CH to SE r = -.04; CH to BM r = -.36; BM to SE r = .12; [53]).

It needs to be considered that these correlations might be underestimated, as the reliabilities in the children's samples were lower as compared to the adults (due to the restricted variance in the sample). The correspondence between self- and peer-evaluations of traits turned out to be sufficiently high, ranging from r = .36 for trait bad mood to r = .41 for trait seriousness, and r = .47 for trait cheerfulness. To conclude, the overall psychometric characteristics of the scales proofed satisfactory (Cronbach's α ranged from .70 to .79 in the trait, and from .76 to .86 in the state version). The children's version was so far applied in a classroom setting and to investigating its relations to orientations to happiness [55] and life satisfaction [56] among Swiss school kids [57].

THE STATE-TRAIT MODEL OF CHEERFULNESS, SERIOUSNESS, AND BAD MOOD AND ITS RELATIONS TO HUMOR

The crucial question yet remains to be answered: Do the traits claimed to be the temperamental basis of humor indeed predict the sense of humor and humor behaviors sufficiently well? What behaviors, thoughts, and actions related to humor can the three temperamental traits forming the basis of humor actually predict? As they were designed to account for the inter- and intraindividual differences in the readiness to respond to humor with positive affect it is necessary to examine whether they actually do so.

Several studies have been carried out to test the model assumptions [3,15] and there are also studies examining the three traits in the context of the nomological net of humor variables. These studies involved predicting humor behavior in experiments by the three traits, the examination of the convergent validity (i.e., the correlation with other humor questionnaires), and the joint factor analysis of the STCI-T scales and other humor instruments.

Table 2 presents the main results of experiments that aimed at testing different model assumptions. The scope is restricted to results relating to trait cheerfulness. Results are only mentioned briefly. For more details the reader is referred to the original sources.

The results of the studies in Table 2 can be clustered in two categories: Experimental evidence dependent *or* independent of amusement/exhilaration eliciting stimuli. This distinction was undertaken because it was necessary to show that trait cheerfulness also predisposes individuals to more state cheerfulness without being linked to a stimulus. Only then it could be concluded to be a temperamental factor, tailoring individual's behavior independent of elicitors. Trait cheerfulness represents the disposition to both state

cheerfulness and exhilaration (smiling and laughter) irrespective of the eliciting condition or stimulus. As expected, trait cheerful individuals show more Duchenne displays in response to a clowning experimenter and to "bloopers" [37,59]. As cheerful individuals are extraverted [14] results might have been confounded with extraversion. It is known that extraverts smile and laugh more often than introverts, independent of stimuli. However, the smiles shown in the studies were not social smiles but involved the Duchenne display. To further exclude this possible sociability confound, exhilaration was elicited chemically (through inhalation of nitrous oxide, i.e., the "laughing gas") and individuals were tested in solitude.

Table 2. State and trait cheerfulness and the experimental induction of exhilaration and cheerful mood

Individuals high in trait cheerfulness ...
... laugh more often and have higher increases in state cheerfulness after inhaling nitrous oxide [18]
... have higher rises in state cheerfulness after consuming kava extract [58]
... show more smiling and laughter (higher contraction of the zygomatic major muscle) when looking at video clips of simple news or news speaker's slips of the tongues [59]
... show facial signs of exhilaration more frequent and intense, when interacting with a clowning experimenter for 10 minutes [37]
... display higher increases in cheerfulness after listening to funny tapes (in comparisons to tapes containing neutral contents [37]
… report less need for structure [60]
… display BOLD activation in the inferior parietal lobule of the right hemisphere. This might be associated with a general readiness/tendency to be amused by jokes. Regions previously shown to be activated in humor appreciation studies seem more likely to be related to the understanding of individual jokes and the momentary emotion and the momentary emotional reaction of exhilaration [61]

In a psychpharmacological experiment, Ruch and Stevens [18] found that trait cheerfulness moderated the impact of nitrous oxide on state-cheerfulness, compared to placebo (inhaling pure oxygen) and baseline measures. The latter two did not differ from each other, indicating that the placebo control was successful. No mood-enhancing effect could be observed for low trait cheerful individuals. Trait cheerful individuals also smiled and laughed more often after inhaling nitrous oxide. Conversely, low trait cheerful individuals did not experience exhilaration; they just felt the numbing effect of nitrous oxide. In this respect, a definite neurological reaction could be seen in the high trait cheerful individuals that made them experience more exhilaration. A first fMRI study suggested involvement of brain structures sensitive to differences in trait cheerfulness [61]. Thus, trait cheerfulness indeed seems to predispose people to react more readily with smiling, laughter, and exhilaration/amusement; without it being tied to a humor stimulus. Similar effects were found for kava-kava extract; cheerful individuals had a higher increase in state cheerfulness indicating that trait cheerfulness moderates the drug-induced increase in cheerful mood [58]. Further, Table 2 confirms that state cheerfulness is a predictor of smiling and laughter. Ruch [35] reported that participants in a cheerful mood showed facial responses of exhilaration to

cartoons and jokes at lower minimal levels of rated funniness than did less cheerful subjects. This implies that subjects high or low in cheerfulness differed with respect to the frequency and intensity of facial behavior shown, but not in terms of their judgments of funniness. This phenomenon was labeled facial hyper-expressivity [35]. State cheerfulness also predicted the frequency and intensity of exhilation, and, in turn, the intensity and duration of laughter then predicted the raise in state cheerfulness [37]. This confirms the reciprocal relationship between state cheerfulness and exhilaration. However, no study has been done yet to show that there is an upward spiral of cheerful mood facilitating smiling and laughter, that, in turn, boosts a cheerful state.

Further, there is evidence that state cheerfulness is a moderator of elicitors of smiling and laughter. A laughing experimenter [37] is only contagious for individuals that are already in a cheerful mood but not for ones that are not. Similarly, EMG-recorded smiling in response to jokes and cartoons is enhanced by mere presence (i.e., the mere presence of an else passive person) only for individuals in a cheerful state [32]. Robustness of cheerful mood, or "keeping humor," is a further parameter in the relationship between state and trait cheerfulness that deserves separate attention. Trait cheerfulness not only predicts the threshold for the induction of a cheerful mood state, its intensity and duration, but also the resistance against worsening of the mood. It was postulated and found in a rating study that it takes more adverse stimuli to impair the cheerful mood among trait cheerful individuals compared to the low cheerful ones [15]. The results of subsequent experiments are summarized in Table 3. Table 3 shows that trait cheerfulness is also a predictor of robustness of cheerful mood. In a variety of settings, individuals high in trait cheerfulness (especially in facet CH3 "cheerful composure") maintained their good mood when facing adversity but low trait cheerful individuals did not. In some of these studies the adverse situation was generated quite unobtrusively; for example, by placing the participants in a depressing room (vs. cheerful room) with poor illumination, black walls, a dried out plant on the table and a pessimistic poster on the wall facing the participant [15] or asking participants to explain misanthropic (vs. cheerful) proverbs [62]. These studies confirm that trait cheerfulness represents the tendency to maintain in cheerful mood, even when facing adversity. Their cheerful mood is more robust against inductions of negative mood and emotions. However, no study was conducted so far that actually tested the limits of trait cheerful people.

Table 3. Trait cheerfulness and robustness of cheerful mood

Trait cheerful individuals
… stay in a cheerful mood when having to elaborate proverbs with negative, misanthropic contents [62]
… show more smiling and laughter when being confronted with one's own grimaced face unexpectedly [63]
… keep a cheerful state, even when having to sit in a depressing room while working on several tasks [15]
… show more Duchenne smiling in response to seeing distorted photographs of themselves [64,65]
… report more positive emotions and less negative emotions when confronted with a distorted photograph of themselves [65]

When trait cheerful individuals keep humor in face of adversity, are they also able to laugh at themselves? Recently, an experimental paradigm for the study of "laughing at oneself" was developed [65,66]. The Distorted Photograph Task (DPT; [66]) is a computer based task aimed at eliciting situations where laughing at oneself is possible. First, a cover story is told to participants, which justified the taking of photos of the participant's face. Then these photos are electronically distorted (e.g., flattening or bowing the face) without the knowledge of the participant. In the main part of the experiment, the participants are instructed to look at 12 distorted photographs on a computer screen and to rate the degree of appreciation (funniness and aversiveness), unaware that their own photographs had been inserted into the presented series. The photos are presented randomly and the participants are unexpectedly confronted with their own distorted photo. During this task, participants are alone in a room [62] and secretly filmed and the facial responses are FACS-coded. As expected, trait cheerfulness predicts the level of positive affect (and of low negative affect) when people either laugh at themselves rather than being upset. In detail, trait cheerful individuals found their own distorted photographs funnier and reported more positive emotions (e.g., joy and serenity) and less negative emotions (e.g., discomfort, anger, fear) than low trait cheerful individuals. Furthermore, they showed more intense Duchenne smiling and laughter and reported a higher increase in state cheerfulness and a stronger decrease in state seriousness from before to after the experiment. Also, low trait bad mood individuals reported high degrees of negative emotions when looking at their distorted photograph and less positive emotions than high trait bad mood individuals [65]. Thus, trait cheerful individuals can deal with being the butt of a joke and even see the positive side of it. This ability to distance oneself from being the target of a joke, or experiencing an embarrassing situation or mishap, can actually help to gain perspectives and overcome negative feelings [44]. By laughing at the mishap or the joke, one has taken the first step in mastering the situation.

In a conceptually related study [64] participants were instructed to pose different facial expressions (among them also a silly face) and then visual feedback was given. Although laughing at oneself was not explicitly investigated, it was shown that more smiling and laughter occurred in high trait cheerful individuals when being confronted with one's own grimaced face unexpectedly. Also, habitually cheerful individuals reported no decrease in cheerful mood while low the trait cheerful did.

Taken together, trait cheerfulness represents a disposition for exhilaration and the induction and robustness of cheerful mood. In this sense, trait cheerfulness underlies humor, as typically in everyday conversations a "good sense of humor" would be used to explain these behaviors to occur in some people but not in others. While this is good support it should be mentioned that this is not unique to trait cheerfulness, as extraversion has also been shown to predict frequency and intensity of humor-induced smiling and laughter [8,12]. Hence, one might argue that trait cheerfulness is a redundant concept. Therefore, extraversion was examined in most of these studies as well and its predictive power typically turned out to be lower than the one for trait cheerfulness [37]. Likewise, the predictive power of state cheerfulness compared to the one of more general mood states, such as elation or positive affectivity, was controlled in two studies [32]. It turned out that an index of cheerful mood was a better predictor compared to all scales of positive mood used. Thus, state and trait cheerfulness are superior in accounting for humor induced positive affect than more general personality traits and broader mood states, respectively.

If trait cheerfulness predicts humor behavior in experiments (i.e., a single situation), it should also predict humor related habits, as typically reported in humor questionnaires. Above, selected humor behaviors were studied that stem from the state-trait theory of cheerfulness. Trait conceptualizations of humor, such as the "sense of humor" often draw on those behaviors (such as being able to laugh at oneself) and hence an overlap between sense of humor and trait cheerfulness can be expected.

However, humor is a multifaceted phenomenon and there will be aspects of humor that are not based to trait cheerfulness (e.g., ridiculing others, having a "dry wit", or liking bathroom humor). The STCI was administered together with many humor questionnaires and the results are given in Table 4. Furthermore, when a broad selection of humor instruments was administered a joint factor analysis was performed to see where cheerfulness (and seriousness and bad mood) is in the factor space derived.

Table 4 confirms that trait cheerfulness predicts most facets of sense of humor conceptualized, like *coping humor* (measured by the Situational Humor Response Questionnaire, SHRQ, [11]; or the Coping Humor Scale, CHS, [71]), *humor styles* (measured by the Humor Styles Questionnaire, HSQ, [67]), the *facets of the sense of humor* (Sense of Humor Scale, SHS, McGhee, [10,44]), and *styles of everyday humor conduct* (e.g., Humorous Behavior Q-Sort Deck, HBQD, [72]; and the Humor Use in Multiple Ongoing Relationships, HUMOR, [73]), as well as various other models [42].

Ruch and colleagues [43] investigated the relationship between the trait cheerfulness, bad mood and seriousness on the one hand, and humor styles and uses of humor on the other. The HSQ [67] claims to measure potentially adaptive and maladaptive styles of humor in four distinct dimensions, namely affiliative, self-enhancing, aggressive, and self-defeating humor. Styles of everyday humor conduct were assessed by the HBQD [9,71] which measures 10 styles located along five bipolar dimensions: socially warm vs. cool, reflective vs. boorish, competent vs. inept, earthy vs. restrained, and benign vs. mean-spirited humor. The STCI-T traits predicted the contents of the HSQ and the HBQD well: Trait cheerfulness was strongly correlated with the socially warm, affiliative, self-enhancing humor style and use of humor in everyday life, and was also predictive of competent, earthy, and self-defeating humor. The HSQ concept of affiliative humor refers to the tendency to joke around with others, say witty things, tell amusing stories, laugh with others, and amuse others. In this sense it strongly resembles facet CH5 (a generally cheerful interaction style) of trait cheerfulness. Indeed, trait cheerfulness was a very potent predictor of affiliative humor (r = .69, p <.001) and CH5 was the facets that correlated almost interchangeably with affiliative humor (r = .80, p <.001). The self-enhancing humor scale contains items relating to perspective-taking humor, the tendency to maintain a humorous outlook on life, and the use of humor in emotion regulation and coping and thus also overlaps with facet CH3 (a composed view of adverse life circumstances) of trait cheerfulness. Indeed, trait cheerfulness predicted self-enhancing humor (r = .58, p <.001) and both CH3 (β = .24) and CH4 (β = .44) predicted self-enhancing humor in a step-wise regression analysis (R = .65, F(2,165) = 55.667, p <.001). The items of the aggressive humor scale relate to sarcasm, teasing, use of humor to criticize or manipulate others, and compulsive expressions of humor without regard for the effects on others. This sounds perhaps a bit too serious as, after all, it is a playful expression of aggression. Indeed the "aggressive" humor style mostly indicated lack of seriousness: Low trait seriousness was involved in the prediction of socially cold, earthy and repressed humor styles, and in affiliative (r = -.45, p <.001), self-enhancing and aggressive humor (r = -.34, p <.001).

Finally, self-defeating humor comprises tendencies to use humor in an excessively self-disparaging and ingratiating way, to allow oneself to be the butt of others' jokes, and to use humor as a form of defensive denial to hide underlying negative feelings. Trait bad mood was a potent predictor of the socially cold and inept humor styles and was negatively correlated with benign, earthy, affiliative and self-enhancing humor styles, as well as having incremental validity in the prediction of self-defeating humor.

The study also investigated the HUMOR [72], which highly correlated with trait seriousness (r = -.54, p <.001) and with cheerfulness (r = .45, p <.001). Some items correlated more highly with trait cheerfulness (e.g., "I laugh at TV or radio programs that I think are funny"), but more individual items were primarily representing low seriousness (e.g., "I laugh about upsetting things that have happened to me"). Taken together, these results support the view that traits forming the temperamental basis of humor are able to predict everyday humorous behavior. They demonstrate their utility as a valid alternative to the folk concept of the sense of humor.

Several studies applied factor analyses to the intercorrelation of the STCI and a variety of self-report humor instruments. Generally, studies repeatedly resulted in factors related to cheerfulness and (low) seriousness (e.g., [8,42]), but also bad mood [52].

Table 4. Correlations between trait cheerfulness and various measures of the sense of humor

High trait cheerful individuals…
... are higher in socially warm, competent, earthy humor of the HBQD [4]
... are higher in affiliative and self-enhancing humor styles, report less self-defeating humor of the HSQ [4,67]
... score higher on all to the sense of humor facets measured by the SHS [52,68]
... report more humor behavior [4]
… report using humor as a coping strategy [69]
… report less fear of being laughed at (gelotophobia, e.g., Ruch and Proyer [70]), and report more gelotophilia, the joy of being laughed at [65]

For example, Ruch and Carrell [52] assessed the STCI and the facets of the sense of humor as proposed by McGhee and measured by the SHS [10,44] in two samples (American and German). The SHS assesses eight facets of the sense of humor (e.g., finding humor in everyday life, using humor under stress), which are related to McGhee's humor training program. The Scree test of the joint factor analysis of the subscales of the SHS and STCI-T suggested in both samples the retention of three factors (explained variance US: 64.5%; German: 61.1%). Factor 1 (cheerfulness/sense of humor) was loaded by the SHS scales and the facets of trait cheerfulness. Thus, this factor merged elements like enjoying humorous stimuli (SHS-1, STCI-T CH4), enjoying cheerful interactions (STCI-T H5) and telling jokes (SHS-5), finding humor in everyday life (SHS-6) and in one's own mishaps (SHS-7), a tendency to laugh (SHS-4, STCI-T CH2), prevalence of cheerful mood (STCI-T, CH1), and the use of humor under stress (SHS-8). Factor 2 (seriousness) and 3 (bad mood) was loaded by the respective facets in the STCI-T and the scales of the SHS (SHS-2: seriousness and negative mood, and SHS-3: playfulness and positive mood) and were negatively correlated with the factor of cheerfulness/sense of humor.

The discussed studies typically report that trait cheerfulness accounts for most variance in sense of humor assessment tools. However, these findings [43,52] can be criticized to largely overestimate the role of cheerfulness in "the sense of humor". This is due to the fact that the recent conceptualizations of the sense of humor give too much weight to the affective-expressive and social qualities, and hence, there is much conceptual overlap with cheerfulness. Thus, it is no surprise that cheerfulness predicts humor operationalized via its affective and behavioral qualities. A sense of humor conceptualized as an attitude or worldview should not be so strongly related to affect, thus leaving room for additional, moderating variables to be involved [15,43,52]. Indeed, being able to laugh at oneself (a core facet of the sense of humor) correlated to r = .50 with trait cheerfulness. Two seriousness facets had incremental validity: SE5 entered the regression equation with a negative and SE2 with a positive weight [52]. Thus, 'laughing at oneself' is highest among those cheerful individuals who do face things seriously, but also communicate humorously.

STCI AND HEALTH AND WELL-BEING OUTCOME VARIABLES

Many promoters of humor and also researchers claim that humor and laughter are beneficial to health and well-being, although empirical evidence is still scarce [31]. The lack of accumulative research in this area is due to many reasons. One is that too little time and effort has been spend on building solid foundations for applied research. For example, if one assumes that laughter is relaxing, does this apply to all types of laughs? Obviously, the question of how many types of laughter exist needs to be solved first before we ask whether they would all be beneficial. Likewise, humor research has spent way too little effort in working on solid conceptualizations of the sense of humor, but rushed into looking whether they are beneficial or detrimental. As a consequence, research knowledge is a bit of a patchwork, rather than a solid field of knowledge. In the present chapter it was decided to present findings on trait cheerfulness only, as it overlaps greatly with many other conceptualizations of the sense of humor.

Generally speaking, health is not solely the absence of negative affect and physical symptoms, but a "*complex state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"* [74: 100]. Well-being is a complex construct that concerns optimal experience and functioning (e.g., [75,76]). Ryan and Deci [76] claim that well-being is derived from two general perspectives: The first one is the hedonic approach, which focuses on happiness and defines well-being in terms of pleasure attainment and pain avoidance. The second one is the eudamonic approach, which focuses on meaning and self-realization and defines well-being in terms of the degree to which a person is fully-functioning. Seligman [77] presented three basic orientations to happiness, namely life of pleasure (i.e., hedonism), life of engagement, and life of meaning (relating to eudemonia) and indeed all three were found to happiness [55]. Recently, Seligman [78] has redefined what constitutes human's thriving in life and this brought a shift from life satisfaction to *flourishing*. Flourishing goes beyond being happy with one's life and life circumstances and constitutes five elements. Flourishing includes human's needs to find meaning, achievement and being engaged too. Flourishing can be reached through a combination of *p*ositive experience/emotions, *e*ngagement, *r*elationships to others, *m*eaning and *a*ccomplishment,

leading to well-being and summed under the acronym *PERMA* (see Seligman, [78]). Seligman [78] reports less health problems and more productivity for flourishing individuals. In the next sections, the relations of trait cheerfulness to health, life satisfaction and the relevant elements of PERMA will be discussed.

HEALTH

Good health and well-being relate to satisfaction with life. Life satisfaction gained much attention in research during the past decades, mostly due to the growing interest in Positive Psychology [55]. Correlations between cheerfulness and life satisfaction were established for both adults [43,79] and children [54] reporting that trait cheerful individuals are more satisfied with their lives.

Table 5 brings together further relevant findings on trait cheerfulness and its relation to health variables. Zweyer, Velker and Ruch [80] reported higher pain tolerance (in the cold pressure test) for trait cheerful individuals. This occurred after watching a funny film and producing humor to it, or smiling and laughing voluntarily at it. The moderating effect of exhilaration and trait cheerfulness on pain perception should be considered, for example in post-operative care. Milder pain killers might be partly substituted by exhilaration (e.g., through humor interventions, hospital clowns etc.), leading to less cost and physical and psychological side effects.

Also, stress causes physiological reactions, and maladaptive strategies dealing with stress can decrease health [81,82]. Coping can be defined as dealing with a negative situation and its feelings in different ways [83,84]. Adaptive coping is an important variable in dealing with stressful life events, overcoming problems, and in a long-term perspective life satisfaction. In 2004, Diener and Seligman [75] found adaptive coping to be positively related to life satisfaction. Ruch and Zweyer [69] showed that trait cheerful individuals use more constructive and adaptive stress coping mechanisms (e.g., positive self-instruction, relaxation) as measured by the SVF 120 [6]. Especially the facet "cheerful composure" (i.e., CH3) predicted positive coping strategies. Furthermore, for habitually cheerful individuals, state cheerfulness stays high, and no more physical symptoms were reported in retrospect, even when having faced negative life events and stress [15,69].

As seen in the study of Ruch and Carrell [52], trait cheerfulness predicts various facets of the sense of humor in the model of McGhee. Interestingly, some of McGhee's facets are closely related to *coping*, namely the facet humor under stress and laughing at oneself. McGhee [88] views the sense of humor as an accumulation of facets, which can be trained and fostered to contribute to stress-resistance and resilience. Displaying a cheerfully composed view on life can help mastering difficult life-events and negative mental states. As trait cheerfulness accounted for most variance in the SHS, it can be concluded that cheerfulness plays a crucial role in humor facets related to coping too.

Hehlmann [89] stated that a humorous worldview is a sign of human maturity, an attitude akin to wisdom, and developed on prior suffering, pain, and exposure to an imperfect world. Applying this to a more clinical focus, it can be concluded that the humorous world view enables what clinicians would call "post-traumatic growth" [77,90,91]. While some

individuals response to tragedy with depression, PTSD, rumination and learned helplessness, others actually take something away from it: they grow in response to the tragedy.

Table 5. Experimental and correlational evidence to trait cheerfulness and health and well-being outcome variables

Individuals high in trait cheerfulness…
Health
Physical
… report higher state cheerfulness, and no more physical symptoms, even when facing negative life events and stress [15,69,85,86]
… have a higher pain tolerance (in the cold pressure test) after watching a funny film and producing humor to it, or smiling and laughing voluntarily at it [80]
Mental/Robustness of mood (see also Table 3)
… report using humor as a coping strategy [69]
… use more constructive and adaptive stress coping mechanisms, like positive self-instruction and relaxation [69]
Well-being: Person Factors
… experience more positive affect and report less negative affect [42]
… report more quality of life [79]
… report more life satisfaction [45]
… score lower in neuroticism, higher on extraversion, and higher on agreeableness [8,15,36,87]
… score lower on Eysenck's psychoticism [87]
… report less fear of being laughed at (gelotophobia, e.g., [70], and report more gelotophilia, the joy of being laughed at [65]
… report higher need for play, affiliation, exhibition, dominance and nurturance [42]
Well-being: Social
… Highly trait cheerful are emotionally intelligent and possess high interpersonal competence [87]
… High trait cheerful experience more social closeness [14]

Notably, the maintaining a cheerful outlook on life and not loosing humor in the face of adversity refers to the robustness of mood postulate of the facet model. This cheerful outlook is different from the view of humor as a coping strategy [92]. Such as trait cheerfulness is the *underlying* trait and better coping the overt behavior shown, not the mechanism behind. Furthermore, the facets CH2 (low threshold for smiling and laughter) and CH4 (having a broad range of active elicitors of cheerfulness, smiling and laughter) may explain possible relations between cheerfulness and stress, as stress reactivity studies have shown that smiling through stressful tasks in the laboratory lead to faster recovery. Also, the decrease of positive affect was smaller throughout the whole experimental session in participants showing smiles. Therefore, trait cheerful individuals who can laugh and smile easily also do this when completing stressful tasks in an experimental setting and consequently recover faster.

POSITIVE EXPERIENCE (PERMA) AND LIFE OF PLEASURE (AUTHENTIC HAPPINESS)

The most obvious relation between trait cheerfulness and well-being is found in the fact that cheerfulness facilitates positive experiences (like state cheerfulness, exhilaration) and prevents negative experience (i.e, the "keeping humor", or "robustness of positive mood" effect). Where as the former part is most purely incorporated in the positive experience element of PERMA, the combination of both (presence of positive and absence of negative affect) is an element of the life of pleasure, one element of authentic happiness. Indeed, like humor, trait cheerfulness is significantly correlated with all three orientations to happiness. However, it is more highly correlated to life of pleasure than to engagement and meaning in both children and adults [4,43,54]. The life of pleasure, as an orientation to happiness relates to the principle of maximizing pleasure and minimizing pain, again relating to establishing positive feelings and avoiding negative.

Meehl [93] developed the concept of *hedonic capacity*. Hedonic capacity is a disposition, which is (to different degrees) inherent in all individuals, enabling the experience of positive affect. This accumulation of positive affect directly contributes to well-being. This converges with the view that trait cheerfulness is a habitual trait fostering positive experience. The hilarity component of cheerfulness (e.g., facet CH2: *low threshold for smiling and laughter*) might be the ones representing the induction of positive affect and the cheerful composedness component (e.g., CH3: a *composed view of adverse life circumstances*) represents the tendency to be immune negative states and more quickly overcome them [2,15].

Experimental evidence for these two effects have already been given in Tables 2 and 3. Moreover, Köhler and Ruch [42] report that high trait cheerful individuals experience more positive affect and report less negative affect as measured by the Positive Affect Negative Affect Scale (PANAS [94]). Trait cheerful individuals have the ability to laugh at themselves and therefore overcome aversive situations and happenings more easily [66]. While the results presented suggest that trait cheerfulness entails *resilience* against the induction of negative affect, it has to be said that higher levels of adversity have not been studied so far. It is safe to assume that trait cheerful individuals will eventually get grumpy and grouchy when being confronted with highly adverse circumstances. Generally, distal effects of being more resilient to negative events might be the rare occurrence of the health effects of predominant negative affect. Hence fostering the appearance of exhilaration may help to mitigate, suppress, interrupt, or even permanently replace a variety of negative states [13].

TRAIT CHEERFULNESS AND RELATIONSHIPS TO OTHERS

Trait cheerfulness not only represents a disposition to positive mood, it incorporates the sharing of fun with others. This is expressed most clearly in facet CH5 ("a generally cheerful interaction style"). Cheerfulness enables individuals to engage easily in playful and cheerful interactions and therefore fosters interpersonal bonds. This may not be the core element of positive relationship with others and relations based on shred fun might miss important elements. However, laughter has been seen as a social lubricant and as such it will help the individual to establish relationships (everything else held constant). Persons scoring high in

cheerfulness report to be more satisfied with their lives compared to less cheerful people. This may be due to their ability to initiate humorous behavior in social situations, larger social networks and better-developed social skills. Trait cheerfulness generally goes along with a cheerful interaction style, and perceived social closeness [14]. Consequently, it could be leading to a higher level of social support. Yip and Martin [95] showed that trait cheerful individuals generally scored higher in an ability test for emotional intelligence (measured by the Mayer-Savoley-Caruso Emotional Intelligence Scale; MSCEIT [96]) and possess high interpersonal competence: They initiate relationships more easily, disclose personal information to significant others, provide emotional support to others, and manage conflicts in relationships constructive [95]. Last but not least, research on cheerfulness and domain specific satisfaction among children has shown that trait cheerfulness relates most strongly to satisfaction with friends (compared to family, self, or school) [53].

CHEERFULNESS, ENGAGEMENT AND MEANING

Research on adults and children have shown that trait cheerfulness, like humor, correlates modestly and positively with meaning and engagement; i.e., the more potent predictors of enduring happiness (compared to the life of pleasure). The meaningful life suggests that happiness can be achieved by using ones skills and talents in the service of greater goods. Cheerfulness contributes to life of meaning, as maintaining a positive view on the world, even when facing adversities may help seeing the meaning in life-events.

The engaged life is influenced by Csikszentmihalyi's works on flow. Life of engagement is supported by state and trait cheerfulness, as cheerful individuals don't get grumpy or sad easily and may be able to quest for their aims and goals longer. Although the concept of flow is not an affective one, Csikszentmihalyi [97] did claim that positive moods do usually occur after getting out of flow, at the end of an activity or in moments of distraction within it.

Accomplishment, the last element of PERMA will not be related to cheerfulness, but to seriousness. Trait seriousness predicts several accomplishment-related variables [14] including satisfaction with school experiences. Trait seriousness, together with cheerfulness, has been seen as an element in a more profound, philosophical sense of humor.

FURTHER RELATIONS

In even broader terms, cheerfulness is related to extraversion and emotional stability (low neuroticism, see [8,15,87,97]). For extraversion and neuroticism, it was found that the former is positively correlated to well-being, whereas the later is negatively related to it (e.g., [98,99]).

Furthermore, trait cheerful individuals report less fear of being laughed at and ridiculed by others (gelotophobia, the fear of being laughed at; [70]) and more gelotophilia (the joy of being laughed at [100]). This indicates that they are generally easy going in laughter and humor related situations. They can deal with being the butt of a joke and even enjoying this. This is in turn likely to be beneficial in establishing and maintaining friendships and acquaintances, for example in leisure or at the work place.

INTERVENTIONS TO ENHANCING CHEERFULNESS

Scientifically grounded training programs were established and empirically evaluated to enhance cheerfulness [48,88,101]. Brutsche and colleagues [102] showed that state cheerfulness significantly increased after humor interventions with a clown in severe refractory chronic obstructive pulmonary disease patients (COPD) and they also observed a reduction in hyperinflation. Papousek and Schulter [101] discuss that enhancing cheerfulness may improve coping with future adversities, which may promote enhancement of psychological well-being. Their cheerfulness training follows a behavioral therapy approach. The core of the training program is to learn and practice a technique to efficiently self-induce cheerful moods. This entails the imagination and voluntary production of motor and vocal expressions of cheerfulness. The authors assumed that voluntary expressions of emotions can trigger genuine feelings of these emotions (e.g., [21]). By repeating the newly learned behaviors, imaginations of subjective weaknesses and unpleasant situations are coupled with the positive moods through conditioning mechanisms. A fundamental postulate of the training is, that participants actively practice to self-induce cheerful moods, instead of just passively appreciating an instructor's jokes or humorous material. It is expected that imaginations of adversities and later real situations, automatically trigger a cheerful mood after having undergone the training. Results indicated enhanced cheerfulness levels due to the training program [100]. Mood changes were not only present during or shortly after the training sessions, but also two days after the training period, without further emotional stimulation. There was also a more general improvement of psychological well-being (more good-humored, calm, fresh, and less anxious mood). Feelings of stress and tenseness were reduced.

Hirsch and colleagues [48,49] evaluated humor therapy groups in elderly depressed patients in residential care settings. Two groups were formed. The control group participated the therapeutic program as usual. The other group attended group humor therapy session twice a week, on top of the usual range of activities. Both group's depression scores, suicidal tendency, life satisfaction, subjective general health and state cheerfulness improved over time, as well as state bad mood decreased. This shows that the general therapeutic program helped all the patients. On top of that, the humor therapy led to improvement in resilience, trait cheerfulness and a decrease in state seriousness. Here, an interaction effect was found: State seriousness decreased in both groups, but more so in the humor therapy group. Most importantly, in a yet unpublished study individuals underwent a training of the sense of humor based on the model by McGhee [10]. Not only sense of humor increased, but even more so trait cheerfulness, while trait seriousness and bad mood decreased. This confirms how closely sense of humor and trait cheerfulness, seriousness and bad mood are interconnected [88].

CONCLUSION

The results, obtained so far, provide evidence that cheerfulness, seriousness, and bad mood as states and traits are relevant to the study of humor. They account for a variety of phenomena, such as appreciation of types of humor, wit, keeping or losing humor when facing adversity, or readiness for exhilaration and laughter. There is also support for the view

that these more narrow concepts are better predictors of humor phenomena than global personality concepts (like extraversion). To conclude, a few open questions for further research should be addressed. One issue is to study the state-trait model of cheerfulness in relation to other areas of humor not covered so far. For example, Schmidt-Hidding [103] summarized that humor (in the narrow sense) was based on a sympathetic heart, while wit would be based on a superior spirit, and mock/ridicule on moral sense or even haughtiness/maliciousness. Schmidt-Hidding [103] considered fun to be an expression of vitality/high spirits. Trait cheerfulness relates to the fun and humor parts of his model, but will be blind to others or need to be supplemented by others. For example, low seriousness is a predictor of wit, but the literature showed that the ability to create humor is primarily correlated with intelligence and creativity [104]. Here, the combined effects should be studied. Likewise, bad mood (and low seriousness) predicted scores in the comic styles of satire, cynicism, and sarcasm [105] but it does not account for much of the variance. Furthermore, longitudinal studies and studies that consider moderating and enabling factors are needed. The historic literature assigned cheerfulness a special role in the development of humor in the narrow sense. It was suggested that a humorous attitude or worldview is the product of a cheerful temperament and certain enabling factors, like negative life experiences and acquired insights into the human nature and human existence [39]. A person with a humorous attitude is someone who understands the insufficiencies and shortcomings of life and fellow humans but also tolerates and forgives them. In this sense, humor is considered to be serious and contains the wisdom that nothing earthly and human is perfect. In this respect, humor is different from merriment or hilarity. The former is contemplative, pensive, and profound, the latter thoughtless, superficial, and shallow. In a partial support of this hypothesis, Ruch and Carrell [52] found a mid-size correlation between trait cheerfulness and a questionnaire measure of ”laughing at yourself” with components of seriousness showing incremental validity in predicting this indicator of humor in the more narrow sense. However, the total score of the SHS [10,44] and trait cheerfulness were almost indistinguishable. Similarly, in a study of temperamental predictors of comic styles it turned out that trait cheerfulness was positively related to humor (in the narrow sense), but also fun and nonsense [106]. Thus, the nature of the preferred comic style is based on one’s prevalent mood. However, more studies are needed for proving that at least two factors are necessary for a humorous attitude to develop - a cheerful temperament and prior successfully mastered adverse life experiences. Thus, at best, a longitudinal study were trait cheerfulness is assessed prior to the life events (so that it is not itself affected by them) and humor is assessed after these life events should be conducted. Until now, the positive effects of cheerfulness were reported. But Friedman and colleagues [107] even reported a negative relationship between their factor cheerfulness/optimism in childhood and longevity when investigating participants of the Tearman life cycle study. They found (by applying factor analysis) cheerfulness consisting of two items: cheerfulness/optimism and sense of humor. This factor went along with earlier deaths. Martin and colleagues [108] reanalyzed these data trying to find the specific moderators of this correlation, but could not explain the relation of cheerfulness to earlier deaths via more risk behavior and such. Nevertheless, it seems important to also to consider potential negative effects of cheerfulness.

McNulty and Fincham [109] consider traits which contribute to well-being not as inherently positive. As Schwartz and Sharpe [110] already stated, the context is of utmost importance. It was suggested that well-being is not solely determined by certain

psychological characteristics, but by the interplay between those characteristics and environmental factors of the person. The research further suggests that certain circumstances may lead to a decrease in life satisfaction, well-being and increase in maladaptive behaviors, when using so called beneficial traits in the wrong context or to the wrong extent (see e.g., the example of forgiveness; [111]). For example optimism can lead to an optimistic bias [112], where people underestimate health risks and miss on getting regular check-ups at the doctor's. According to McNulty and Fincham [109], three factors should be considered when fostering positive traits: It should be studied when, to whom, and to what extend well-being can be promoted, instead of examining the main effects of traits and processes on average. In the case of trait cheerfulness, coaches would need to consider that trait cheerful individuals respond differently compared to non-trait cheerful individuals when being confronted with a cheerfulness intervention. Maybe these interventions would need to look different for either high or low trait cheerful individuals, because there should be a fit between the individuals' habitual dispositions and the training offered. For example, it might be more suitable to start with less intense stimuli in low trait cheerful individuals, as not to overwhelm them. Consequently prolonging the training may help, as low trait cheerful individuals might need longer to get their cheerfulness heightened and may profit from a less intense, gradual approach. High trait cheerful individuals are easily brought into a cheerful state and that is why they might like engaging in cheerful evoking interventions more often and easily. They might also not need long interventions, as they have an inherent capacity for establishing and maintaining cheerful states. Perhaps they only need some training on polishing their cheerfulness skills. This links to the notion, whether it is possible to have too much cheerfulness. Especially the combination of high cheerfulness and low seriousness should be discussed. Somebody highly cheerful and not serious at all might find it difficult to engage in any sober and practical thinking. Then, it might be adequate to train these people in when to moderate their cheerfulness in order to concentrate on problem solving and all-day tasks. Or maybe high trait cheerful individuals would find it difficult to emphasize with somebody who cannot get him-or herself out of a grumpy or sad mood (e.g., clinically depressed individuals).

It is questionable whether high trait cheerful individuals need training at all. Going back to McNulty and Fincham [109], their next consideration states that psychological concepts need to be studied in the context of happy and unhappy people. Perhaps some traits benefit people in optimal circumstances, but can harm people in suboptimal circumstance; for example being more suitable for people in therapy. Then, approaches like the one Papousek and Schulter [101] used could be applied to the therapy of clinically depressed persons [113]. To conclude, as trait cheerful people generally experience more cheerful and happy moods, they might not need to be trained.

Thinking of evaluation studies, one should consider the matching of the control and intervention groups according to their cheerfulness levels. Responses to cheerfulness trainings might be different for low and high trait cheerful, independent from its relative success for the groups. When measuring for example facial displays of amusement and joy, one will find that cheerful individuals smile more easily, and more often. Therefore, it might be that low trait cheerful individuals already enjoy something, but not express this facially yet. Finally, implications of psychological characteristics should be studied over a long period of time. So far, it is not known whether short term benefits (which are most often investigated in positive intervention studies so far) do remain stable for medium or long time frames, or whether their quality changes. The same is true for the cheerfulness interventions conducted so far. Most of

these thoughts discussed remain assumptions. The effects of cheerfulness and its training on individuals needs further consideration and research and also Friedman and colleagues' [107] counter-intuitive finding of cheerful individuals living shorter needs explaining. While the direct pathways of cheerfulness to the life of pleasure and hedonic well-being were discussed, it remains unclear how cheerfulness could relate to the other pathways, the life of engagement and the life of meaning, as well as the eudamonic well-being, which focuses on meaning and self-realization and defines well-being in terms of the degree to which a person is fully-functioning [76]. Studies focusing on these more complex relations would help finding out how cheerfulness can support people in reaching their full potential and finally bringing more light in the relation of the temperamental basis of humor to health and well-being. "*A laugh a day keeps the doctor away*" might not be as easily proven, but the results found so far are promising need continuation.

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