**Title:** Is humor temperament associated with being creative, original, and funny? A tale of three studies


## Abstract

While humor production and creativity may be interrelated, no study has examined whether the temperamental basis of humor promotes creativity. The present study investigated whether humor temperament is associated with creativity. Study one ($N$=620) investigated the associations between humor temperament (i.e., cheerfulness, seriousness, bad mood), self-report creativity, and judges' ratings of verbal creativity (i.e., wit, originality, humor). Self-report findings revealed cheerfulness ($r$=.49; $BF_{10}$>100) and seriousness ($r$=.24; $BF_{10}$>100) were positively associated with self/everyday creativity, while bad mood ($r$=-.36; $BF_{10}$>100) was negatively associated. Cheerfulness, seriousness, and bad mood were not associated with judges' ratings of originality, wit, and humor in verbal creativity. Study two ($N$=439) evaluated the associations between humor temperament and judges' ratings of how well individuals coped with daily stressors. Cheerfulness was associated with judges' ratings of effective stress management ($r$=.23; $BF_{10}$>100) and conflict management ($r$=.19; $BF_{10}$ >100), while bad mood was negatively associated with effective stress management ($r$=-.29; $BF_{10}$ >100). Study three ($N$=234) examined the associations between humor temperament, comic styles (e.g., fun, nonsense, satire), and judges' ratings of creativity (i.e., originality, wit, humor) in a humor production task. While humor temperament traits were not associated with creativity, comic styles "humor" and "nonsense" were associated with creativity. Results inform the impact of cheerfulness on increasing cognitive flexibility in generating innovation in everyday creativity.


*Keywords*: Humor, creativity, stress, cheerfulness, funny, seriousness, bad mood

# Is Humor Temperament Associated With Being Creative, Original, and Funny? A Tale of Three Studies

Creativity is broadly defined as an individual's ability to innovate new ideas, draw novel links between these ideas, and explore newfound solutions to problems that are useful or influential (Paulus & Nijstad, 2003; Runco, 2004). Over the years, findings emerged in the creativity literature that point to multidimensional theories for the assessment of creative behaviours through self-report, other-report, and various performance tasks (Ruch & Heintz, 2019). While creativity may be defined as the eminence of infamous discoveries and major achievements of civilization, these behaviours tend to exhibit low base rates and remain difficult to quantify in the general population (Tohver & Lau, 2020). To address this limitation, Kaufman (2012) proposed a self-report assessment of five domains of self-report creativity, including self/everyday, scholarly, performance, mechanical/scientific, and artistic creativity. These five factors may be distinguished as empirically separate constructs that may be assessed on a personal level (e.g., seeing obstacles as opportunities, effectively managing interpersonal and intrapersonal relationships), as well as impacting ones' ability to contribute to the arts and science.

Indeed, personality remains an important predictor for general and specific aspects of creativity (Batey & Furnham, 2006). Ruch and Heintz (2019) reviewed research on all aspects of humor as it relates to creativity and discussed the importance of understanding humor and its association with creativity from a variety of perspectives (e.g., humor as a trait or ability). More specifically, the sense of humor can be expressed as a style, representing an individual's typical behaviour (e.g., cheerfulness, predominant mood, aesthetic perception). Humor can also be expressed as maximal behaviour (i.e., humor creativity, humor production), which represents the

skill or competence to create humorous comments that can be measured as quantity (e.g., number of jokes) or quality (i.e., strong agreement content is funny, creative, and witty; Brodzinsky & Rubien, 1976; Ruch & Hofmann, 2012). Humor as an ability could refer to humor delivery, in which the content expressed by the individual is seen as amusing, funny, and/or witty by a variety of people (Hehl & Ruch, 1985). This distinction becomes important in evaluating the literature, as an individual who tends to engage in humorous banter may not be skilled at making good quality jokes (i.e., humor ability). Indeed, Greengross and Miller (2011) found that comedians provided higher quality and quantity of funny cartoon captions compared to undergraduate students. Thus, the ability to spontaneously invent creative and humorous responses in these research settings have predictive validity in an individual's creative achievement in humor production.

In terms of humor ability, Greengross & Miller (2011) found that general intelligence and verbal intelligence both predicted humor production ability, as measured using the funniness of cartoon captions. Greengross and Miller (2011) proposed that findings suggest humor signals superior cognitive skills, which may be advantageous for survival and reproduction. Howrigan and MacDonald (2008) found that general intelligence predicted humor ability, even when controlling for Big Five personality traits. Moreover, the researchers found that intelligence was a better predictor for rater-judged humor than extraversion in males (Howrigan and MacDonald, 2008). However, Hall (2015) found that humor appreciation was positively associated with extraversion over signalling intelligence (Hall, 2015). Humor production was not associated with intelligence and verbal ability as measured by high school and college grade point average (GPA) and American college test (ACT) scores in the study (Hall, 2015). Moreover, humor production on Facebook profiles were associated with extraversion and not intelligence (Hall,

2015). These results suggest personality characteristics play a major role in the creative aspects of humor production.

While there are multiple theoretical frameworks that proposed humor production and creativity are interrelated, no study has examined whether the temperamental basis of humor promotes creativity (Ruch & Heintz, 2019). The state-trait model of cheerfulness is postulated to be central to the temperamental basis of humor that can account for intra- and interindividual differences in exhilaratability (Lau, Chiesi, & Saklofske, 2022). The model postulates that engaging in humor (e.g., as a typical behaviour) characteristically requires a combination of high cheerfulness, low seriousness, and low bad mood. Individuals high in cheerfulness can more easily induce feelings of exhilaration and amusement and tend to maintain a cheerful perspective, presence, and composure both intrapersonally and interpersonally (Ruch et al., 1996). Previous findings suggested that trait serious individuals tended to be rated as low on the quality of humor and tended to use less humorous punchlines (Ruch & Kohler, 1998). Bad mood, which portrays negative affectivity and a sullen mood, tends to hinder the production of positive affect and readiness to engage in humor-related activities (Ruch & Hofmann, 2017).

Previous research suggested that humorous reappraisals may attenuate negative emotions, further suggesting that engagement in humor can help one to cope with distressful experiences (Samson et al., 2014, Strick et al., 2009). According to Lersch (1962), cheerfulness is similar but distinct from the construct of humor, in that the latter is a product of the former (Ruch & Carrell, 1998). Empirical evidence demonstrated trait cheerfulness is widely associated with positive psychological and physical outcomes, including better social competence, emotional regulatory processes, and life satisfaction (López-Benítez, Acosta, Lupiáñez, & Carretero-Dios, 2018; Papousek & Schulter, 2010; Ruch & Hofmann, 2017; Yip & Martin, 2006). Moreover,

Fredrickson's broaden-and-build theory (2004) suggested that exposure to positive affective states expands one's cognitive capacity and flexibility, allowing one to better adapt to changes to one's environment and to daily difficulties (Fredrickson & Branigan, 2005). These findings imply that cheerful individuals may be better equipped to cope with everyday stressors more effectively.

**Studies Overview**

To date, no study has investigated whether the temperamental basis of humor and a cheerful disposition are associated with creativity. The present study aims to investigate this research question in three studies:

The first study examined the relations between humor temperament (i.e., cheerfulness, seriousness, bad mood), and self-report and other-referent ratings of creativity (i.e., judges' and individual ratings of creativity, consisting of wit, originality and humor). Previous findings suggested that humor production is associated with creativity (Kovac, 1999; Ziv, 1980) and humor may be a facet of creativity (Vangundy, 1984). The present study is the first, to the authors' knowledge, to examine if the temperamental basis of humor facilitates creativity (Ruch & Heintz, 2019). Fredrickson's broaden-and-build theory (2004) suggests that positive emotions expand one's thinking and actions, which is conducive to enhancing creativity. Cheerfulness is characterized by having a lighthearted overall outlook and composure, which predisposes one to humor and laughter in the face of challenges (Ruch et al., 2019). Cheerfulness could, therefore, facilitate creative thoughts and behaviours. Bad mood may signal external threat or paucity of psychological resources psychologically and physiologically, which may hinder creative thinking in order to allocate resources accordingly (Morris, 2012; Fiedler, 1988). Seriousness may predict a lower level of quality and quantity of humor (Ruch & Kohler, 1998). Participants completed a

creative sentence writing task and blind judges rated each creative sentence on wit, originality, and humor. Importantly, other-report measures of creativity were used to reduce concerns with common method variance from usage of self-reported measures taken by the same participants (Podsakoff & Organ, 1986).

The second study examined whether those high on trait cheerfulness coped with every day stressors more effectively. Everyday creativity is characterized as knowing oneself and one's ability to manage social settings and everyday happenings. The construct encompasses an individual's understanding of their own desires and capacities, their ability to understand, communicate, and interact with others effectively, as well as how well they deal with their environment and everyday occurrences (Gardner, 2000; Kaufman, 2012). In study two, participants completed the STCI trait version and a task to describe how they resolved a recent conflict or difficult situation in their life. Five research assistants rated how well the individual coped with stress and conflict. This task investigates whether temperamental basis of humor traits are associated with coping with stressors in a more effective way (i.e., defined as part of "everyday creativity" defined by Kaufmann [2012]). Given that cheerfulness is characterized by viewing adverse life circumstances in a composed manner and adopting a cheerful mood and interaction style, cheerfulness may be positively associated with everyday creativity. Likewise, bad mood may be negatively associated with everyday creativity.

The third study examined the associations between STCI variables, comic styles, and judges' ratings of originality, wit, and use of humor in a humor related task. Ruch and Heintz (2019) commented that while O'Quin and Derks (1997) reported positive correlations between humor production and creativity, the review did not control for covariates such as positive affect, intelligence, and optimism. Humor creation and creativity require both quality and novelty

(Kaufman & Kozbelt, 2009). Thus, the third study addresses this gap in the literature through assessing whether the temperamental basis of sense of humor and comic styles are associated with more creative and humorous responses. More specifically, in study three, participants completed the Humor Response Task and were asked to provide the most humorous response possible (i.e., humor ability). It is hypothesized that cheerful individuals will provide more lighthearted humor responses and not mockery styles of humor.

## METHODS

### *Study 1*

#### *Participants*

The sample consisted of undergraduate students (*N*=620; 64% females) enrolled in a large university in Canada recruited to participate in this study online using Qualtrics, a web-based survey tool. Students' ages ranged from 17 to 38 years (*M* = 18.81, *SD* =2.15). In terms of country of birth, 431 were born in Canada (69.3%), 20 were born in United States (3.2%), and 169 were born outside of North America (27.5%). In terms of ethnicity, 274 identified as European White (43.4%), 9 identified as Hispanic (1.4%), 15 identified as Black (2.4%), 4 identified as Native American (0.6%), 240 identified as Asian/Pacific Islander (38.0%), and 79 identified as “other” (e.g., biracial) or preferred not to say (12.5%).

#### *Measures*

***Humor Temperament.*** The standard version of the State Trait Cheerfulness Inventory – Trait Version (STCI-T60) measures three dimensions of cheerfulness, seriousness, and bad mood (Ruch, Köhler, & van Thriel, 1996). The STCI-T60 demonstrated strong internal reliability and test-retest reliability, as well as structural, concurrent, and predictive validity (Hofmann, Carretero-Dios, & Carrell, 2018; Ruch et al., 1996; Ruch & Hofmann, 2017). The measure is

comprised of 60 items utilizing a four-point scale (1 = *strongly disagree*, 4 = *strongly agree*). Bayesian single-test reliability analyses with MacDonald's ω demonstrated acceptable reliability for all three subscales ($\omega_{cheerfulness}$= .91; $\omega_{seriousness}$=.79; $\omega_{bad\ mood}$= .92)

***Kaufman Domains of Creativity Scale (K-DOCS)***. The K-DOCS is a 50-item multidimensional measure of five factors of creativity using a five-point (1= much less creative, 5 = much more creative) scale (Kaufmann, 2012). Bayesian single-test reliability showed acceptable reliability with MacDonald's ω for all five creativity domains: everyday (ω = .79) , scholarly (ω = .81) , performance (ω = .84) , science (= .82), and art (ω = .85). As suggested by Kaufman (2012), the questions were presented in a randomized order for all participants.

***Flourishing.*** Flourishing was measured using the reliable and validated eight-item flourishing scale (Diener et al., 2010). Participants evaluated each item on a seven-point Likert-type scale, ranging from 1 = strongly disagree to 7 = strongly agree. Bayesian single-test reliability analysis demonstrated acceptable reliability (MacDonald's ω = .79).

***Creativity Task.*** Creativity was assessed using Zhu and colleagues' (2009) linguistic creativity measure. Participants were provided with ten common words (i.e., sun, water, warm, eating, money, tasty, sea, beautiful, pain, fun) and were instructed to "try to write a creative sentence about each keyword" (Van Tilburg, Sedikides, & Wildschut, 2015). Given the large number of sentences to rate, a total of 186 participants' responses (for a total of 1860 sentences) were randomly selected for judges to rate. Not all 620 participants' responses were randomly selected for judges to rate, but rather a subset of 186 participants' responses from the total of 620 responses. All responses were linked to an anonymous identification code. A total of 5 judges, unaware of study hypotheses, participants' demographic variables, or participants' scores in personality scales, coded the sentences for creativity in each response: wit "how witty do you

consider this sentence to be?" (1 = not at all, 5= very much), originality "How original do you consider this sentence to be?" (1 = not at all, 5= very much), and humor "to what extent did the individual use humor in their sentence?" (0=no evidence of humor, 1= little humor, 2= some humor/lots of humor). Each participants' score on each category was a sum of the category score of the 10 sentences. Judges were provided specific instructions on a standardized rubric that was modified for this task based on a standardized version provided by Ruch and Heintz (2019). A copy of the rubric can be found in Supplemental Materials 1.

**Data Analysis**

Bayesian Pearson's correlation tests were conducted between humor temperament, self-report creativity, and judges' rating of wit, originality, and humor for the sentences (JASP Team, 2018). Jeffreys's Bayes Factor (1961) described the observed data using a priori and posterior distribution, which allows quantification of evidence in favor of the alternative and null hypothesis (Ly, Verhagen, & Wagenmakers, 2016; Wagenmakers, 2007). Bayes Factors for evidence of alternative hypotheses can be interpreted with 1–3 as weak, 3–10 as substantial, 10–30 as strong, 30–100 as very strong, and >100 as decisive (Jarosz & Wiley, 2014). All tests were conducted under a default uniform prior using JASP 0.14. Intraclass correlations were conducted on SPSS version 26.

***Study Hypothesis***

First, it is hypothesized that cheerfulness is positively associated with self-report self/everyday creativity and scholarly creativity. Second, it is hypothesized that self/everyday creativity mediates the association between cheerfulness and flourishing. Finally, it is hypothesized that cheerfulness and bad mood are not associated with creativity. Moreover, seriousness is hypothesized to be associated with less creative responses.

## *Results*

Descriptive statistics and Bayesian correlations of the study variables were computed (**Table 1**). Cheerfulness was positively associated with self/everyday creativity ($r$= .49; $BF_{10}$ >100; decisive evidence) and scholarly creativity ($r$= .15; $BF_{10}$>30; very strong evidence). There was substantial evidence that cheerfulness was positively correlated with performance creativity ($r$= .12; $BF_{10}$>3). Seriousness was positively associated with self/everyday creativity ($r$= .24; $BF_{10}$>100; decisive evidence), scholarly creativity ($r$= .21; $BF_{10}$>100; decisive evidence), and mechanical creativity ($r$= .14; $BF_{10}$>10; very strong evidence). Bad mood was negatively associated with self/everyday creativity ($r$= -.36; $BF_{10}$>100; decisive evidence) and scholarly creativity ($r$= -.12; $BF_{10}$>3; substantial evidence). There was no evidence for other associations between humor temperament and self-report creativity.

## *Mediation Analysis*

Descriptive statistics and correlations of cheerfulness, self/everyday creativity, and flourishing were computed (**Supplemental Materials 2**). This is the first study to explore the role of cheerfulness and self/everyday creativity in enhancing flourishing, defined a state of optimal positive psychosocial functioning (Diener et al., 2010), which contributes to the literature on achieving this optimal state of wellbeing. No significant deviations concerning linearity, homogeneity, and homoscedasticity were observed. Zero order correlation analyses showed cheerfulness was positively associated with self/everyday creativity and flourishing. Schoemann and colleague's (2017) algorithm to estimate sample size and statistical power for complex path analytic models with indirect effects using Monte Carlo simulations was conducted. Findings showed a power value of .96 when using $N$ = 620, 1,000 number of replications, and 1000 Monte Carlo draws per replication.

A mediation effect model was tested in which self/everyday creativity was the mediator and trait cheerfulness and flourishing were the predictor and outcome, respectively (**Figure 1**). A bootstrapping procedure with 1,000 new samples taken from the current sample and confidence intervals were computed using a bias-corrected percentile method (Biesanz, Falk, & Savalei, 2010). The total amount of variance accounted for by the overall model was 44.2%. The total effect of cheerfulness on flourishing was significant [*(β* = .07, *SE* = .004, BCa 95% CI (.07, .08), $p < .001$]. The direct effect of cheerfulness on flourishing [$\beta$ = .06, *SE* = .004, BCa 95% *CI* (.051, 0.07), $p < .001$] and indirect effect of cheerfulness [$\beta$ =.01, SE=.002, BCa 95% CI = (.01, .02), $p < .001$] were significant (see **Figure 1** for a path analysis diagram).

***Creativity Ratings***

Ratings were calculated for consistency across the judges for each rated response. ICC for judges' agreement were as follows: .93 [.91, .94] for originality, .82 [.78, .86] for wit, and .92 [.90, .94] for humor. Ratings on originality, wit, and humor were not associated with age or sex. There was weak-to-no evidence that cheerfulness, seriousness, and bad mood were associated with judges' ratings of originality, wit, and humor. Descriptive statistics and bivariate correlations are found in **Table 2**. There was substantial evidence that originality ($r$=.22, $BF_{10}$=5.70) and wit ($r$=.22, $BF_{10}$=6.75) were positively associated with performance creativity. There was no evidence that judges' ratings of originality, wit, or humor were associated with other forms of creativity.

**Discussion**

The first study investigated the associations between humor temperament (i.e., cheerfulness, seriousness, bad mood), self-report creativity, and judges' rating of creativity (i.e., wit, originality, humor). The first hypothesis was supported, in which cheerfulness was

positively associated with self-report self/everyday and scholarly creativity. Kuiper et al. (1992) found evidence that high sense of humor (i.e., as a trait) was associated with positive affect for positive events and these individuals maintained a high level of positive affect when facing adversities. Consistent with these findings, the second hypothesis was supported in which self/everyday creativity partially mediated the association between cheerfulness and flourishing. These findings suggest that cheerfulness leads to increased self/everyday creativity, which is conducive to flourishing, and that the underlying mechanism behind the relationship between cheerfulness and flourishing is that of self/everyday creativity. This highlights that self/everyday creativity plays a key role in cheerful individuals' achievement of a state of flourishing, and further suggests the benefits of researching ways in which self/everyday creativity can be enhanced in future studies. Findings indicate potential to further research cheerfulness, self/everyday creativity, and flourishing variables with more methodological rigor. These results also suggested that cheerful individuals may experience greater self/everyday creativity in their interpersonal relationships (e.g., getting people to feel more relaxed or at ease and provide greater emotional support for others and manage relationships more effectively; Ruch & Hofmann, 2017), which aligns with the construct of self/everyday creativity in of itself as it is often defined as a form of interpersonal intelligence and involves one's ability to understand, communicate, and interact with others effectively (Gardner, 2000; Kaufman, 2012).In relation to Fredrickson's broaden-and-build theory (2004), having a cheerful state of mind may enhance one's cognitive flexibility which may also help an individual in better managing their everyday relationships with others. Moreover, seriousness was associated with self/everyday, scholarly, and mechanical creativity. Indeed, creativity may manifest in individuals who are both playful and demonstrate discipline (Csikszentmihalyi, 2013).

The hypothesis that cheerfulness and bad mood are not associated with judges' ratings of creativity and humor was supported. Humor traits typically represent typical behaviour (i.e., habitual) as opposed to maximal humor creation quality (Ruch & Heintz, 2018). Previous studies found the quantity (i.e., not quality) score in a humor production task was predicted by creativity, humor temperament (cheerfulness, seriousness, bad mood), and general intelligence (Ruch & Heintz, 2018). There was weak evidence seriousness was associated with less wit and originality. These results are somewhat consistent with previous findings that suggested seriousness predicted less punchlines (i.e., quantity in humor) and punch lines ratings written by individuals who scored high in seriousness were rated as less humorous (i.e., quality of humor; Ruch & Kohler, 1998). Seriousness may be a predictor for less wit, as seriousness predicts a lack of interest in engaging in humorous interactions or engaging in playful interactions (Feingold & Mazzella, 1991; Ruch, 2012).

### *Purpose of Study Two*

Creativity is defined as the ability to create original and useful ideas that can be used to generate creative solutions and helping others (Feist, 1998; Richards and Kinney 1990; p.209). Study one found strong associations between cheerfulness and self-report self/everyday creativity. It is important to use a different approach that complements self-report data and provide further evidence for the results. The purpose of study two was to investigate whether humor temperament was associated with creativity in everyday life.

### *Methods*

### *Participants*

Participants consisted of university students ($N$ = 439; 64.5% female) averaging 19.05 years of age ($SD$ = 1.78 [range 16, 36]) enrolled in a large university in Canada recruited to participate in

this study online using Qualtrics, a web-based survey tool. In terms of proficiency in the language, English is the first language of 73.8% of the sample and 94% of the sample identified their English as proficient to very proficient.

### *Measures*

***Humor Temperament.*** Description of the STCI-T60 were mentioned in study one. For this study, Bayesian single-test reliability analyses with MacDonald's ω demonstrated strong reliability for all three subscales ($\omega_{cheerfulness}$= .92; $\omega_{seriousness}$=.80; $\omega_{bad\ mood}$= .91)

***Activities and Stress Writing Task.*** Participants were instructed the following: "please describe activities or events in the past week that come to your mind and how you felt doing them." Five judges were asked upon reading each response: "Based on this information, to what extent would you agree to the statement: This person is able to cope with stress well." Each judge rated the responses on a five-point scale (1= Strongly Disagree; 5= Strongly Agree). This exercise does not prompt the writer to specifically describe stress or conflict.

***Managing Conflict Writing Task.*** Participants were instructed the following: "Please describe how you resolved a recent conflict or difficult situation in your life." Upon reading the participant's response, judges were asked the following: "how effective did this person resolve the recent conflict or difficult situation?" Ratings were provided on a five-point Likert-type scale (1= not effective/ ineffective; 5 = very effective). This exercise prompted the writer to specifically write out how they coped with a situation.

### **Data analysis**

Bayesian Pearson's correlations between self-report ratings and judge ratings were performed to quantify the evidence for the null and alternative hypotheses (Wagenmakers et al., 2018). The

default prior for fixed effects was used. Results were replicated when age and gender were controlled for as covariates. As such, results were presented without covariates.

## Results

### Judges Agreement

The sample of judges consisted of five research assistants blind to the study hypotheses and rated 439 statements (i.e., one provided by each participant). Intraclass Correlations (ICC) were used to evaluate the inter-rater agreement between judges' agreements on whether "this person is able to cope with stress well" (Shrout & Fleiss, 1979). ICC values on the stress and managing conflict tasks were .79 [.71, .84] and .83 [.81, .86], respectively, demonstrating acceptable agreement amongst judges.

### *Bivariate Correlations*

Descriptive statistics and Bayesian Pearson's correlations are presented in **Table 3**. Results demonstrated that cheerfulness was associated, with decisive evidence of alternative hypothesis, with judges' ratings that the individual coped with stress better ($r$=.23; $BF_{10}$ >100) and demonstrated greater effectiveness in solving the conflict ($r$=.19; $BF_{10}$ >100). There was weak-to-no evidence that seriousness was associated with better management of stress ($r$=.11; $BF_{10}$ <1) or conflict ($r$=.12; $BF_{10}$ >1). Bad mood was negatively associated with better management of stress ($r$=-.29; $BF_{10}$ >100; decisive), but not conflict ($r$=-.13; $BF_{10}$ >1; weak evidence).

### *Discussion*

Numerous studies demonstrated that positive affect may facilitate the production of novel and useful ideas (Amabile, Barsade, Mueller, & Staw, 2005; Isen, Daubman, & Nowicki, 1987; Greene & Noice, 1988). Consistent with self-report findings in study one, study two findings showed strong support that trait cheerfulness predicted better coping with stress in everyday

situations and how well an individual dealt with a difficult situation or conflict. Individuals who are cheerful may have a more optimistic evaluation towards life and perceive threats less negatively (Ruch & Hofmann, 2017). Moreover, individuals who are cheerful may have a more optimistic evaluation towards themselves which facilitates behavioural activation (Lau et al., 2020).

Individuals who scored high on trait seriousness were not rated as being capable of coping effectively with everyday stressors in study two which contrasted with our findings from study one where trait seriousness was associated with everyday creativity. These findings may be due to differences between the described conflict resolution strategies used by individuals who scored high on trait seriousness compared to those who scored high on trait cheerfulness. For instance, managing a difficult interpersonal relationship may involve confronting the issue directly in a calm and collected manner with another for an individual high on trait seriousness, while an individual high on trait cheerfulness might deal with the same situation by interpreting it less seriously, "letting go of the problem" and simply laughing it off. Although both are effective conflict resolution strategies that involve self/everyday creativity, the more "lighthearted" strategy used by those high in trait cheerfulness may be interpreted as a more effective strategy than the former employed by those high on trait seriousness.

Indeed, Yip and Martin (2006) suggested that serious individuals are just as competent as more playful individuals at effectively handling conflict, asserting themselves, offering emotional support, and self-disclosing. In addition to being more capable of managing interpersonal conflicts, providing emotional support, self-disclosing, and initiating relationships than more ill-humored individuals, those with more playful and less serious outlooks on life tended to be more willing to take interpersonal risks in a playful manner. Conversely, the trait of

bad mood was negatively associated with social competence and emotional management ability (Yip & Martin, 2006).

Some research has suggested it is humor-related states (e.g., watching a comedy film) that induce creativity (Isen, Daubman, & Nowicki, 1987). For bad mood, the generation of positive affect is impaired by the presence of predominant negative affective states (Ruch & Hofmann, 2017). Moreover, positive mood state was found to be greater in the number of ideas generated, as well as the flexibility of ideas (Zenasni & Lubart, 2002). Indeed, the cognitive tuning model posits that an individual's cognitive system and physiological responses adjust according to personal feelings of safety and danger (Morris, 2012). That is, bad mood indicates a real or imagined presence of external threats or a lack of psychological resources, while cheerfulness implies a "safe" and welcoming overtone (Fiedler, 1988; Schwarz, 1990). The former activates the parasympathetic nervous system and allocates resources to allow the body to conglomerate its resources for survival (Field, 2016). As such, bad mood would be suboptimal for creativity. In addition, creativity is related to self-reflection, which is associated with a penchant for rumination that may cause symptoms of depression (Verhaeghen, Joormann, & Khan, 2005). More specifically, brooding, a form of self-reflection characterized by negative mood and associated with creative behavior, was linked with a greater risk for depression (Verhaeghen, Joormann, & Aikman, 2014).

**Purpose of Study 3**

Study one found that humor temperament was not associated with more humorous responses in their creative writing task. One limitation was that participants were not prompted to provide a humorous response. Study three aims to address this limitation by examining the associations between STCI variables, comic styles, and judges' ratings of originality, wit, and use of humor in

a humor-related task. It is hypothesized that cheerfulness and bad mood are positively associated with the use of lighthearted humor responses and mockery styles of humor, respectively. In terms of comic styles, it is hypothesized that fun, wit, and humor would be associated with more lighthearted humor use, originality, and wit in responses (Ruch, Heintz, Platt, Proyer, & Wagner, 2018).

**Study 3**

Participants consisted of university students (*N*=234 ; 74.7% female) averaging 18.14 years of age (*SD* = 1.15 [range 17, 25]). Participants identified as the following: European White (*n*=99; 41.9%), Asian/Pacific Islander (*n*= 88; 37.3%), and other (*n*=49 e.g., Hispanic, Black, mixed race).

**Measures.**

**Humor temperament**. Information regarding the STCI-T60 was discussed in study one. Bayesian single test reliability demonstrated strong reliability for the three subscales: cheerfulness (ω = .92), seriousness (ω = .80), and bad mood (ω = .91).

**Comic Styles.** The Comic Style Markers (CSM; Ruch et al., 2018) is a self-report reliable and validated questionnaire consisting of 48 marker items utilizing a seven-point response format from 1 (strongly disagree) to 7 (strongly agree). Bayesian single-test reliability with MacDonald's ω demonstrated acceptable reliability for all eight styles: fun (ω = .75), humor (ω = .70), nonsense (ω = .75), wit (ω = .80), irony (ω = .64), satire (ω = .68), sarcasm (ω = .77), and cynicism (ω = .77).

**Humor Task.** Participants completed Howrigan and McDonald's (2008) email task. Participants were asked to imagine they had received an email from a fellow student for a school project on the diversity of humorous responses: (1) "If you could experience what it's like to be a different

kind of animal for a day, what kind of animal would you not want to be, and why?" (2) "How would you make a marriage exciting after the first couple of years?" (3) "What do you think the world will be like in a hundred years?" Participants were also instructed to provide the most humorous response possible. A total of 14 raters, unaware of study hypotheses, coded the content for creativity on the item: witty "How witty do you consider this response to be?" (1=not at all, 5=very much), originality "How original do you consider this response to be?" (1=not at all, 5=very much), and use of lighthearted and mockery styles of humor "to what extent did the individual use humor in their sentence?" (0=no evidence of humor, 1= little humor, 2= some humor/lots of humor). All raters were provided a modified version of a coding scheme (see Supplemental Material 4) for rating originality and wittiness of study participants' responses (Ruch & Heintz, 2018).

## Results

### Judges' Ratings

Intraclass correlations of judge's ratings of "originality," "wittiness," "lightheart humor," and "mockery humor" were .95 [.94, .96], .96 [.95, .96], .94 [.93, .95], and .93 [.92, .95], respectively.

### STCI and Humor

Descriptive statistics and Bayesian correlations are shown in Supplementary Materials 5. Cheerfulness was negatively associated with mockery style of humor ($r$=-.21, $BF_{10}$>10; strong evidence). There was no evidence that cheerfulness was associated with originality, wittiness, and lighthearted humor. There was no evidence that seriousness and bad mood were associated with any of the judges' ratings.

### Comic Styles and Humor

Descriptive statistics and Bayesian correlations are shown in **Table 4**. The comic style humor was associated with judges' ratings of lighthearted humor ($r$=.21, $BF_{10}$>10) originality ($r$=.23, $BF_{10}$>30), and wit ($r$=.21, $BF_{10}$>10). The comic style nonsense was associated with judges' ratings of lighthearted humor ($r$=.29, $BF_{10}$>100), mockery ($r$=.23, $BF_{10}$>30), originality ($r$=.29, $BF_{10}$>100), and wit ($r$=.30, $BF_{10}$>100). Judges' ratings were not associated with the following comic styles: fun, irony, wit, sarcasm, satire, and cynicism.

## Discussion

Contrary to our hypotheses, trait cheerfulness was not associated with lighthearted humor, originality, or wittiness. This finding suggested that a cheerful disposition may not predict that an individual will be employing lighthearted humor, originality, or wit in the process of humor production. Indeed, the aforementioned studies found that cheerfulness was positively associated with self/everyday creativity in self-reported (study one) and other-reported (study two) findings. Interestingly, the trait of cheerfulness is negatively associated with mockery style of humor. Lau, Chiesi, Hofmann, Saklofske, & Ruch (2020) found that cheerfulness predicted less negative tone in words used, but not a more positive tone. Perhaps trait cheerfulness predicts a lack thereof in negativity rather than predicting positivity in interaction. Moreover, given cheerful individuals tend to maintain composure and a positive presence within oneself and one's interpersonal relationships, using a mockery style of humor characterized by maliciousness, superiority, and an intention to hurt others would not align with a cheerful individual's disposition (Ruch et al., 1996). It would rather be counterproductive to the cheerful individuals' propensity towards creating an amusing and exhilarating environment conducive to positive relations with oneself and peers. This supports the finding in study three that the trait of cheerfulness is negatively associated with mockery humor.

Study three also revealed that the comic style humor is related to other-referent ratings of lighthearted humor, originality, and wit, while nonsense humor is associated with other-referent ratings of lighthearted humor, mockery humor, originality, and wit. Similarly, Heintz (2019) found positive relationships between wit with rated humour, wit, and originality. Perhaps the temperamental basis of humor may not precisely predict wittiness and originality in humor production as well as the comic styles humor and nonsense.

Next, judges' ratings were not associated with the fun, irony, wit, sarcasm, satire, and cynicism comic styles. Generally, indicators of creativity (originality and wit) and of positive humor (lighthearted) were found to be associated with the nonsense and humor comic styles, which are related to emotional strengths (i.e., zest, hope, bravery) and agreeableness (Ruch et al., 2018). Conversely, sarcasm, satire, and cynicism are negatively related to agreeableness and sarcasm and satire were positively related to emotional strengths (Ruch et al., 2018), suggesting that the ratings of originality, wit, and lighthearted and mockery styles of humor differed in comic styles depending partially on the raters' interpretations of the participants' agreeableness and emotional strengths via their statements, with use of lighthearted humor indicative of more prosocial and interpersonally beneficial characteristics (e.g., agreeableness and emotional strengths) and use of mockery humor indicative of less prosocial characteristics.

## General Discussion

Overall, the present study investigated whether humor temperament is related to certain aspects of creativity, such as originality and wit, through incorporating multiple elements of other-referent elements of creativity with self-report measures. Few studies have used other-referent elements of creativity, and this method may mitigate concerns with common method

variance from self-report measures completed by the same respondents (Podsakoff & Organ, 1986). Individuals may also tend to internalize and overgeneralize positive aspects of themselves and to associate negative aspects with external factors (Greenberg, Pyszczynski, & Solomon, 1982). Other-referent measures of creativity not only provide creativity ratings from another's viewpoint, but also establish converging evidence for one's creativity and for more accurate and impartial ratings of an individual's creativity (Ruch & Heintz, 2019).

The first study explored the relation between the temperamental basis of humor (i.e., cheerfulness, seriousness, bad mood) and both self-reported and judges' ratings of participants' creativity (i.e., wit, originality, humor). Findings from study one suggest that both cheerfulness and seriousness were positively associated with self-reported self/everyday (i.e., effectively problem solving one's way through daily problems) and scholarly creativity (i.e., thinking outside-the-box when it comes to creative analysis, debate, and scholarly pursuits), which supports Csikszentmihalyi's (2013) suggestion that individuals who display playfulness, discipline or both can all be creative. Consistent with study one, study two also found that individuals high in cheerfulness coped with everyday stressors more effectively than those scoring lower on cheerfulness using the peer rating task, further solidifying the link between trait cheerfulness and self/everyday creativity. Study one and two findings are supported by Fredrickson's broaden-and-build theory (2004) which suggests that exposure to positive affective states helps to expand our cognitive capacity and flexibility, and this enables individuals to better adapt to daily stressors and changes in their environment. Lau and colleagues (2020) have also suggested that cheerful individuals tend to have more optimistic views of themselves which encourages self-esteem and behavioural activation. Ruch and Hofmann (2012) have suggested

that cheerful individuals tended to problem-solve and cope more effectively with daily stressors and difficulties.

Study one also found that cheerfulness was related to flourishing through self/everyday creativity (partial mediation). These results highlight the importance of trait cheerfulness in enhancing one's ability to solve everyday problems and consequently allows one to feel a sense of thriving and fulfillment in life. This is supported by the theory of "interpersonal emotion regulation" which posits that one's positive mood and behaviours can help regulate another's (Zaki & Williams, 2013).

Notably, there were negative associations between bad mood and self/everyday and scholarly creativity ratings (study one), which suggested that an overtone of unrelenting gloominess creates difficulties in thriving under everyday and scholarly activities. Positive affect may facilitate one to ideate and think more flexibly (Zenasni & Lubart, 2002), while negative affectivity may deplete an individual's psychological resources, subsequently diminishing creative cognitive processes (Field, 2016; Fiedler, 1988; Schwarz, 1990). Bad mood is also associated with brooding, a form of self-reflective rumination that hinders creativity (Verhaeghen, Joormann, & Aikman, 2014).

Study two findings revealed that individuals who scored high on trait seriousness were not rated as coping more effectively with daily difficulties, which is inconsistent with study one. These results may be reflective of the nature of other-referent reports of creativity in study two compared to the self-reports in study one. An individual who is serious may be less likely to use a lighthearted and relaxed approach when managing everyday problems at hand due to their serious nature (Ruch et al., 1996). As such, the serious individual may be managing a daily conflict with ease, however, this earnest and humorless approach may be perceived as less

creative compared to an individual who manages these problems in a playful and lighthearted manner (i.e., someone who is cheerful). Furthermore, in study three, it was revealed the comic styles humor or nonsense were perceived as more lighthearted, witty, and original to blind judges. On the other hand, cheerfulness was not found to be associated with lighthearted humor, originality, or wit in study three.

Taken together, trait cheerfulness is positively associated with self/everyday creativity or one's ability to manage everyday stressors and conflicts, in self and other-referent reports. There was no evidence that cheerful individuals wrote more creative sentences or provided more witty, original, or lighthearted humor in humor-related tasks.

Findings could be applied for future research in the contexts of therapy, education/mentorship, and business. Given that deficits in cognitive flexibility have been associated with depression and anxiety (Gabrys et al., 2018), suicidal ideation (Lai et al., 2018), and eating disorders (Tchanturia et al., 2012), it would be beneficial to further investigate whether using lighthearted statements and humor can help create a cheerful mindset and environment that is conducive to creativity and cognitive flexibility in a therapeutic setting and whether or not this aids in developing a strong therapeutic alliance. It may also be of interest to investigate whether increasing self/everyday creativity, through a variety of cognitive trainings that encourage divergent thinking such as symbolic relations, divergent figural transformations and divergent semantic relations (Cropley, 2016), also increase one's cheerfulness. Additionally, conducting research on various daily activities that have the potential to increase self/everyday creativity (e.g., various artistic endeavours, endeavours that involve problem solving and critical thinking, etc.), which may in turn increase one's cheerfulness could have positive implications to improving upon one's quality of life. Next, findings suggest that creating a more encouraging

and cheerful environment may be useful in settings that require students to be creative. In other words, supervisors and educators should not only give their students time and flexibility to be creative, but also to reward and reinforce their students for taking up tasks that lead to innovative solutions, such as allowing them to test-run ideas that may not work in the end. This may be more effective than training models following more behaviourist approaches which involve only encouraging students when work is done correctly or only providing feedback when work is completed poorly. Indeed, Csikszentmihalyi (2015) has suggested the importance of devoting time and energy to forming an encouraging environment for children to promote their creative pursuits and overall development. In addition, rather than focusing purely on productivity, firms that want to encourage the generation of more creative and new ideas (e.g., start-ups) and employee wellbeing may benefit from giving employees more free time and time to engage in activities that promote cheerfulness. Employers may consider hiring more employees than needed to complete tasks that keep the company afloat so that employees are able to have more flexibility in their schedules to engage in creative pursuits rather than purely productive ones (Markman, 2015). This extra time and flexibility could be spent learning new skills, having conversations with colleagues that help generate new ideas, and trying "napkin sketch" ideas.

**Limitations**

The three studies are not without limitations. First, participants were not provided a time limit for the writing tasks and it is unclear how long each participant spent on each task. Hence, the amount of effort or timeliness of the response were unaccounted for. Second, whereas in everyday interactions humor serves a specific function (e.g., facilitate laughter amongst peers), there was no incentive for humor production as an anonymous participant in a study. Next, there are multiple ways to exhibit creativity in a task whether it is assessed through indicators (e.g.,

quantity, quality) or modality (e.g., verbal, written, figural, physical; Ruch & Heintz, 2018). The present study only assessed for the self-report indices and creativity evaluation of written responses to a prompt. Future studies should examine other modalities of humor. Moreover, few past studies have assessed the reliability of the Howrigan and McDonald's (2008) email task. Additionally, self-peer convergence for self/everyday creativity was not assessed, which presents itself as another limitation of the present research. Finally, Ernstheiterkeit (i.e., a German for cheerful and serious state) may be a desirable quality that is associated with greater levels of creativity (Lau, Chiesi, & Saklofske, 2020; Proyer & Rodden, 2013). Future studies should investigate whether individuals who are both cheerful and serious exhibit greater creativity. Taken together, trait cheerfulness is positively associated with self/everyday creativity or one's ability to manage everyday stressors and conflicts, in self and other-referent reports. Having a cheerful disposition may allow individuals to engage in more effective coping strategies and management of everyday problems.

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