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Humor Styles and Their Relation to Creativity – About
the Mediating Role of Affect

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Abstract

Humor and creativity are highly valued in the workplace due to their numerous benefits for employees and organizations. Though past research addressed the relationship between humor and creativity, this study is the first to examine the relationship between four humor styles and creativity, and affect as mediator variable. Participants were 165 students, who filled out a questionnaire including the short work-related Humor Styles Questionnaire, the Positive and Negative Affect Schedule, and three tasks on verbal creativity. Results showed that none of the four humor styles were directly related to creativity, whereas the self-defeating humor style had an indirect effect on three indicators of creativity (i.e., fluency, appropriateness, flexibility) through negative affect. This is in line with the persistence pathway of the dual pathway to creativity model, assuming that negative affect can enhance creativity because of increased perseverance. The self-enhancing humor style was positively correlated to positive affect, but positive affect in contrast to negative affect was not found to be related to creativity. Future research should investigate the role of task motivation in the relationship between affect and creativity.

Keywords: humor styles, creativity, affect, dual pathway to creativity model

Dealing with the concept of humor reflects the spirit of the time and is in line with the ongoing attention to the approach of positive psychology, which focuses especially on positive individual traits (Seligman & Csikszentmihalyi, 2000). Many benefits of humor in the workplace have been proposed, for example the promotion of health, mental flexibility, and the facilitation of social interaction (Morreall, 1991; Romero & Pescosolido, 2008). Besides humor, creativity represents a key aspect of organizational success (Cho & Pucik, 2005). In order to remain competitive, organizations need creative and actively involved employees (Shalley & Gilson, 2004).

Numerous researchers investigated the relationship between humor and creativity in both a theoretical and an empirical manner. O'Quin and Derks (1997) suggested that humor and creativity rely on similar cognitive and emotional processes and mentioned originality and surprise as defining characteristics of both. Similar to this, Humke and Schaefer (1996) viewed the production of unexpected and unusual responses as well as the willingness to take risks as similarities between humor and creativity. Despite diverse operationalizations of both constructs, some studies found empirical support for the positive relationship between creativity and humor (e.g., Hauck & Thomas, 1972; Humke & Schaefer, 1996; Treadwell, 1970; Ziv, 1976). Only two studies examined the relationship between humor styles and creativity. Cayirdag and Acar (2010) chose 11 to 14 year old students as participants ($N = 84$) and measured creativity with a divergent thinking task, whereas Oral (2006) used 87 public employees as sample and self-reported characteristics of creative personality as indicator of creativity. Both studies were conducted in Turkey, but revealed inconsistent results and further impede the generalization of its findings due to different samples and operationalizations of creativity (Cayirdag & Acar, 2010; Oral, 2006). The sample of the present study consists of 165 university students from the German-speaking area. Creativity was assessed with three subtests of the Verbal Creativity Test from Schoppe (1975). The main goal of the study is to explore the association between the four humor styles proposed by Martin, Puhlik-Doris, Larsen, Gray, and Weir (2003) and creativity.

Some authors suggested that the relationship between humor and creativity may be mediated by affect (e.g., Hughes, 2009; Martin, 2010). According to Filipowicz (2006), humor can induce broad affective responses. Three different theories shed light on the possible effect of affective states on creativity. The broaden-and-build-theory of positive emotions assumes that positive emotions have

beneficial short and long-term effects on creativity (Fredrickson, 1998, 2001). The feelings-as-information-theory posits that affective states influence the adoption of information-processing strategies (Schwarz, 1990). Regarding creativity, this theory suggests positive affect to promote creativity and negative affect to be detrimental to creativity due to different processing styles (Schwarz, 1990). In contrast to this theory, the dual pathway to creativity model states that both positive and negative affective states can enhance creativity, but through different routes (De Dreu, Baas, & Nijstad, 2008; Nijstad, De Dreu, Rietzschel, & Baas, 2010). Based on empirical support for the dual pathway to creativity model (e.g., De Dreu et al., 2008; George & Zhou, 2002; To, Fisher, Ashkanasy, & Rowe, 2012; Vosburg & Kaufmann, 1997), this study follows its assumptions that negative as well as positive affect may have a beneficial effect on creativity.

The self-enhancing and affiliative humor styles were found to be positively associated with cheerfulness and psychological well-being (Martin et al., 2003), which indicates that these humor styles may also relate to positive affect. Contrary to these humor styles, the self-defeating and aggressive humor styles showed positive relationships with bad mood, hostility, and aggression (Martin et al., 2003). These findings lead to the assumption, that positive affect mediates the relationship between the positive humor styles (i.e., self-enhancing and affiliative humor style) and creativity and negative affect mediates the relationship between the negative humor styles (i.e., self-defeating and aggressive humor style) and creativity.

The present study is the first that investigates the relationship between humor styles and creativity with the mediating role of affect.

After a short overview of humor in the workplace, the conceptualization of humor styles is introduced. Definitions and operationalizations of creativity are discussed and furthermore the relationship between humor and creativity with regard to theoretical considerations and empirical evidence are detailed. Three theories are presented that shed light on the relationship between affect and creativity, accompanied with empirical findings. Finally, the mediating role of affect in the relationship between humor styles and creativity is proposed, resulting in the mediation models of the present study.

Theoretical Background

Humor in the Workplace

In the work context humor is suggested to provide valuable benefits to organizations in form of effective communication, enhanced motivation and lightened mood in organizational environments (Romero & Cruthirds, 2006). Holmes (2007) assumed that humor strengthens collegiality as well as relationships in the workplace, moderates instructions, releases tensions, and defuses anger. The results of a meta-analysis showed significant negative relationships between employees' positive humor and burnout, stress, and work withdrawal as well as positive relationships with work performance and workgroup cohesion (Mesmer-Magnus, Glew, & Viswesvaran, 2012). In accordance with these and other results, Mesmer-Magnus et al. (2012) concluded that positive humor relates to physical and mental health, fosters effective functioning at work, and weakens the negative effect of stress on mental health.

Humor is a multifaceted and complex phenomenon that is hard to define (Cooper, 2005; Leist & Müller, 2013). Mesmer-Magnus et al. (2012) suggested at least four factors that enhance the difficulty of defining and operationalizing humor: (1) literature rarely differentiates between the terms "sense of humor" and "humor"; (2) humor consists of multiple dimensions; (3) quantification of humor is manifold; and (4) there are various humor styles. Consistent with the first factor proposed by Mesmer-Magnus et al. (2012), Cooper (2005) recommended the distinction between humor expression (i.e., humor production) and sense of humor (i.e., humor appreciation) insofar as the former represents a behavior and the latter a trait. Cooper (2005) focused especially on humor expression due to its holistic manifestation within organizations. Hence she defined humor as "any event shared by an agent (e.g. an employee) with another individual (i.e. a target) that is intended to be amusing to the target and that the target perceives as an intentional act" (Cooper, 2005, p. 767). Romero and Cruthirds (2006) proposed a more general definition of organizational humor according to which humor consists of "amusing communications that produce positive emotions and cognitions in the individual, group, or organization" (p. 59).

There are a variety of functions that humor serves in the work context as well as in everyday life (Graham, Papa, & Brooks, 1992). In particular the use of humor by

individuals and in the interpersonal contact has been explored in literature (De Koning & Weiss, 2002). Graham et al. (1992) identified in their study both prosocial and antisocial functions of humor. This is in line with more recent literature suggesting that there exists not only beneficial uses but also potentially deleterious uses of humor (Martin et al., 2003). Martin et al. (2003) proposed a conceptual framework for different uses of humor with a focus on its relation to psychosocial well-being. This multidimensional approach also applies to uses of humor in the work context (Romero & Cruthirds, 2006; Scheel, Gerdenitsch, & Korunka, submitted). The following chapter provides a detailed insight into the theoretical model of humor styles.

Humor Styles

The framework developed by Martin et al. (2003) represents a 2 x 2 conceptualization of everyday functions of humor that result in four distinct dimensions relating to individual differences in humor use. Two of the four humor styles are thought to enhance one's relationship with others (i.e., affiliative and self-defeating humor style). As the focus is on the relationship with others, these humor styles are viewed to serve an interpersonal function of humor. The other two humor styles are said to enhance the self in form of self-protection and hence correspond to intrapsychic functions of humor (i.e., self-enhancing and aggressive humor style). The second distinction in this framework refers to whether the use of humor is potentially conducive or detrimental to well-being, which can also be referred to as adaptive vs. maladaptive functions (e.g., Kuiper & McHale, 2009; Liu, 2012). Martin et al. (2003) noted that the self-enhancing, affiliative, self-defeating, and aggressive humor styles are more a continuum rather than a dichotomy.

Self-enhancing humor style. The focus of the self-enhancing humor style lies on the intrapsychic function (Martin et al., 2003). This humor style describes the tendency to use humor as a coping strategy as well as to keep a humorous outlook on life even in stressful situations or adversity (Kazarian & Martin, 2004). Due to its self-protective function the self-enhancing humor helps to attain distance to a problem in tough situations and is said to be positively related to well-being (Martin et al., 2003). The self-enhancing humor style showed positive correlations with cheerfulness, self-esteem, and optimism as well as negative correlations with depression, anxiety, neuroticism, and bad mood (Martin et al., 2003). Additionally,

Kazarian and Martin (2006) reported a positive relationship between self-enhancing humor and perceived health, psychological well-being, and positive mood. Work-related self-enhancing humor was found to be positively associated with occupational self-efficacy and optimism (Scheel et al., submitted). Furthermore, self-enhancing humor correlated positively with coworker satisfaction, team cooperation, and organizational commitment (Romero & Arendt, 2011).

Affiliative humor style. This humor style yields an interpersonal function in a way that it facilitates relationships with others and reduces interpersonal tensions by telling jokes and engaging in spontaneous banter (Chen & Martin, 2007). Similar to the self-enhancing humor style, this use of humor is suggested to be beneficial to psychological well-being (Martin et al., 2003). Martin et al. (2003) found positive correlations between affiliative humor and extraversion, openness to experience, cheerfulness, self-esteem, and psychological well-being, as well as negative correlations with depression, anxiety, seriousness, and bad mood. Investigating humor styles in the work context, Scheel et al. (submitted) reported positive relationships between affiliative humor and optimism and occupational self-efficacy. Leist and Müller (2013) found the affiliative humor style to be positively related to self-regulatory strategies and life-satisfaction. Additionally, Romero and Arendt (2011) revealed negative associations between affiliative humor and stress, as well as positive associations with coworker satisfaction, team cooperation, and organizational commitment. Therefore this humor style is viewed as positive humor with beneficial effects for the individual (Mesmer-Magnus et al., 2012).

Self-defeating humor style. Self-defeating humor represents the use of humor for an interpersonal function with potentially unfavorable outcomes for individual well-being (Martin et al., 2003). This humor style is used to enhance relationships with others at the detriment of the self by making fun of oneself or laughing along with others when being disparaged or ridiculed (Chen & Martin, 2007). The self-defeating humor style was found to be positively associated with hostility, aggression, and bad mood (Martin et al., 2003). Furthermore, Martin et al. (2003) reported negative correlations between self-defeating humor and self-esteem, psychological well-being, and intimacy. Regarding the work context, Scheel et al. (submitted) revealed a negative relationship between self-defeating humor and job satisfaction.

Aggressive humor style. Similar to the self-enhancing humor, the aggressive humor style enhances the self thus it serves an intrapsychic function (Martin et al., 2003). However, the self-enhancement happens at the expense of others, therefore the aggressive humor style is said to be a hostile form of humor that is potentially detrimental to well-being (Kazarian & Martin, 2004). Aggressive humor includes the use of sexist or racist humor, sarcasm, mockery, and teasing for the purpose of manipulating or criticizing others (Chen & Martin, 2007). This humor style was found to be positively related to hostility, aggression, and neuroticism as well as negatively related to seriousness (Martin et al., 2003). Vaughan, Zeigler-Hill, and Arnau (2014) observed a negative association between aggressive humor and self-esteem level. Additionally, Romero and Arendt (2011) reported positive correlations between aggressive humor and stress as well as negative correlations with coworker satisfaction, team cooperation, and organizational commitment.

Summarizing these empirical findings, the differentiation between positive use of humor (i.e., self-enhancing and affiliative humor style) with potentially beneficial effects for the individual and negative use of humor (i.e., self-defeating and aggressive humor style) associated with detriments of well-being is quite apparent.

The next few sections provide an insight into the complex concept of creativity.

Creativity in the Workplace

Creativity is culturally valued in sciences, arts, political endeavors, and technology (Batey, 2012), and is further seen as a general sign of mental health and emotional well-being (Simonton, 2000). The capability of organizations to promote creativity and innovation are key aspects for competitive advantage (Cho & Pucik, 2005; Ko & Butler, 2007), organizational success, and survival (Amabile, 1996; George & Zhou, 2002). Therefore managers have continued to realize that they need creative as well as actively involved employees in order to remain competitive (Shalley & Gilson, 2004). According to Shalley and Gilson (2004), one may argue that not all professional positions require the same level of creativity, yet managers would agree that in almost every job there is room for employees to be more creative. Regarding the fact that employees' creativity is an inherent part of organizational success, it is not surprising that this resource is seen as a good attribute to possess (Simonton, 2000) and often characterized as an almost magical quality (Hirt, Devers, & McCrea, 2008).

Definitions of Creativity

Though the field of creativity studies has roots back to the 1930s (Runco & Jaeger, 2012), research boomed foremost in the 1960s and 1970s, and psychologists have recently shown renewed interest in the phenomenon (Simonton, 2000).

Guilford (1950), a pioneer in the field of creativity, proposed a tautological approach by defining creativity as the ability that is most characteristic of creative people. These creative abilities further determine whether one has the power to show creative behavior to a noteworthy degree (Guilford, 1950). Moreover, he proclaimed that motivational and temperamental traits are decisive whether the requisite creative abilities result in products of creative nature or not (Guilford, 1950).

Similar to this, Amabile (1996) viewed creativity as a quality of persons (i.e., the ability), processes (i.e., the behavior) and products, still she defined creativity as “the production of novel and useful ideas in any domain” (p. 1). She argued that science as well as management are based on observable phenomena thus focusing on creativity as an outcome seems advisable (Amabile, 1996). Furthermore, according to Amabile (1996), it is only by reference to the products that one can label individuals as being creative. Nevertheless, recent literature still suggests the distinction between creative results and creative processes (Davis, 2009; Fernández-Abascal & Díaz, 2013). The definition of creativity mostly relies on the dual standard of novelty and usefulness (Davis, 2009; Plucker, Beghetto, & Dow, 2004; Runco & Jaeger, 2012). While there has not yet been a uniformly accepted theory of creativity (Humke & Schaefer, 1996), the so-called standard definition consisting of these two requirements is quite common (Runco & Jaeger, 2012; Ward, 2007).

Originality. The first criteria, originality, also labeled as novelty or uniqueness (Davis, 2009), is considered as the hallmark of creativity (Nijstad, De Dreu, Rietzschel, & Baas, 2010). One cannot be creative without being original, otherwise ideas or products would not be novel, but commonplace, trivial, or conventional (Runco & Jaeger, 2012). According to Runco and Jaeger (2012), originality is vital for creativity, but not sufficient. “Originality can be found in the word salad of a psychotic and can be produced by monkeys on word processors. A truly random process will often generate something that is merely original” (Runco & Jaeger, 2012, p. 92). Hence the second requirement, appropriateness, is essential for defining creativity (Runco & Jaeger, 2012).

Appropriateness. Appropriateness is also referred to as usefulness, value (Davis, 2009), fit, or effectiveness (Runco & Jaeger, 2012). This aspect seems important insofar as original ideas or products that do not meet the criteria of appropriateness would be considered as irrelevant and crazy (Nijstad et al., 2010). Likewise, Guilford (1950) assumed that creative work has to be realistic or accepted and should consequently be done under some degree of evaluative restraint, whereby too much restraint can also harm the emergence of new ideas.

Operationalization of Creativity

A host of different ways to study the phenomenon of creativity has been proposed (Batey, 2012), in consequence there are over 60 measurements with the problem of no single task being universally accepted (Humke & Schaefer, 1996). Creativity has mostly been assessed with insight tasks, divergent thinking and idea generation tasks (Baas, De Dreu, & Nijstad, 2008), as well as with categorization and remote associates tasks (Davis, 2009). Although these and other tasks share important features and each offers useful information, they differ in substantial manners (Baas et al., 2008). For several decades, tasks on divergent thinking have dominated the field of creativity assessment (Runco & Acar, 2012), therefore they are portrayed in more detail here.

Divergent thinking. In his prominent theory Structure of Intellect, Guilford (1956) distinguished among others between the production factors convergent and divergent thinking. Characteristic for convergent thinking is that there usually exists one correct conclusion or answer, and thinking is controlled and channeled in the direction of this answer (Guilford, 1956). Accordingly, in tests assessing convergent thinking the individual has to find the proper solution to each item (Guilford, 1956). Opposed to convergent thinking, divergent thinking represents the ability to produce responses in various directions (Guilford, 1956). One reason the concept of divergent thinking is seen as attractive is that it leads to testable hypotheses and facilitates reliable assessment of the potential for creativity (Runco & Acar, 2012). Although divergent thinking is not the same as creativity, it is often accompanied with originality and is therefore considered as an indicator of creativity, rather than a synonym (Runco & Acar, 2012).

The generation of new ideas or uses for a specific object (e.g., a brick) is typical for divergent thinking tasks (Kaufman, Kozbelt, Bromley, & Miller, 2008). The evaluation of divergent thinking tasks is based on the factors fluency, originality,

flexibility (Davis, 2009), and sometimes elaboration (Runco & Acar, 2012). Fluency measures creative production as the number of generated ideas, problem solutions, insights, or products (De Dreu et al., 2008). Originality refers to the uniqueness of ideas and can be assessed with statistically infrequent responses to items (Guilford, 1950). Flexibility is defined by the variety of ideas (Davis, 2009) and reflects the ability to switch sets, approaches, and goals (Baas et al., 2008; Guilford, 1950). It is measured by the quantity of different semantic categories generated by a person (Baas et al., 2008). Elaboration, the least common factor contributing to divergent thinking, is suggested when a person follows an associative pathway for some distance (Runco & Acar, 2012).

These four factors are considered as distinct but interrelated components of divergent thinking (Baas et al., 2008). Tasks on divergent thinking capture the criteria of novelty, however the second criteria of creativity appropriateness is often ignored (Davis, 2009). To conclude, tasks on divergent thinking are not synonymous with tests of creativity, nevertheless they represent valid estimations of the individual's creative potential (Runco & Acar, 2012).

Humor and Creativity

The relationship between humor and creativity has been subject to investigations by a number of researchers (Humke & Schaefer, 1996) and many of them noted a close linkage between these constructs (Martin, 2010).

Literature provides several similarities and overlapping characteristics between humor and creativity. O'Quin and Derks (1997) suggested that humor and creativity rely on similar cognitive and emotional processes and mentioned originality and surprise as defining characteristics of both. According to them, being funny represents a challenge that can be solved with novelty and ingenuity, which are considered as key aspects of creativity (O'Quin & Derks, 1997). They further proposed that "humor as well as creativity are characterized by divergence followed by convergence" (O'Quin & Derks, 1997, p. 229). Similar to this, for Humke and Schaefer (1996) there seems to be an association between humor and creativity insofar as both involve the production of unexpected and unusual responses accompanied by some risk-taking. The shared characteristic of novelty is in line with Belanger, Kirkpatrick, and Derks (1998), who further suggested that both also require the successful manipulation of ideas. Reviewing literature, Martin (2010) summarized

incongruity, surprise, and novelty as necessary elements of humor and creativity thus stating that both involve a switch of perspective.

Murdock and Ganim (1993) concluded their review by assuming that humor is considered to be a subset of creativity. Disagreeing with this, O'Quin and Derks (1997) viewed humor and creativity as two separate domains that most obviously overlap in the area of humor production (in contrast to humor appreciation).

The next section gives an overview of empirical findings regarding the relationship between humor and creativity.

Empirical Findings - Humor and Creativity

Treadwell (1970) found positive relationships between three measures of creativity and humor production, but not with self-reported humor use and appreciation of humor. Another two studies revealed highly positive correlations between sense of humor and creativity (Hauck & Thomas, 1972; Humke & Schaefer, 1996). Comparable to this, Smith and White (1965) showed a positive correlation between wit and creativity. Ziv (1976) conducted an experiment and reported that participants who had been listening to a humorous record performed significantly better in a creativity test than participants in the control groups. No significant association between humor and creativity was found by Schoel and Busse (1971). They distinguished humorous students from less humorous students by teacher judgments and did not find any significant differences in creative performance (Schoel & Busse, 1971).

Although empirical evidence exists regarding the linkage between humor and creativity, drawing conclusions is difficult due to variations in operationalization (Humke & Schaefer, 1996) and a lack of clarity of both constructs (O'Quin & Derks, 1997).

Humor styles and creativity. Few studies explicitly examined the relationship between humor styles and creativity. Lang and Lee (2010) investigated liberating, stress-relieving, and controlling humor in the work context. They reported significantly positive correlations between liberating, stress-relieving humor and organizational creativity as well as a negative association between controlling humor and organizational creativity (Lang & Lee, 2010). Adopting the framework of Martin et al. (2003), Cayirdag and Acar (2010) found that the aggressive humor style of 11 to 14 year old students was negatively related to fluency, originality, and an overall

creativity index. The self-defeating humor style showed a negative correlation with fluency, whereas the affiliative and self-enhancing humor style did not reveal significant results (Cayirdag & Acar, 2010). Another study focusing on Turkish bureaucracy discovered a relationship between self-defeating humor style and self-reported creativity (Oral, 2006), unfortunately the direction of correlation was not mentioned.

These studies examining the relationship between humor styles and creativity revealed inconsistent findings and further cannot be generalized due to fundamentally different samples and operationalizations of creativity. The main goal of this study is to investigate the four humor styles proposed by Martin et al. (2003) and their relation to creativity. Despite the inconsistent findings regarding humor styles and creativity, theoretical considerations (e.g., O'Quin & Derks, 1997) as well as empirical research (e.g., Humke & Schaefer, 1996) proposed a close linkage between humor and creativity. All four humor styles were found to be positively related to sense of humor (Martin et al., 2003), and sense of humor revealed positive associations with creativity in past research (e.g., Hauck & Thomas, 1972). Hence I conclude that all four humor styles are positively related to creativity. This assumption leads to the following four hypotheses:

H1a. The self-enhancing humor style is significantly positively associated with creativity.

H1b. The affiliative humor style is significantly positively associated with creativity.

H1c. The self-defeating humor style is significantly positively associated with creativity.

H1d. The aggressive humor style is significantly positively associated with creativity.

Affect and Creativity - Theoretical Considerations

The terms affect, mood, and emotion are most commonly used to describe emotional phenomena (Baas et al., 2008). According to Fredrickson (2001), affect is a more general concept than emotions and refers to consciously accessible feelings that are not object-related. Likewise, Davis (2009) viewed mood and emotion as subcategories of affect, though some researchers used the terms affect and mood interchangeably (e.g., Carpenter, Peters, Västfjäll, & Isen, 2013; Isen, Daubman, & Nowicki, 1987; Watson, Clark, & Tellegen, 1988). In contrast to emotions, moods are

described as “relatively diffuse, generalized affective states that typically lack a particular object relation that stimulates an action-orientation” (Davis, 2009, p. 27). In empirical literature mood as well as affect are mostly conceptualized by a positive and negative dimension (Davis, 2009; Fredrickson, 2001). Besides the hedonic tone, other differentiations of mood and affect focus on activation and regulatory focus (Baas et al., 2008).

The following three theories propose mechanisms behind the relationship between affective states and creativity.

Fredrickson's (1998, 2001) broaden-and-built theory of positive emotions describes the effect of positive emotions on mental states and personal resources. The theory is particularly based on the positive emotions joy, interest, contentment, love (Fredrickson, 1998), and pride (Fredrickson, 2001). These concrete emotions are emphasized because, according to Fredrickson (1998), they are recognizable in different cultures and appear to be maximally distinct from one another (except for love). Positive emotions are suggested to serve as markers of optimal well-being, promote flourishing, and also create durably positive consequences (Fredrickson, 1998). The *broaden* component refers to the momentarily enhanced thought-action repertoire initiated by positive emotions, which is considered as encouragement to pursue a wider range of thoughts and actions than usual (Fredrickson, 1998). Not only do positive emotions have short-term effects, the broaden-and-built theory of positive emotions further posits that positive emotions build personal resources ranging from physical, intellectual, to social resources (Fredrickson, 1998). This function of positive emotions relates to the *build* component and is said to be more durable than the emotional states (Fredrickson, 1998). According to Fredrickson (1998, 2001), experiencing certain positive emotions enables the individual to explore unfamiliar, creative approaches to thought and action as well as broadens attention and cognition. Therefore this theory can be considered as possible explanation for the linkage between positive emotions and creativity (e.g., Amabile, Barsade, Mueller, & Staw, 2005; Hughes, 2009).

Schwarz (1990) proposed a similar approach to the relationship of emotion and cognition, whereby his theory also takes negative affective states into account. The feelings-as-information-theory suggests that different emotions or moods influence the individual's information-processing strategy (Schwarz, 1990), which is

consequently also considered as cognitive tuning hypothesis (Schwarz & Clore, 2003). The basic idea is that mood reflects the state of one's environment, thus affective states serve as an informational basis for individuals (Schwarz & Clore, 2003). Following the idea of Schwarz (1990), negative mood indicates a problematic situation, whereas positive mood signals a state of well-being and a benign situation. Depending on the different situations, thought processes adopt to meet the processing requirements for the respective situation (Schwarz, 1990). Individuals experiencing positive mood are more likely to rely on a less-effortful, heuristic processing strategy with focus on pre-existing knowledge and little attention to details (Schwarz, 2000). Furthermore, positive mood is accompanied with the willingness to take risks in ways of exploring novel solutions and a playful approach to tasks, which is beneficial for creativity (Schwarz, 1990). In contrast, individuals in a negative mood are assumed to adopt a more systematic processing style and analytic as well as detail-oriented thinking (Schwarz, 1990). According to the theory, negative mood fosters the motivation to change the current situation, which leads to a careful assessment, effortful analysis, and detailed explorations (Schwarz, 1990). Regarding creativity, Schwarz (1990) assumed that individuals in a positive as opposed to negative mood are more likely to show creative abilities due to a wider focus of attention and a lower risk aversion.

Affected by the cognitive tuning hypothesis (Schwarz, 1990), De Dreu et al. (2008) proposed the dual pathway to creativity model, which consists of two main ideas. First, the model suggests that creativity can be equally achieved by two qualitatively different processes, termed flexibility and persistence pathways (Nijstad et al., 2010). The flexibility pathway is characterized by "enhanced cognitive flexibility, set-breaking, and cognitive restructuring, which manifests itself in the use of many, broad, and inclusive cognitive categories" (De Dreu et al., 2008, p. 740). In addition, creativity can also be a result of the persistence pathway, manifesting in enhanced perseverance, systematic and effortful exploration (Nijstad et al., 2010). The second idea stated by De Dreu et al. (2008) refers to the link between mood and creativity. Similar to the assumptions of the cognitive tuning hypothesis (Schwarz, 1990), this model posits that the hedonic tone determines which of the two processing strategies (i.e., pathways) an individual will adopt (De Dreu et al., 2008). However, cognitive activation is a necessary precondition in order to achieve creativity (De Dreu et al., 2008). Therefore the model assumes that activating moods that are positive in tone

increase creativity through the flexibility pathway, whereas activating moods characterized by a negative tone facilitate creativity via the persistence pathway (De Dreu et al., 2008). The role of activation in the relationship between mood and creativity has been largely ignored in prior literature (Baas et al., 2008; De Dreu et al., 2008; Nijstad et al., 2010), though the evidence that deactivating mood is not associated with creativity seems quite strong (Nijstad et al., 2010).

Empirical Evidence - Affect and Creativity

Due to the large number of studies investigating the relationship between affect and creativity, it is useful to differentiate between experiments dealing with induced affective states and studies focusing on naturally occurring affective states (Ashby, Isen, & Turken, 1999).

Induced affect and creativity. One of the most popular findings derives from a series of four experiments, conducted by Isen, Daubman, and Nowicki (1987). Results showed that positive affect, induced by either a comedy film or a small gift, significantly facilitated creative problem solving (Isen et al., 1987). Induced negative affect and affectless arousal had no significant effect on creative problem solving (Isen et al., 1987). Whereas Isen et al. (1987) used college students for their experiments, Estrada, Isen, and Young (1994) chose physicians as subjects, who were randomly assigned to one of the three conditions. Subjects in the positive affect condition (received a small package of candy) significantly scored better on measures of creativity than the control group (Estrada et al., 1994). Similar to this, another two experiments examined very brief variations in induced affect and found that positive compared to negative affect increased creativity (Topolinski & Deutsch, 2012).

Other experiments investigated cognitive flexibility as outcome of induced affect. Isen, Johnson, Mertz, and Robinson (1985) reported that subjects in the positive affect condition showed a greater performance in cognitive flexibility than subjects in the control condition. Supporting the findings of Isen et al. (1985), three experiments revealed that subjects experiencing positive mood, relative to others, demonstrated more cognitive flexibility, thus indicating to be more creative (Murray, Sujan, Hirt, & Sujan, 1990). Likewise, Hirt et al. (2008) found that participants in an induced positive mood exhibited greater cognitive flexibility. In one of their three studies they further manipulated subjects' beliefs regarding the modifiability of moods and showed that the effect of positive mood on cognitive flexibility was only confirmed

for subjects believing that mood could be altered in contrast to the mood freezing condition (Hirt et al., 2008). Similar to results of cognitive flexibility, Fredrickson and Branigan (2005) reported a significant increase of scope of attention and thought-action repertoires in persons with induced positive emotions compared to a neutral state. As expected by the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), Fredrickson and Branigan (2005) further showed that induced negative emotions, again compared to a neutral state, narrowed thought-action repertoires.

Induced affect, naturally occurring affect, and creativity. Several studies used induced as well as naturally occurring affect to examine their relation to creativity. Fernández-Abascal and Díaz (2013) conducted three experiments, which revealed that both natural and induced positive affect facilitated performance on divergent thinking. Negative affect did not influence the outcome, neither did naturally occurring nor induced. Supporting the dual pathway to creativity model, De Dreu et al. (2008) found across four studies that activating positive as well as negative mood led to higher levels of creativity, but not deactivating mood. Unlike these findings, Vosburg and Kaufmann (1997) observed an inhibiting effect of positive affect on creativity, for both natural and induced positive affect. They further reported that experimentally induced negative affect significantly increased creativity (Vosburg & Kaufmann, 1997). Exploring the role of induced versus long-lasting, natural affective states, Forgeard (2011) performed an experiment with 96 undergraduates. Results indicated that the effect of affect induction on creativity depended on naturally occurring affect (Forgeard, 2011). On the one hand subjects high in depression were not affected by mood induction, on the other hand subjects low in depression showed higher creative performance, independent of the different mood inductions (Forgeard, 2011).

Naturally occurring affect and creativity. Most of the studies that explored naturally occurring affective states measured creativity with questionnaires. Rego, Sousa, Marques, and Pina e Cunha (2014) for example used supervisor ratings for the assessment of employees' creativity and found a significantly positive correlation between employees' creativity and positive affect. Similar to this, Amabile et al. (2005) measured creativity with monthly peer ratings and a daily questionnaire. The results of this longitudinal study revealed a positive relationship between positive affect and creativity, and further indicated that positive affect can function as

antecedent of creativity for up to two days (Amabile et al., 2005). Another study that focused on the work context took negative and positive affect as well as activation into account and examined its association with creative process engagement, which is considered as antecedent to creative performance (To et al., 2012). Consistent with the dual pathway to creativity model, To et al. (2012) reported that activating affects, positive and negative, were positively correlated with creative process engagement. Deactivating affects in both hedonic tones were negatively related to creative process engagement. George and Zhou (2002) not only explored the relationship between mood and creativity, but also examined conditions, under which this relationship appeared. They found that the relation between mood and creativity was moderated by clarity of feelings as well as perceived recognition and rewards. More specifically, negative mood was positively associated with creativity, but only when clarity of feelings as well as perceived recognition and rewards were both high. George and Zhou (2002) observed a similar effect with positive mood, whereas the relationship between positive mood and creativity was negative. In contrast to studies focusing on self-report questionnaires or supervisor ratings, Vosburg (1998) used divergent thinking tasks as operationalization for creativity and investigated its relation with positive and negative mood as well as with activation. The findings showed positive mood to facilitate creativity and negative mood to inhibit it (Vosburg, 1998).

Baas et al. (2008) conducted a meta-analysis to consider creativity as a function of specific mood states. They found that positive mood was associated with more creativity than neutral mood, whereas this effect was more observed for experiments than for correlational studies (Baas et al., 2008). The comparison between negative and neutral mood as well as between positive and negative mood did not reach a significant overall effect, however negative mood tended to be associated with less creativity than neutral mood in correlational studies (Baas et al., 2008). Another meta-analysis demonstrated similar results by confirming the facilitative effect of positive mood compared to neutral or negative mood on creativity (Davis, 2009). Based on these and other findings, Davis (2009) concluded that in addition to the referent mood state the factors mood attribution, mood intensity, and the operationalization of creativity play an essential role in the relationship between mood and creativity.

To sum up, most of this research used induced affect in experimental settings, whereas fewer studies examined the link between affect and creativity with naturally occurring affect, for example in organizational settings (Amabile et al., 2005; To et al., 2012). Furthermore, there seems to be more consistent support for positive rather than negative affect to be related to creativity (Amabile et al., 2005). Ashby et al. (1999) stated that “it is now well recognized that positive affect leads to greater cognitive flexibility and facilitates creative problem solving across a broad range of settings” (p. 530). Though the findings regarding the relationship between negative affect and creativity are not as consistent as with positive affect, some studies revealed that negative affect also had a beneficial effect on creativity, especially when activation was high (e.g., De Dreu et al., 2008; George & Zhou, 2002; To et al., 2012; Vosburg & Kaufmann, 1997). These results support the assumptions of the dual pathway to creativity model, which proclaims that not only positive, but also negative affect can lead to creativity in case of high activation (De Dreu et al., 2008; Nijstad et al., 2010).

Humor, Affect, and Creativity

As already described earlier, empirical literature has provided evidence regarding a positive relationship between humor and creativity (e.g., Humke & Schaefer, 1996). This relationship is suggested to be mediated by affect insofar that humor may indirectly promote creativity through its influence on affect (Chan, Chen, & Lavalley, 2013; Hughes, 2009; Martin, 2010). Isen et al. (1987) for example showed that humorous video clips lead to positive affect, which consequently facilitated creativity. According to Filipowicz (2006), humor can induce broad affective responses as well as activation. This effect was also observed for the four humor styles proposed by Martin et al. (2003). Self-enhancing and affiliative humor are assumed to be beneficial to well-being, which is supported by a positive relationship between both humor styles and cheerfulness, psychological well-being, and negative relationships with depression and bad mood (Martin et al., 2003). Therefore the self-enhancing and affiliative humor style may also be associated with positive affect. Regarding creativity, this leads to the assumption that positive affect mediates the relationship between the two humor styles and creativity.

H2a. Positive affect mediates the relationship between the self-enhancing humor style and creativity.

H2b. Positive affect mediates the relationship between the affiliative humor style and creativity.

Figure 1 displays both mediation models.

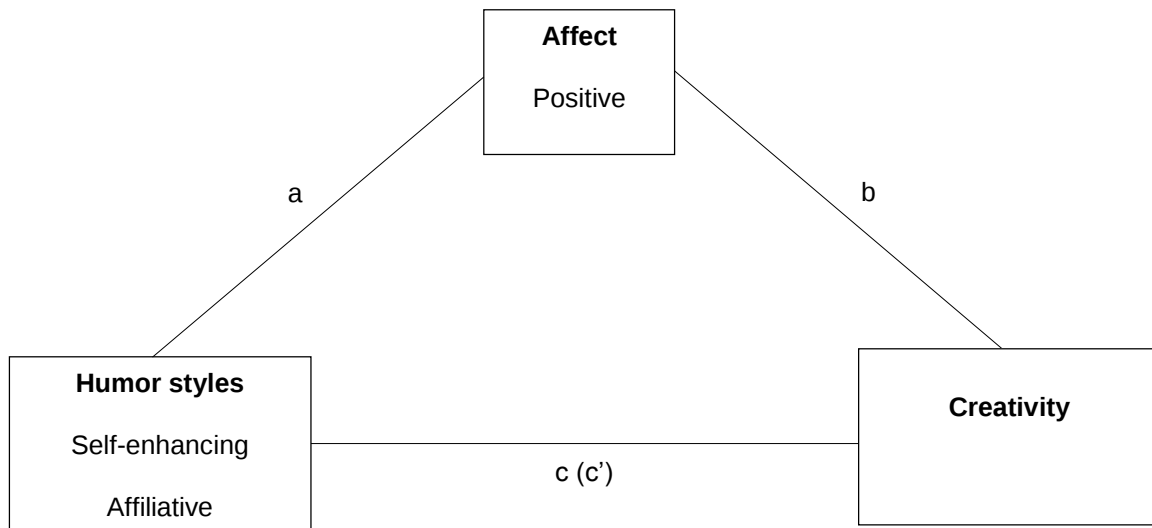


Figure 1. Positive affect mediates the relationship between the self-enhancing humor style and creativity, as well as the relationship between the affiliative humor style and creativity.

In contrast to the self-enhancing and affiliative humor style, the self-defeating and the aggressive humor styles are said to be detrimental to well-being (Martin et al., 2003). Self-defeating humor was found to be positively related to bad mood and negatively to psychological well-being (Martin et al., 2003). Furthermore, the self-defeating as well as the aggressive humor style were both positively associated with hostility and aggression (Martin et al., 2003). Based on these findings I assume that negative affect mediates the relationship between the potentially detrimental humor styles and creativity.

H2c. Negative affect mediates the relationship between the self-defeating humor style and creativity.

H2d. Negative affect mediates the relationship between the aggressive humor style and creativity.

Both mediation models are demonstrated in Figure 2.

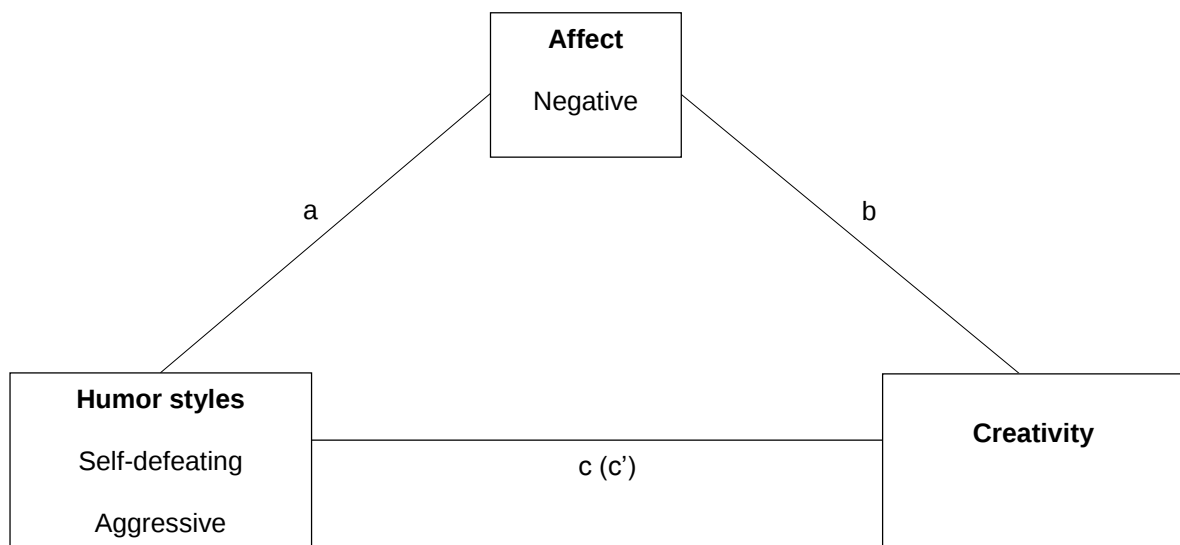


Figure 2. Negative affect mediates the relationship between the self-defeating humor style and creativity, as well as the relationship between the aggressive humor style and creativity.

Methods

Setting

The cross-sectional study was part of a larger study with a longitudinal as well as a cross-sectional design and an associated experiment. It was conducted in June and October 2014 in Vienna. Students were recruited in several courses of work and organizational psychology, with stubs hanging in buildings of the university, as well as via social media (e.g., Facebook). Each participant received five Euros for taking part in the experiment. All surveys were in the German language.

Procedure

A week before the experiment, participants filled out a questionnaire in either online or paper-pencil form. After this questionnaire they arranged themselves a date for the experiment with a distance of one week. The experiment took place in a room at the university and lasted about half an hour. At the beginning they completed another paper-pencil questionnaire containing the individual code for matching it with the first one. Afterwards, participants were instructed to watch one out of the four five

minute long videos on a laptop with headphones. The manipulations of the experiment (i.e., the videos) were randomized, as well as the order of the task presentation after the video. Thus the experiment was based on a 4 x 2 design. One video contained scenes from a documentary concerning Chernobyl (= negative video), one video showed nature settings accompanied with classical music (= positive video), another one had a short documentary on the physics of colors as content (= neutral video), and the last video contained multiple short clips with funny content (= humorous video). After watching the video, participants received the third and last questionnaire, which included tasks regarding creativity and logical reasoning. Every second questionnaire began with tasks on creativity, the other ones started with tasks on logical reasoning. This further condition included in the experiment was necessary in case the video manipulation only lasted for the first but not the second task.

For my study I used parts of all three questionnaires, which are discussed in more detail after the description of the participants.

Sample

About 350 participants filled out the first questionnaire. One hundred sixty eight participants took part in the experiment, whereby data of three participants were dropped. Data were excluded because the code of two participants could not be matched and one person unintentionally took part twice in the experiment. The final sample consisted of 165 students with ages between 18 and 52 years ($M = 24.4$, $SD = 4.7$). Of the 165 students 121 (73.3%) were female and 44 (26.7%) male. The majority (64.8%) studied psychology and 50.9% reported to work as well as study. Most participants ($N = 105$) were from Austria (63.6%), 49 (29.7%) from Germany and 11 (6.7%) participants mentioned other nations. In addition, 14 (8.4%) participants reported other mother languages than German; one person did not answer this question.

The subsequent section describes only the measures used in the current study.

Measures

Humor styles. The humor styles as independent variables were measured with the short work-related Humor Styles Questionnaire from Scheel et al.

(submitted), included in the questionnaire a week before the experiment (T1). This 12 item questionnaire is a German and work-related adaption of the original Humor Styles Questionnaire (Martin et al., 2003). Due to the student sample the questionnaire was adjusted to university context. Expressions as *my colleagues* were therefore replaced by *my fellow students*, the expression *at work* was removed. Each of the four humor styles was assessed with three items, which were rated on a 5-point Likert-scale ranging from 1 = *not at all* to 5 = *completely*. Sample items are “If I am feeling depressed, I can usually cheer myself up with humor.” (self-enhancing humor style), “I enjoy making my fellow students laugh.” (affiliative humor style), “Letting others laugh at me is my way of keeping my fellow students in good spirits.” (self-defeating humor style), and “If someone makes a mistake, I will often tease them about it.” (aggressive humor style). Reliability of the scales were $\alpha = .65$ for the self-enhancing humor style, $\alpha = .78$ for the affiliative humor style, $\alpha = .71$ for the self-defeating humor style, and $\alpha = .64$ for the aggressive humor style. Factor analysis confirmed a four-factor solution (see Table A20).

Affect. Positive and negative affect functioning as mediators were assessed with a variation of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). These primary dimensions of mood are understood as highly distinctive and not as opposing factors on one dimension (Watson et al., 1988). The entire study used the schedule three times, for this study only the version presented shortly before the experiment was relevant (T2). Participants were asked how they felt this day and rated the extent to which they experienced each mood state on a 5-point Likert-scale ranging from 1 = *not at all* to 5 = *completely*. The five items included in the scale for positive affect were active, cheerful, alert, determined, and inspired. The negative affect scale consisted of the five items ashamed, upset, hostile, sad, and nervous. Two items of the negative affect scale were excluded from further analyses due to high loadings (above .40) on a third factor (see Table A21). Reliabilities for the scales were $\alpha = .83$ for positive affect and $\alpha = .76$ for negative affect.

Creativity. For measuring creativity three subtests of the Verbal Creativity Test from Schoppe (1975) were used. In contrast to the solely quantitative task evaluation suggested by Schoppe (1975), a more holistic approach was applied in order to get different scales as fluency, appropriateness, flexibility, and originality. The following part describes each subtest and corresponding evaluation in detail.

Participants had two minutes and 30 seconds to solve the first task, which is called *Vierwort-Sätze* (four-word-sentences). In this subtest participants had to build as many sentences as possible with fixed initial letters (W-L-D-P), whereas the order of letters was modifiable. The evaluation of this task happened in form of a fluency score (i.e., each person received one point for a correct sentence). If the same two or more words were repeated in different sentences, the person only scored one point for two sentences due to redundancy.

The second subtest had a time limit of two minutes and its task was to find possible uses for a string. For the evaluation of this task each answer of each participant was assigned to a category with similar answers. This system of categories included all answers, sorted in respect with its content. To assess fluency, answers were simply counted and each participant received the corresponding score. In accordance to Schoppe (1975), appropriateness was calculated as the number of answers (i.e., fluency) minus inappropriate statements. An inappropriate answer was characterized for example by its inaccuracy (e.g., *to use* a string or *to make* a string). Whereas for fluency and appropriateness answers of the same categories were accepted, the score for flexibility consisted of the number of different categories. In order to calculate originality, the total number of answers in each category across persons was counted and participants received the corresponding scores. For example a statement, which was mentioned in the sample three times, scored three points for the participants. This procedure was performed with all answers of a participant and then these numbers were added up. Finally, this sum was divided by the number of answers to control for the quantity of statements. Afterwards, the score for originality was reversed in SPSS in order to have an easier interpretation. Thus higher scores in originality also mean higher originality.

In the third subtest participants were instructed to imagine possible consequences for a utopian situation and write them down. The situation was that the entire food of one day was administered in the form of a pill. Participants had four minutes to collect as many ideas as possible. The evaluation of answers was analogous to subtest two.

After evaluating the three tasks, the actual scales used in the analyses were calculated. For this step all values were z-transformed in order to adjust the different ranges caused by the three separate subtests. The total score for fluency represented the mean of all three task fluency scores. Likewise, the total scores for

flexibility, originality, and appropriateness were calculated, whereby here only the latter two tasks were taken into account.

The evaluation of creativity was done by two independent raters. Inter-rater reliability (i.e., the relative share of same decisions based on the total number of decisions) was calculated for each subtest. In the first subtest the two raters agreed in 93.4% of all decisions. The second subtest revealed a concordance of 88% and the relative share of agreement in the third subtest was 87.1%. The cases of disagreement were discussed in detail and subsequently assigned to the corresponding category.

Control variables. To exclude alternative explanations several control variables were included. Studies focusing gender differences in creativity showed inconsistent results, though Baer and Kaufman (2008) noted in their review that if there was a trend, women would perform better than men on creativity tasks. Therefore sex was included as a dichotomous variable (0 = *female*, 1 = *male*). Another control variable was age because some scholars found negative relationships with forms of creativity (Amabile et al., 2005). As part of the demographic data the questionnaire also captured the nations Germany (0 = *other nations*, 1 = *Germany*), Austria (0 = *other nations*, 1 = *Austria*), and other nations (0 = *Austria or Germany*, 1 = *other nations*); and mother language (0 = *other*, 1 = *German*). In case participants answered the option “other” they had the opportunity to report their nation or mother language. These control variables were important insofar as the questionnaire included tasks on verbal creativity in German. In addition, four dummy variables for the experimental manipulation were built, namely humorous video (0 = *other videos*, 1 = *humorous video*), negative video (0 = *other videos*, 1 = *negative video*), positive video (0 = *other videos*, 1 = *positive video*), neutral video (0 = *other videos*, 1 = *neutral video*), and one dummy variable for the order of task presentation (0 = *creativity first*, 1 = *logical reasoning first*).

Analyses

For testing the hypotheses 1a, 1b, 1c, and 1d hierarchical regression analyses were performed. In the first step the respective control variables were added all at once as predictors into the model. The second step included the independent variable to see if it predicts the dependent variable beyond the effect of the control variables. Control variables showing significant correlations (Table 1) with

corresponding dependent variables were used. Experimental manipulation and the order of task presentation were entered in each regression in order to rule out the different conditions implicated in the experiment. In case no significant relationships with dependent variables were detected in regression analyses control variables were dropped in subsequent analyses as recommended by Becker (2005). Residual analyses of the regression models revealed normal distribution (Kolmogoroff-Smirnov-Test; $p > .05$) as well homoscedasticity. Values corresponding to regression analysis are standardized beta coefficients.

Mediation analyses were conducted with the PROCESS macro for SPSS, which involves the bootstrapping procedure (Preacher & Hayes, 2008). According to Hayes (2009), "bootstrapping generates an empirical representation of the sampling distribution of the indirect effect by treating the obtained sample of size n as a representation of the population in miniature, one that is repeatedly resampled during analysis as a means of mimicking the original sampling process." (p. 412). As recommended by Hayes (2009) a number of 5000 resamples was chosen as well as a 95% confidence interval of the indirect effects. This procedure displays unstandardized beta coefficients and standard errors.

Results

Sex showed a significantly positive correlation with originality (Table 1), indicating higher scores for male participants. Therefore the effect of sex was controlled when originality was entered as dependent variable. Fluency, appropriateness, and flexibility were all significantly positively correlated with a dummy variable measuring the mother tongue German and negatively correlated with a dummy variable assessing nationality other than Germany or Austria (Table 1). This indicated higher scores in fluency, appropriateness, and flexibility when participants reported German as their mother tongue as well as Germany or Austria as their nationality. Despite these significant correlations both dummy variables did not reach significance in the regression analyses and were therefore excluded.

Table 1

Mean, Standard Deviation, Reliability Coefficient, and Intercorrelations among Variables

		M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
T1	1 Age	24.40 (4.77)																					
	2 Sex	25.9%	.13																				
	3 Nat. Germany	29.5%	-.13	.15																			
	4 Nat. Austria	63.3%	.14	-.11	-.86**																		
	5 Nat. other	6.6%	-.04	-.05	-.17**	-.35**																	
	6 Language German	90.4 %	-.06	-.01	.10	.31**	-.80**																
T2	7 Video humorous	24.7%	.09	.00	-.10	.11	-.04	.03															
	8 Video negative	25.3%	-.08	-.04	.02	.01	-.05	.08	-.34**														
	9 Video positive	24.1%	-.09	-.02	-.03	.02	.02	.07	-.33**	-.33**													
	10 Video neutral	25.3%	.08	.06	.11	-.14	.07	-.17*	-.34**	-.34**	-.33**												
	11 Group B vs. A	50%	-.15	-.14	-.10	.05	.07	.00	.01	-.00	.03	-.03											
T1	12 HS self-enhancing	3.15 (.80)	-.04	.09	.01	-.12	.20**	-.20**	-.09	-.09	.00	.17*	.22**	(.65)									
	13 HS affiliative	3.70 (.74)	-.02	.21**	.08	-.10	.06	-.05	.06	-.13	.02	.05	-.09	.22**	(.78)								
	14 HS self-defeating	2.30 (.90)	-.02	.06	-.00	-.03	.07	-.16*	-.10	-.11	.04	.18*	.03	.29**	.40**	(.71)							
	15 HS aggressive	2.04 (.73)	.09	.29**	.06	-.08	.05	-.12	.02	-.05	-.08	.12	.07	.13	.25**	.39**	(.64)						
T2	16 Positive affect	3.25 (.75)	.00	-.02	-.11	.04	.13	-.12	.03	-.18*	.10	.05	.17*	.28**	.09	.11	-.01	(.83)					
	17 Negative affect	1.35 (.63)	.14	-.10	.03	-.05	.04	-.03	-.03	.05	-.02	.01	-.08	.02	.05	.11	.18*	-.21**	(.76)				
	18 Fluency	0.00 (.75)	-.02	-.01	.08	.02	-.20*	.16*	.10	-.07	.10	-.13	-.05	-.10	.07	.08	.08	-.01	.19*				
	19 Appropriateness	0.00 (.84)	-.01	-.10	.08	.03	-.19*	.21*	.13	-.06	.04	-.11	-.05	-.18*	.03	.00	.02	-.03	.19*	.88**			
	20 Flexibility	0.00 (.83)	-.02	-.10	.09	.01	-.18*	.12*	.13	-.03	.02	-.11	-.05	-.15	.02	.02	.05	-.09	.20*	.85**	.96**		
	21 Originality	0.01 (.78)	.09	.20**	-.01	.08	-.12	.08	.07	-.15	.05	.04	-.02	-.02	.16*	.02	.08	-.12	.06	.33**	.34**	.39**	

Note. $N = 165$. Pearson Correlation, two-sided. Reliabilities (Cronbach's α) appear on the main diagonal in parentheses. Sex: 0 = female, 1 = male; group B vs. A = task on logical reasoning first vs. task on creativity first; HS = Humor Style. * $p \leq .05$, ** $p \leq .01$.

Self-enhancing Humor Style and Creativity - Hypothesis 1a

This hypothesis proposed a positive relationship between the self-enhancing humor style and creativity. Due to a total of one independent variable and four dependent variables included in this single hypothesis four regression analyses were carried out. As demonstrated in Table 2, the self-enhancing humor style did not show any significant relation to fluency, appropriateness, flexibility, and originality, though the regression analysis with self-enhancing as independent and appropriateness as dependent variable was almost significant ($p = .05$). The hypothesis 1a predicting a positive relationship between self-enhancing humor style and creativity is not supported.

Affiliative Humor Style and Creativity - Hypothesis 1b

As shown in Table 2 none of the four regression analyses with affiliative humor style as independent variable revealed significant relations to creativity. Therefore the hypothesis 1b proposing a positive relationship between affiliative humor style and creativity is not supported.

Table 2

Regression Analyses of Self-enhancing and Affiliative Humor Style on Creativity (Hypotheses 1a and 1b)

	Fluency			Appropriateness			Flexibility			Originality		
	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b
Humorous video	.18	.16	.18	.18	.15	.18	.18	.16	.18	.03	.02	.03
Positive video	.18	.17	.18	.12	.10	.12	.10	.08	.10	.02	.02	.02
Negative video	.04	.03	.05	.04	.01	.04	.06	.03	.06	-.13	-.14	-.13
Group B vs. A	-.06	-.04	-.05	-.05	-.02	-.05	-.05	-.03	-.05	.01	.02	.01
Sex										.20*	.21**	.21**
a self-enhancing HS		-.07			-.16			-.13			-.05	
b affiliative HS			.07			-.01			-.01			-.04
Model <i>F</i>	1.51	1.36	1.36	1.13	1.70	.90	1.10	1.33	.85	2.10	1.81	1.78
<i>R</i> ²	.036	.041	.041	.027	.051	.028	.026	.040	.026	.062	.065	.064

Note. *N* = 165. Results are standardized regression coefficients. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*), and sex (0 = *female*, 1 = *male*). HS = Humor Style. **p* ≤ .05, ***p* ≤ .01.

Self-defeating Humor Style and Creativity - Hypothesis 1c

This hypothesis predicted a positive relationship between the self-defeating humor style and creativity. Four regression analyses were performed because of one independent variable (i.e., self-defeating humor style) and four dependent variables (Table 3). The results showed no significant regression coefficients, thus the hypothesis is not supported.

Aggressive Humor Style and Creativity - Hypothesis 1d

Four regression analyses were conducted in order to test the hypothesis assuming a positive relationship between the aggressive humor style and creativity. As displayed in Table 3 no significant relationship was observed, therefore the data do not support this hypothesis.

Table 3

Regression Analyses of Self-defeating and Aggressive Humor Style on Creativity (Hypotheses 1c and 1d)

	Fluency			Appropriateness			Flexibility			Originality		
	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b
Humorous video	.18	.20*	.19	.18	.19	.18	.18	.20*	.18	.03	.04	.04
Positive video	.18	.19*	.19*	.12	.12	.12	.10	.11	.10	.02	.03	.04
Negative video	.04	.07	.06	.04	.05	.05	.06	.08	.06	-.13	-.11	-.11
Group B vs. A	-.06	-.06	-.06	-.05	-.05	-.05	-.05	-.06	-.06	.01	.01	-.00
Sex										.20*	.20*	.17*
a self-defeating HS		.11			.05			.08			.06	
b aggressive HS			.09			.05			.03			.10
Model <i>F</i>	1.51	1.57	1.47	1.13	.96	.99	1.10	1.05	.87	2.10	1.84	2.02
<i>R</i> ²	.036	.047	.044	.027	.029	.029	.026	.032	.027	.062	.066	.072

Note. *N* = 165. Results are standardized regression coefficients. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*), and sex (0 = *female*, 1 = *male*). HS = Humor Style. **p* ≤ .05, ***p* ≤ .01.

Hypotheses 2a, 2b, 2c, and 2d predicted a mediating effect of affect on the relationship between humor styles and creativity.

Mediation Effect of Positive Affect - Hypotheses 2a and 2b

To test the hypotheses assuming a mediation of positive affect on the relationship between humor styles (i.e., self-enhancing and affiliative) and creativity eight different mediation models were conducted. Similar to regression analyses, the experimental manipulation and the order of task presentation were included as control variables. Two models contained sex as additional control variable when originality was the dependent variable. The results of the mediation analyses for the self-enhancing humor style are displayed in Tables 4 - 7, and Tables 8 - 11 demonstrate the results corresponding to the affiliative humor style. Neither any significant total, direct, nor indirect effect could be observed. Four models with self-enhancing humor style as independent variable revealed a significant a-path, indicating a significantly positive relationship between the self-enhancing humor style and positive affect. The model containing the self-enhancing humor style as independent and appropriateness as dependent variable showed an almost significant total as well as direct effect ($p = .05$).

The data did not confirm the mediating role of positive affect in the relationship between positive humor styles and creativity. Therefore the hypotheses 2a and 2b are not supported.

Table 4

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Self-enhancing Humor Style and Fluency (Hypothesis 2a)

Steps	B (SE)	t	p	
Fluency regressed on self-enhancing humor style (c path)	-.07 (.08)	-.88	.381	
Positive affect regressed on self-enhancing humor style (a path)	.23 (.07)	3.16	.002	
Fluency regressed on positive affect, controlling for self-enhancing humor style (b path)	.01 (.08)	.08	.939	
Fluency regressed on self-enhancing humor style, controlling for positive affect (c' path)	-.07 (.08)	-.87	.386	
Partial effects of control variables on fluency				
Humorous video	.28 (.17)	1.69	.093	
Positive video	.29 (.17)	1.73	.085	
Negative video	.05 (.17)	.32	.753	
Group B vs. A	-.06 (.12)	-.53	.598	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.00	.02	-.037	.048

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 5

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Self-enhancing Humor Style and Appropriateness (Hypothesis 2a)

<i>Steps</i>	<i>B (SE)</i>	<i>t</i>	<i>p</i>	
Appropriateness regressed on self-enhancing humor style (<i>c</i> path)	-.17 (.10)	-1.97	.051	
Positive affect regressed on self-enhancing humor style (<i>a</i> path)	.23 (.07)	3.16	.002	
Appropriateness regressed on positive affect, controlling for self-enhancing humor style (<i>b</i> path)	.02 (.09)	.21	.835	
Appropriateness regressed on self-enhancing humor style, controlling for positive affect (<i>c'</i> path)	-.17 (.09)	-1.96	.052	
Partial effects of control variables on appropriateness				
Humorous video	.28 (.19)	1.52	.131	
Positive video	.19 (.19)	1.00	.317	
Negative video	.03 (.19)	.15	.883	
Group B vs. A	-.03 (.14)	-.21	.831	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.01	.02	-.039	.053

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 6

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Self-enhancing Humor Style and Flexibility (Hypothesis 2a)

<i>Steps</i>	<i>B (SE)</i>	<i>t</i>	<i>p</i>	
Flexibility regressed on self-enhancing humor style (<i>c</i> path)	-.13 (.08)	-1.54	.126	
Positive affect regressed on self-enhancing humor style (<i>a</i> path)	.23 (.07)	3.16	.002	
Flexibility regressed on positive affect, controlling for self-enhancing humor style (<i>b</i> path)	-.07 (.09)	-.77	.440	
Flexibility regressed on self-enhancing humor style, controlling for positive affect (<i>c'</i> path)	-.11 (.09)	-1.30	.195	
Partial effects of control variables on flexibility				
Humorous video	.30 (.18)	1.64	.104	
Positive video	.17 (.18)	.91	.366	
Negative video	.05 (.18)	.27	.789	
Group B vs. A	-.03 (.13)	-.24	.812	
	Unstandardized value	<i>SE</i>	<i>LL</i> 95% CI	<i>UL</i> 95% CI
Bootstrap results for indirect effect				
Effect	-.02	.02	-.075	.021

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 7

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Self-enhancing Humor Style and Originality (Hypothesis 2a)

Steps	B (SE)	t	p	
Originality regressed on self-enhancing humor style (c path)	-.05 (.08)	-.65	.514	
Positive affect regressed on self-enhancing humor style (a path)	.23 (.07)	3.04	.003	
Originality regressed on positive affect, controlling for self-enhancing humor style (b path)	-.15 (.09)	-1.74	.083	
Originality regressed on self-enhancing humor style, controlling for positive affect (c' path)	-.02 (.08)	-.23	.820	
Partial effects of control variables on originality				
Humorous video	.04 (.17)	.24	.813	
Positive video	.04 (.17)	.23	.820	
Negative video	-.27 (.17)	-1.62	.110	
Group B vs. A	.06 (.13)	.48	.631	
Sex	.36 (.14)	2.57	.011	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	-.03	.02	-.100	.002

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*), and sex (0 = *female*, 1 = *male*).

Table 8

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Affiliative Humor Style and Fluency (Hypothesis 2b)

<i>Steps</i>	<i>B (SE)</i>	<i>t</i>	<i>p</i>	
Fluency regressed on affiliative humor style (<i>c</i> path)	.07 (.08)	.88	.382	
Positive affect regressed on affiliative humor style (<i>a</i> path)	.10 (.08)	1.31	.192	
Fluency regressed on positive affect, controlling for affiliative humor style (<i>b</i> path)	-.02 (.08)	-.23	.818	
Fluency regressed on affiliative humor style, controlling for positive affect (<i>c'</i> path)	-.07 (.08)	.89	.373	
Partial effects of control variables on fluency				
Humorous video	.31 (.17)	1.86	.064	
Positive video	.31 (.17)	1.86	.064	
Negative video	.09 (.17)	.52	.606	
Group B vs. A	-.07 (.12)	-.61	.545	
	Unstandardized value	<i>SE</i>	<i>LL</i> 95% CI	<i>UL</i> 95% CI
Bootstrap results for indirect effect				
Effect	-.00	.01	-.035	.014

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 9

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Affiliative Humor Style and Appropriateness (Hypothesis 2b)

Steps	<i>B</i> (<i>SE</i>)	<i>t</i>	<i>p</i>
Appropriateness regressed on affiliative humor style (<i>c</i> path)	-.01 (.09)	-.14	.893
Positive affect regressed on affiliative humor style (<i>a</i> path)	.19 (.08)	1.31	.192
Appropriateness regressed on positive affect, controlling for affiliative humor style (<i>b</i> path)	-.02 (.09)	-.26	.796
Appropriateness regressed on affiliative humor style, controlling for positive affect (<i>c'</i> path)	-.01 (.09)	-.11	.915
Partial effects of control variables on appropriateness			
Humorous video	.35 (.19)	1.87	.064
Positive video	.23 (.19)	1.23	.219
Negative video	.08 (.19)	.40	.688
Group B vs. A	-.08 (.13)	-.60	.552
	Unstandardized value	<i>SE</i>	<i>LL</i> 95% CI <i>UL</i> 95% CI
Bootstrap results for indirect effect			
Effect	-.00	.01	-.041 .015

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 10

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Affiliative Humor Style and Flexibility (Hypothesis 2b)

<i>Steps</i>	<i>B (SE)</i>	<i>t</i>	<i>p</i>	
Flexibility regressed on affiliative humor style (<i>c</i> path)	.01 (.09)	.14	.889	
Positive affect regressed on affiliative humor style (<i>a</i> path)	.10 (.08)	1.31	.192	
Flexibility regressed on positive affect, controlling for affiliative humor style (<i>b</i> path)	-.10 (.09)	-1.14	.256	
Flexibility regressed on affiliative humor style, controlling for positive affect (<i>c'</i> path)	.02 (.09)	.26	.798	
Partial effects of control variables on flexibility				
Humorous video	.34 (.18)	1.88	.062	
Positive video	.20 (.18)	1.07	.267	
Negative video	.09 (.18)	.47	.639	
Group B vs. A	-.06 (.13)	-.46	.646	
	Unstandardized value	<i>SE</i>	<i>LL</i> 95% CI	<i>UL</i> 95% CI
Bootstrap results for indirect effect				
Effect	-.01	.01	-.062	.005

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 11

Results of Mediation Analysis: Positive Affect Mediates the Relationship between Affiliative Humor Style and Originality (Hypothesis 2b)

Steps	<i>B</i> (<i>SE</i>)	<i>t</i>	<i>p</i>
Originality regressed on affiliative humor style (<i>c</i> path)	-.04 (.08)	-.53	.596
Positive affect regressed on affiliative humor style (<i>a</i> path)	.10 (.08)	1.23	.222
Originality regressed on positive affect, controlling for affiliative humor style (<i>b</i> path)	-.15 (.08)	-1.81	.073
Originality regressed on affiliative humor style, controlling for positive affect (<i>c'</i> path)	-.03 (.08)	-.36	.722
Partial effects of control variables on originality			
Humorous video	.05 (.17)	.29	.775
Positive video	.04 (.17)	.26	.796
Negative video	-.27 (.17)	-1.62	.108
Group B vs. A	.05 (.12)	.41	.679
Sex	.36 (.14)	2.58	.011
	Unstandardized value	<i>SE</i>	<i>LL</i> 95% CI <i>UL</i> 95% CI
Bootstrap results for indirect effect			
Effect	-.02	.02	-.063 .004

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*), and sex (0 = *female*, 1 = *male*).

Mediation Effect of Negative Affect - Hypotheses 2c and 2d

These hypotheses proposed a mediation effect of negative affect on the relationship between self-defeating, aggressive humor style, and creativity. A total of eight mediation models were performed in order to test both hypotheses, which are presented in Tables 12 - 19. These models included the same control variables used in the models described above.

Table 12

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Self-defeating Humor Style and Fluency (Hypothesis 2c)

Steps	<i>B (SE)</i>	<i>t</i>	<i>p</i>	
Fluency regressed on self-defeating humor style (c path)	.09 (.07)	1.34	.181	
Negative affect regressed on self-defeating humor style (a path)	.13 (.06)	2.40	.018	
Fluency regressed on negative affect, controlling for self-defeating humor style (b path)	.21 (.09)	2.27	.025	
Fluency regressed on self-defeating humor style, controlling for negative affect (c' path)	.06 (.07)	.91	.363	
Partial effects of control variables on fluency				
Humorous video	.34 (.17)	2.09	.038	
Positive video	.33 (.16)	2.00	.048	
Negative video	.09 (.16)	.57	.570	
Group B vs. A	-.07 (.12)	-.60	.547	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.03	.02	.002	.081

Note. *N* = 165. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 13

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Self-defeating Humor Style and Appropriateness (Hypothesis 2c)

Steps	B (SE)	t	p	
Appropriateness regressed on self-defeating humor style (c path)	.04 (.08)	.57	.567	
Negative affect regressed on self-defeating humor style (a path)	.13 (.06)	2.40	.018	
Appropriateness regressed on negative affect, controlling for self-defeating humor style (b path)	.26 (.11)	2.45	.015	
Appropriateness regressed on self-defeating humor style, controlling for negative affect (c' path)	.01 (.08)	.12	.909	
Partial effects of control variables on appropriateness				
Humorous video	.36 (.19)	1.95	.053	
Positive video	.24 (.19)	1.30	.197	
Negative video	.08 (.19)	.41	.682	
Group B vs. A	-.06 (.13)	-.46	.647	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.04	.02	.005	.099

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 14

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Self-defeating Humor Style and Flexibility (Hypothesis 2c)

<i>Steps</i>	<i>B (SE)</i>	<i>t</i>	<i>p</i>
Flexibility regressed on self-defeating humor style (<i>c</i> path)	.07 (.07)	.99	.325
Negative affect regressed on self-defeating humor style (<i>a</i> path)	.13 (.06)	2.40	.018
Flexibility regressed on negative affect, controlling for self-defeating humor style (<i>b</i> path)	.25 (.10)	2.44	.016
Flexibility regressed on self-defeating humor style, controlling for negative affect (<i>c'</i> path)	.04 (.07)	.53	.598
Partial effects of control variables on flexibility			
Humorous video	.37 (.18)	2.05	.042
Positive video	.21 (.18)	1.14	.258
Negative video	.12 (.18)	.65	.519
Group B vs. A	-.07 (.13)	-.53	.600

	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.03	.02	.003	.100

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 15

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Self-defeating Humor Style and Originality (Hypothesis 2c)

<i>Steps</i>	<i>B (SE)</i>	<i>t</i>	<i>p</i>	
Originality regressed on self-defeating humor style (c path)	.05 (.07)	.77	.444	
Negative affect regressed on self-defeating humor style (a path)	.14 (.06)	2.53	.013	
Originality regressed on negative affect, controlling for self-defeating humor style (b path)	.09 (.10)	.92	.357	
Originality regressed on self-defeating humor style, controlling for negative affect (c' path)	.04 (.07)	.57	.570	
Partial effects of control variables on originality				
Humorous video	.07 (.17)	.43	.667	
Positive video	.05 (.17)	.31	.758	
Negative video	-.21 (.17)	-1.22	.226	
Group B vs. A	.02 (.12)	.17	.863	
Sex	.37 (.14)	2.63	.010	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.01	.01	-.005	.047

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*), and sex (0 = *female*, 1 = *male*).

Table 16

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Aggressive Humor Style and Fluency (Hypothesis 2d)

Steps	<i>B</i> (<i>SE</i>)	<i>t</i>	<i>p</i>	
Fluency regressed on aggressive humor style (<i>c</i> path)	.09 (.08)	1.14	.255	
Negative affect regressed on aggressive humor style (<i>a</i> path)	.05 (.07)	.70	.483	
Fluency regressed on negative affect, controlling for aggressive humor style (<i>b</i> path)	.22 (.09)	2.43	.017	
Fluency regressed on aggressive humor style, controlling for negative affect (<i>c'</i> path)	.08 (.08)	1.02	.307	
Partial effects of control variables on fluency				
Humorous video	.33 (.16)	2.02	.045	
Positive video	.33 (.16)	2.04	.044	
Negative video	.08 (.16)	.51	.610	
Group B vs. A	-.07 (.12)	-.63	.530	
	Unstandardized value	<i>SE</i>	<i>LL</i> 95% <i>CI</i>	<i>UL</i> 95% <i>CI</i>
Bootstrap results for indirect effect				
Effect	.01	.02	-.019	.064

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 17

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Aggressive Humor Style and Appropriateness (Hypothesis 2d)

Steps	B (SE)	t	p	
Appropriateness regressed on aggressive humor style (c path)	.05 (.09)	.57	.568	
Negative affect regressed on aggressive humor style (a path)	.05 (.07)	.70	.483	
Appropriateness regressed on negative affect, controlling for aggressive humor style (b path)	.26 (.10)	2.49	.014	
Appropriateness regressed on aggressive humor style, controlling for negative affect (c' path)	.04 (.9)	.44	.659	
Partial effects of control variables on appropriateness				
Humorous video	.36 (.18)	2.00	.049	
Positive video	.25 (.19)	1.34	.184	
Negative video	.08 (.18)	.44	.660	
Group B vs. A	-.06 (.13)	-.49	.628	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.01	.02	-.024	.069

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 18

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Aggressive Humor Style and Flexibility (Hypothesis 2d)

Steps	B (SE)	t	p	
Flexibility regressed on aggressive humor style (c path)	.03 (.09)	.36	.722	
Negative affect regressed on aggressive humor style (a path)	.05 (.07)	.70	.483	
Flexibility regressed on negative affect, controlling for aggressive humor style (b path)	.26 (.10)	2.56	.011	
Flexibility regressed on aggressive humor style, controlling for negative affect (c' path)	.02 (.09)	.22	.826	
Partial effects of control variables on flexibility				
Humorous video	.36 (.18)	2.00	.047	
Positive video	.20 (.18)	1.11	.269	
Negative video	.10 (.18)	.58	.565	
Group B vs. A	-.07 (.13)	-.51	.610	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.01	.02	-.023	.071

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), and group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*).

Table 19

Results of Mediation Analysis: Negative Affect Mediates the Relationship between Aggressive Humor Style and Originality (Hypothesis 2d)

Steps	B (SE)	t	p	
Originality regressed on aggressive humor style (c path)	.11 (.09)	1.27	.205	
Negative affect regressed on aggressive humor style (a path)	.08 (.07)	1.13	.259	
Originality regressed on negative affect, controlling for aggressive humor style (b path)	.09 (.10)	.95	.344	
Originality regressed on aggressive humor style, controlling for negative affect (c' path)	.10 (.09)	1.18	.239	
Partial effects of control variables on originality				
Humorous video	.07 (.17)	.40	.687	
Positive video	.07 (.17)	.39	.701	
Negative video	-.21 (.17)	-1.12	.220	
Group B vs. A	.01 (.12)	.07	.946	
Sex	.32 (.15)	2.18	.031	
	Unstandardized value	SE	LL 95% CI	UL 95% CI
Bootstrap results for indirect effect				
Effect	.01	.01	-.005	.046

Note. $N = 165$. Results are unstandardized beta coefficients. CI = confidence interval; LL = lower limit, UL = upper limit. Control variables were the three dummy variables for the experimental manipulation humorous video (0 = *other videos*, 1 = *humorous video*), positive video (0 = *other videos*, 1 = *positive video*), negative video (0 = *other videos*, 1 = *negative video*), group B vs. A as the order of task presentation (0 = *VKT first*, 1 = *CRT first*), and sex (0 = *female*, 1 = *male*).

Three models with the self-defeating humor style as the independent and creativity as dependent variable showed significant indirect effects.

As displayed in Table 12, the total effect of the self-defeating humor on fluency was non-significant ($B = .09$, $t(162) = 1.34$, $p = .181$). It was found that self-defeating humor was positively related to negative affect ($B = .13$, $t(162) = 2.40$, $p = .018$). Like the a-path, results for the b-path indicated a significant association between negative affect and the outcome fluency ($B = .21$, $t(162) = 2.17$, $p = .025$). Mediation analysis confirmed an indirect effect of self-defeating humor on fluency through negative affect ($B = .03$, $CI = .002$ to $.081$). The direct effect of self-defeating humor on fluency was non-significant ($B = .06$, $t(162) = .91$, $p = .363$).

Table 13 demonstrates the results of the mediation model with the self-defeating humor style as independent, appropriateness as dependent, and negative affect as mediator variable. The total effect of self-defeating humor style on appropriateness was non-significant ($B = .04$, $t(162) = .57$, $p = .567$). As in the model before, the a-path revealed a significant result ($B = .13$, $t(162) = 2.40$, $p = .018$). The b-path indicated a significantly positive association between negative affect and appropriateness ($B = .26$, $t(162) = 2.45$, $p = .015$). In contrast to the direct effect ($B = .01$, $t(162) = .12$, $p = .909$), the confidence interval of the indirect effect did not contain zero ($B = .04$, $CI = .005$ to $.099$) and can therefore be considered as significant indirect effect.

Another model containing significant results included the self-defeating humor style as independent and flexibility as dependent variable (Table 14). The total effect was non-significant ($B = .07$, $t(162) = .99$, $p = .325$). The a-path showed a significant result ($B = .13$, $t(162) = 2.10$, $p = .018$), indicating a positive relationship between the self-defeating humor style and negative affect. Similar to this, the b-path revealed a significantly positive association between negative affect and flexibility ($B = .25$, $t(162) = 2.44$, $p = .016$). The direct effect of this model was non-significant ($B = .04$, $t(162) = .53$, $p = .598$), whereas the indirect effect of negative affect showed a significant result ($B = .03$, $CI = .003$ to $.100$).

As displayed in Table 15, the mediation model including the self-defeating humor style as the independent and originality as the dependent variable did not reveal any significant total, direct, or indirect effect.

To summarize these findings, three significant indirect effects were observed with the self-defeating humor style as the independent and fluency, appropriateness,

and flexibility as dependent variables via negative affect. According to Hayes (2009), significant total or direct effects are not required when observing indirect effects. Mathieu and Taylor (2006) stated that mediator variables are “explanatory mechanisms that shed light on the nature of the relationship that exists between two variables. If no such relationship exists, then there is nothing to be mediated” (p. 1038). Furthermore, they defined indirect effects as a “special form of intervening effect whereby X and Y are not related directly (i.e., are uncorrelated), but they are indirectly related through significant relationships with a linking mechanism” (Mathieu & Taylor, 2006, p. 1039). Therefore the indirect effect of self-defeating humor style on creativity through negative affect is not characterized as mediation.

Four mediation models with the aggressive humor style as the independent and creativity as the dependent variable did not show any significant total, indirect, or direct effect, though the b-paths were significant, indicating a positive relationship between negative affect and creativity (Tables 16 - 19).

The results of a total of eight mediation models do not support the hypothesis assuming a mediation effect of negative affect on the relationship between self-defeating, aggressive humor style, and creativity. However, the self-defeating humor style had an indirect effect on creativity via negative affect.

Discussion

This study investigated the relationship between humor styles and creativity and further explored the mediating role of affect in this relationship. The results showed that none of the four humor styles were directly associated with fluency, appropriateness, flexibility, or originality. Mediation analyses revealed no significant total, direct, and indirect effects with the self-enhancing as well as with the affiliative humor styles as the independent variables and positive affect as the mediator variable. The self-enhancing humor style was significantly positively related to positive affect, but positive affect did not correlate with any indicators of creativity. Therefore the mediating role of positive affect on the relationship between humor style and creativity was not supported. In contrast to this, the self-defeating humor style was found to have an indirect effect on three indicators of creativity (i.e., fluency, appropriateness, flexibility) via negative affect. The self-defeating humor style was significantly positively associated with negative affect, which in turn

positively correlated with creativity. The mediation models with aggressive humor style as independent variable did not show any significant results besides significantly positive relationships between negative affect and creativity.

Humor Styles and Creativity

O'Quin and Derks (1997) suggested that humor and creativity most obviously overlap in humor production as opposed to humor appreciation. Thus they assumed that humor production may be more strongly linked with creativity than humor appreciation (O'Quin & Derks, 1997). The humor styles are characterized by the functions that humor serves in daily life and focuses on the individual use of humor, but they do not include the aspect of actual humor production (Martin et al., 2003). Treadwell (1970) observed positive relationships between humor production and creativity, but not with self-reported use of humor and appreciation of humor. She further reported that the use of humor was not significantly correlated with humor production, indicating that both forms of humor share few similarities. In respect of creativity and humor, Martin (2010) mentioned incongruity, surprise, and originality as requirements for both. Especially originality, which is considered as a hallmark of creativity (Nijstad et al., 2010), is not part of the conceptualization of humor styles. Humor styles and creativity do not share many characteristics (compared to humor production and creativity), which may influence the strength of the relationship between these constructs.

Another study examining the relationship between humor styles and creativity revealed that the self-defeating and aggressive humor styles were significantly negatively correlated with creativity (Cayirdag & Acar, 2010). They further conducted regression analyses with creativity as the independent and humor styles as the dependent variables and found non-significant results. Oral (2006) observed a significant relationship between the self-defeating humor style and self-reported creativity, but not with the other humor styles. Greenberg (2008) reported in her bachelor thesis that humor styles did not act as indicator of self-reported creative achievement. The different samples and operationalizations used in these studies impede the generalization of its findings. Nonetheless, it seems that especially the self-enhancing and affiliative humor style are not associated with creativity. The findings of Cayirdag and Acar (2010) indicated a negative relationship between the self-defeating humor style and creativity, which is contradictory to the positive indirect association between the self-defeating humor style and creativity found in the present

study. Regardless of the direction of correlations, it seems that of all four humor styles the self-defeating humor style is the one that is most likely associated with creativity.

Humor Styles, Affect, and Creativity

Two of the four humor styles were found to be correlated with affect. As expected, the self-enhancing humor style was positively associated with positive affect and the self-defeating humor style was positively associated with negative affect. This supports the conceptualization of Martin et al. (2003), assuming the self-enhancing humor style to be potentially beneficial to well-being and the self-defeating humor style to be potentially detrimental. The results did not confirm the relationship between the affiliative and aggressive humor style and affect.

None of the four hypotheses proposing a mediating effect of affect on the relationship between humor styles and creativity were supported. However, the self-defeating humor style showed an indirect effect on creativity through negative affect. In general, this result is in line with the persistence pathway of the dual pathway to creativity model, which assumes that both positive and negative affect can facilitate creativity, but through different routes (Baas et al., 2008; Nijstad et al., 2010). In contrast to negative affect, the beneficial effect of positive affect on creativity via the flexibility pathway was not confirmed. Although the self-enhancing humor style was positively related to positive affect, positive affect was not associated with any of the four indicators of creativity. The dual pathway to creativity model further posits that activation is a necessary precondition in order to achieve creativity on the basis of affect (Nijstad et al., 2010). Because this study did not examine the role of activation in the relationship between affect and creativity, it seems quite possible that activating positive affect is associated with creativity. Several studies found that activating positive and negative affect led to creativity, thus supporting the dual pathway to creativity model (e.g., De Dreu et al., 2008; To et al., 2012).

Unlike the dual pathway to creativity model, Schwarz (1990) suggested in his feelings-as-information-theory that positive affect in contrast to negative affect would increase creativity due to different processing styles. According to the theory, positive affect informs the individual to be in a safe environment, which leads to a more heuristic processing style and promotes the willingness to take risks as well as the exploration of novel ideas (Schwarz, 1990, 2000). Negative affect is said to be accompanied with a systematic processing style, fosters detailed explorations and

effortful solution finding (Schwarz, 1990). Although the origins of the feelings-as-information-theory did not propose that negative affect relates to creativity (Schwarz, 1990), some authors used the same theoretical considerations to justify that negative affect still can have a facilitative effect on parts of creativity (e.g., George & Zhou, 2002; Vosburg & Kaufmann, 1997). Vosburg and Kaufmann (1997) for example stated that the processing style initiated by negative affect is characterized by deeper investments and elaborations in the task. They further assumed that individuals experiencing negative affect focus on optimizing strategies and are more concerned with the quality of solution, whereas positive affect promotes the satisficing strategy, resulting in a higher number of solutions (Vosburg & Kaufmann, 1997; Vosburg, 1998). A similar approach comes from George and Zhou (2002), who suggested that individuals experiencing negative affect try harder and are more persistent to come up with creative ideas. The role of persistence and processing styles could be a possible explanation for the positive relationship between negative affect and creativity found in the present study.

Another interesting explanation for the link between negative affect and creativity was proposed by Verhaeghen, Joorman, and Khan (2005). Based on empirical findings they observed that the relationship between depressed mood and creativity was mediated by self-reflective rumination. Self-reported depressive symptomatology was positively related to self-reflective rumination, which in turn was associated with higher performance in creativity and creative interests (Verhaeghen et al., 2005). They concluded that self-reflective rumination increases the motivation in form of seriousness about creative endeavors. This idea is comparable with the enhanced effort triggered by negative affect according to Schwarz (1990), as well as with the persistence pathway proposed by Nijstad et al. (2010). These approaches are suggested to provide understanding of the positive relationship between negative affect and creativity revealed by the present study.

Limitations and Strengths

A few limitations and strengths of the present study have to be mentioned. The generalization of the findings may be limited due to the nature of the sample. This study used students as participants of whom most were female (73.3%). In order to enhance the generalizability, future research should focus on samples close to the work context with a balance of female and male participants. Furthermore, the study was conducted as part of a larger project with an associated experiment, which used

different between-subjects conditions. Although these conditions were entered as control variables in several statistical analyses, there still remains the question in how far the results are confounded with the influence of the experiment. In view of the significant results found with negative affect, it seems important to note that the mean of the negative affect scale was quite low compared to the mean of the positive affect scale. This indicates that only a few participants reported experiencing negative affect on the day of the data collection. Another limitation refers to the assessment of creativity, with which many studies that examine creativity are confronted. Ward (2007) suggested that scores of divergent thinking tests are only the end result of the underlying cognitive processes engaged in creativity. A similar approach comes from Runco and Acar (2012), who stated that though divergent thinking tests are valid estimates of creativity, they should not be seen as synonyms to creativity tests. Moreover, the test used in this study may be verbally biased, because not only do creative abilities contribute to performance, but also linguistic skills (Runco & Acar, 2012).

Compared with past research that solely examined the relationship between humor and creativity (e.g., Humke & Schaefer, 1996; Treadwell, 1970), the present study also considered possible explanations for, and mechanism behind, this relationship. By measuring positive and negative affect as mediators, this study provides more holistic informational value and contributes to the understanding of the humor styles, affect, and creativity triangle. Almost all studies that investigated the relationship between naturally occurring affect and creativity assessed creativity with questionnaires (e.g., Amabile et al., 2005; Rego et al., 2014). In contrast to these, the present study measured objective performance on the Verbal Creativity Test. Another strength of this study is the capture of naturally occurring affect. Most of the studies that explored the linkage between affect and creativity are characterized by laboratory settings with the induction of affective states. The assessment of naturally occurring affect enhances the external validity of the findings of the present study. Moreover, Forgeard (2011) reported that the effect of affect induction on creativity depend on naturally occurring affect. Therefore naturally occurring affect as used in the present study seems more advisable for the exploration of the affect creativity link.

Theoretical and Practical Implications

To sum up, this study revealed no support for a direct relationship between humor styles and creativity. Regarding the role of affect in this relationship, only the self-defeating humor style had an indirect effect on creativity through negative affect. Negative affect was found to be positively correlated to creativity, which partially accounts for the dual pathway to creativity model (Nijstad et al., 2010). As opposed to this, positive affect was not associated with creativity. An explanation can be that negative in contrast to positive affect may be accompanied by increased motivation, persistence, deeper investments, and explorations (George & Zhou, 2002; Schwarz, 2000; Vosburg & Kaufmann, 1997). Future research should therefore consider the function of motivation and effort on the task, which may mediate the relationship between affect and creativity. Another possibility would be that motivation accounts for creativity even beyond the influence of affect. To further explore the link between affect and creativity it would also be necessary to not only assess the valence of affect, but also its activation, as recommended by the dual pathway to creativity model (Nijstad et al., 2010). Because the results of the present study did not show a direct relationship between humor styles and creativity, it would be interesting to examine a possible indirect effect with motivation as mediator variable. Another research gap exists concerning the role of humor styles of other people and creativity. To what extent does the humor style of supervisors or coworkers influence one's own motivation to be creative or even one's own creative performance at work? Future studies conducted in the work context could answer this question and would further allow to deduce practical implications.

In general, the self-enhancing and affiliative humor styles are most commonly recommended due to their favorable effect on well-being found in prior research (e.g., Martin et al., 2003; Romero & Cruthirds, 2006). As expected, a potentially harmful effect of the self-defeating humor style on well-being was observed in the present study, though this humor style also had an indirect effect on creativity via negative affect. The suggestion to use the self-defeating humor style in order to be creative would be too far-reaching. The self-defeating humor style was found to be accompanied by several negative outcomes and is therefore not recommended (e.g., Martin et al., 2003). The positive relationship between negative affect and creativity may be interpreted as a certain degree of seriousness of the task. Applied to the work context, this could mean that if someone is having a "bad day" this does not

mean that one cannot be creative. Furthermore, experiencing positive affect seems not to be essential to creativity or at least does not account for creativity in isolation. The results of a meta-analysis indicated that activating affective states are necessary for creativity, leading to the proposition that in order to promote creativity among employees, too relaxing situations can be counterproductive (Baas et al., 2008). According to Amabile (1996), task motivation and expertise contribute to creativity besides creativity skills. Especially task motivation seems an apparent criterion that managers can further use to create a work environment where creativity can flourish.

This study was the first that investigated the relationship between humor styles, affect, and creativity. No significant association was observed between the humor styles and creativity. Yet, the self-enhancing and the self-defeating humor styles were found to be correlated with affect in the proposed direction. The self-defeating humor style showed an indirect effect on creativity through negative affect. Negative affect and creativity were positively correlated, which supports the persistence pathway of the dual pathway to creativity model (Nijstad et al., 2010). Positive affect did not correlate with creativity, which could be explained by lack of motivation and effort (Schwarz, 1990, 2011). Future research should therefore explore task motivation as a possible mediator in the relationship between affect and creativity.

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Appendix

Table 20

Factor Analysis of the Short Work-related Humor Styles Questionnaire

	Factor			
	1	2	3	4
<i>Self-enhancing humor style</i>				
If I am feeling depressed, I can usually cheer myself up with humor.	.64	.38		
If I am feeling upset or unhappy I usually try to think of something funny about the situation to make myself feel better.	.75		.23	
If I'm feeling unhappy, I make an effort to think of something funny to cheer myself up.	.84			
<i>Affiliative humor style</i>				
I don't have to work very hard at making my fellow students laugh - I seem to be a naturally humorous person.		.82		
I enjoy making my fellow students laugh.		.79		
I usually can think of witty things to say when I'm with my fellow students.		.80		.24
<i>Self-defeating humor style</i>				
I will often get carried away in putting myself down if it makes my fellow students laugh.			.81	
I often try to make my fellow students like or accept me more by saying something funny about my own weaknesses, blunders, or faults.			.78	

Letting others laugh at me is my way of keeping my fellow students in good spirits.	.42	.61	.26
<i>Aggressive humor style</i>			
If someone makes a mistake, I will often tease them about it.		.39	.58
If I don't like someone, I often use humor or teasing to put them down.	.22		.81
If something is really funny to me, I will laugh or joke about it even if someone will be offended.			.78

Note. $N = 165$. Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization. Rotation converged in 5 iterations. Loadings higher than .20 are displayed. Factor loadings > .40 are in boldface.

Table 21

Factor Analysis of the Positive and Negative Affect Schedule

	Factor		
	1	2	3
<i>Positive affect</i>			
active	.76		.26
cheerful	.76	-.22	
alert	.74		
determined	.82		
inspired	.76		
<i>Negative affect</i>			
upset		.83	
hostile		.84	
ashamed*		.30	.48
nervous*			.89
sad	-.22	.69	.36

Note. $N = 165$. Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization. Rotation converged in 5 iterations. Loadings higher than .20 are displayed. Factor loadings $> .40$ are in boldface. *Items were excluded from the analysis due to high factor loadings ($> .40$) on a third factor.

Zusammenfassung

Humor und Kreativität werden in der Arbeitswelt hoch geschätzt aufgrund ihrer positiven Auswirkungen sowohl auf Mitarbeiterinnen und Mitarbeiter als auch auf Organisationen. Diese Studie ist die erste, die die Beziehung zwischen vier Humorstilen und Kreativität unter Berücksichtigung von Affekt als Mediatorvariable untersucht. 165 Studierende füllten eine kurze, arbeitsbezogene Version des Humor Styles Questionnaire und die Positive and Negative Affect Schedule aus, zudem bearbeiteten sie drei Aufgaben aus dem Verbalen Kreativitätstest. Die Ergebnisse zeigten keinen direkten Zusammenhang zwischen den Humorstilen und Kreativität, wobei der selbstabwertende Humorstil einen indirekten Effekt auf drei Facetten von Kreativität über negativen Affekt aufwies. Der gefundene Effekt ist konkordant mit dem Persistenz Pfad des dual pathway to creativity model, welches annimmt, dass nicht nur positiver sondern auch negativer Affekt die Kreativität steigern kann wegen erhöhter Persistenz. Der selbstaufwertende Humorstil korrelierte positiv mit positivem Affekt, jedoch stand positiver Affekt im Vergleich zu negativem Affekt in keinem signifikanten Zusammenhang mit Kreativität. Zukünftige Forschung sollte besonders die Rolle von Motivation in der Beziehung zwischen Affekt und Kreativität fokussieren.

Lebenslauf

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Sonstige Kenntnisse

Fremdsprachen:

- Englisch: fließend
- Französisch: gute Kenntnisse
- Italienisch: Grundkenntnisse

Führerschein B

EDV:

- Microsoft Office (Word, Excel, Access, Powerpoint, Outlook)
- SPSS
- Literaturrecherche - aufbereitung (u.a. PSYINDEX, PsycINFO, Zotero)
- Unipark, LimeSurvey

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Leistungsstipendium der Universität Wien: 07.10.2013 - 25.10.2013