



Full Length Article

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Funny and meaningful: media messages that are humorous and moving provide optimal consolation in corona times

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Abstract: During the first months of the corona crisis, people worldwide produced and shared thousands of uplifting (e.g., humorous, moving) media messages. The six studies reported here empirically tested the consolatory effects of viewing such positive media messages in the US, The Netherlands, and the UK. I compared the impact of humorous and moving (i.e., touching, heartwarming) messages, as they provide different kinds of well-being: hedonic versus eudaimonic. Studies 1–3 had correlational designs. Largely in line with the hedonic versus eudaimonic well-being framework, the results suggested that humorous messages lift people’s spirits by providing pleasure, while moving messages lift people’s spirits by providing realism, optimism, and by illustrating core human values. Studies 4–6 used a pre- and post-measure of negative and positive emotions. The results showed that viewing non-moving humorous messages significantly reduced negative emotions but did not increase positive emotions. Viewing non-humorous moving messages reduced negative emotions and increased positive emotions in the US and UK, but not in The Netherlands. Finally, viewing messages that are both humorous and moving reduced negative emotions and increased positive emotions in all samples, implying they are particularly valuable as mood-enhancers during crises. The practical and theoretical implications of these findings are discussed.

Keywords: coping; COVID-19; emotion regulation; hedonic and eudaimonic well-being; humor

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1 Introduction

Imagination was given to man to compensate him for what he is not; a sense of humor to console him for what he is.

– Francis Bacon

The rise of the COVID-19 (corona) virus ignited the production and sharing of a global stream of corona jokes via social media. Preliminary content analyses indicated that the jokes produced in different countries seemed similar (Kuipers 2020); perhaps because people experienced the same quarantine-related problems worldwide. Most jokes were about the minor inconveniences and irritations of the quarantine, not about the disease itself, or about ill people or their loved ones. Consequently, corona jokes tended to be good-natured (Kuipers 2020).

Besides corona jokes, people also exchanged moving corona messages that were optimistic and heartwarming, yet non-humorous. One such message reported that the air was cleaner than ever because people traveled less, causing the peaks of the Himalayas to be visible again. Another reported that for the first time in ages, the canals in Venice were bright blue and full of fish and nesting ducks (although this statement was questioned later). Other moving stories, often labeled “corona kindness” were about people running errands, playing music, or baking bread for those in need in their neighborhoods.

In April and May 2020, I investigated the consolatory effects of corona-related humorous and moving messages among residents of the US, The Netherlands, and the UK. More specifically, I measured the extent to which humor and being moved decreased negative emotions and increased positive ones. In the remainder of the introduction, I will first review findings on the mental state of people in the US, Europe and UK during the first phase of the pandemic. Then, I discuss research on humor and being moved as coping mechanisms and discuss the value of comparing them. Next, I present six empirical studies on the consolatory effects of humor and being moved. Finally, I discuss the theoretical and practical significance of the findings.

1.1 Global mental health during the corona crisis

The pandemic led to a worldwide increase in mental health problems such as stress, anxiety, anger, and insomnia (Torales et al. 2020). In a tracking poll conducted by the Kaiser Family Foundation (KFF) in mid-July, 53% of adults in the United States reported their mental health had declined due to worry and stress over the coronavirus, a marked increase compared to the 32% reported in March,

when this question was included in KFF polling for the first time. Moreover, many individuals indicated they attempted to cope with these problems through alcohol and substance use (e.g., Da et al. 2020).

In Europe, significant drops in well-being were observed as well. Survey research in April (Allas et al. 2020) indicated that the pandemic had caused a decline in life satisfaction compared to pre-corona times across the continent, including the UK, from 6.7 to around 6.3 (0 meaning “not satisfied at all” and 10 “fully satisfied”). Lowered incomes and higher unemployment played a role, but health and relationship concerns were more important contributors. Across Europe, the proportion of people who reported feeling lonely “most or all of the time” increased from 6 to 17 percent during the pandemic.

Pierce et al. (2020) surveyed 17,452 individuals from the UK Household Longitudinal Study, one of the largest panel surveys in the world. The survey was conducted at the end of April, and the researchers compared the results to pre-corona trends. The results showed that the occurrence of clinically significant levels of mental distress rose from 18.9% in 2018–2019 to 27.3% in April 2020. Furthermore, the average level of reported distress increased significantly in both women and men, and in each age group, but the greatest increases in distress were found among the 18–24-year-old and 25–34-year-old, women, and people living with young children.

The World Health Organization (WHO 2020) advised people (among other things) to share positive and hopeful news, for example, messages about people helping each other, recovering from illness, or applauding for health care providers. One of the ways people attempted to deal with the situation, as mentioned, was by producing and sharing corona jokes and memes.

1.2 Humor as coping mechanism

Many experiments have shown that humor lowers anxiety and increases well-being in times of crisis (for a review, see Martin and Ford 2018, and see Morgan et al. 2019 for a recent addition). In a typical experiment on humor as a coping mechanism, researchers induced stress by asking research participants to watch emotionally upsetting photos or films, perform a frustrating task, or anticipate a stressful exam or electric shocks. Before, during, or after the stress manipulation, participants were instructed to generate a humorous response to the situation, or were exposed to humorous audiotapes, videos, cartoons, or poems. In the control condition, participants received the same stress manipulation and a parallel but non-humorous treatment (e.g., they generated a serious or non-humorous positive response). The general finding in such experiments is that humor works better to

downregulate negative emotions (e.g., anxiety, stress) or upregulate positive emotions (e.g., hope, interest) compared to the control condition.

Confirmative evidence for humor as coping mechanism has been found in correlational studies on real life crises (for a review, see Martin and Ford 2018). For example, Cherry et al. (2018) examined US noncoastal and coastal residents exposed to the 2005 Hurricanes Katrina and Rita and the 2010 Deep water Horizon oil spill. They found that the use of coping humor (among other things) was associated with higher self-reported resilience (i.e., the ability to “bounce back”) in the years after these successive disasters.

Humor helps to cope with stress via various mechanisms. Jokes grab attention and stimulate thought. This cognitive activity temporarily distracts from negative thoughts, making people feel lighter and happier (e.g., Strick et al. 2009). The inherent surprises and mismatches found in humor may also trigger a cognitive change, helping people to reappraise stressful events in less threatening ways (Samson and Gross 2012; Samson et al. 2014). Humor can also serve as interpersonal emotion regulation strategy. By producing positive humor, people can increase intimacy and thereby regulate their partner’s mood (Horn et al. 2019). Furthermore, cracking jokes and laughing together helps people to share experiences and collectively make sense of what is going on (e.g., Tracy et al. 2006).

However, this does not mean all types of humor are equally effective. Studies show that only positive humor (i.e., sympathetic, tolerant, and benevolent amusement), not negative humor (i.e., laughing at situations in hostile, superior ways) buffers against the negative emotional impact of emotionally disturbing pictures (Samson and Gross 2012). The negative impact of work stressors on work-related flow was found to be *stronger* to the extent employees engage in cynical (i.e., bitter, distrustful) humor (Van Oortmerssen et al. 2020). Furthermore, self-enhancing humor, but not self-defeating humor, was effective at alleviating the anxiety associated with taking a stressful math test (Ford et al. 2017).

1.3 Being moved as coping mechanism

Besides humorous messages, people exchanged more serious, optimistic, moving messages during the corona crisis. Examples are news items about students volunteering as cooks, nannies or zookeepers for people working in health care, or the story of a fitness instructor in Seville who gave free sports lessons to people in quarantine from a roof terrace. Being moved is a distinct emotion that may be accompanied by a warm feeling in the chest, moist eyes or tears, chills, or feeling “a lump in one’s throat” (see Zickfeld et al. 2019, for a review). Varying ideas about the elicitors of the emotion exist, such as critical life events and significant relationships

(Menninghaus et al. 2015), the sudden intensification of communal sharing relationships (Fiske et al. 2017), or manifestations of core values such as kindness, courage, and humanity (Cova and Deonna 2014; Strick and van Soolingen 2018).

Emerging research on media use demonstrates the impact of moving entertainment media on the replenishment of depleted cognitive and emotional resources (e.g., Reinecke and Oliver 2017). In this framework, being moved is associated with purpose in life, mastery and control, personal growth, and the activation of central values (Wirth et al. 2012). For example, recent experiments showed that watching moving (inspiring) YouTube videos, compared to watching funny videos, increased meaningful affect which in turn predicted greater meaning, focus, and vitality at work (Janicke-Bowles et al. 2019). The meaningful affect elicited by moving videos also predicted mastery recovery experiences, which in turn predicted vitality (Janicke-Bowles et al. 2018). Consequently, people may choose moving media entertainment to elevate their psychological well-being (Oliver and Raney 2011; Prestin and Nabi 2020).

1.4 Hedonic and eudaimonic well-being

Humor and being moved map onto two types of well-being that psychologists distinguish: hedonic and eudaimonic, or in more vernacular terms: pleasure and meaning (Ryan and Deci 2001). Hedonic well-being is associated with fun, feeling light and carefree. Examples of characteristic hedonic activities are eating out, bursting into laughter, or wild lovemaking. Eudaimonic well-being is associated with deeper fulfillment and purpose in life. People may experience it when they engage in significant activities like raising a child, running a marathon, or caring for a sick person.

By providing levity in times of crisis, corona humor likely provides hedonic well-being. Of course, not all humor is meaningless or lighthearted. Humor and political satire can be significant and provide severe social criticism (Baumgartner and Lockerbie 2018; Davis et al. 2018). Still, most corona jokes with their clowning, banter, and fun nonsense seemed to add lightness to an otherwise gloomy time of illness, death and scarce IC beds.

As moving corona messages were inspiring and morally uplifting, they likely provided eudaimonic well-being. In contrast to humor, these messages are not lighthearted. In fact, one could argue that the spontaneous humanitarian actions they portray illustrate the gravity of the crisis, rather than provide levity.

Whereas some people tend to seek entertainment media to increase their hedonic well-being, others tend to seek entertainment media that provide eudaimonic well-being (Oliver and Raney 2011). Apart from a personality difference, preferences for entertainment media vary within individuals depending on the circumstances.

For example, being confronted with one's own mortality causes individuals to become more reflective and search for meaning beyond their individual existence (Goldenberg et al. 1999). Based on this notion, one may predict that moving messages are especially attractive to people in times of existential crisis, as they provide a sense of purpose and significance (see also Oliver and Raney 2011).

Here, I compared the impact of humorous, moving and “moving humorous” corona messages on well-being. I also examined mediators of the potential uplifting effects of humor and being moved. Based on the hedonic and eudaimonic well-being framework, one may expect that the uplifting effect of humor is mediated by pleasure (not meaning), whereas the uplifting effect of being moved is mediated by meaning, realism, optimism, and the manifestation of core human values.

This research contributes to the scientific literature in several ways. It provides a new framework for analyzing the value of humor as a coping strategy. Previous research indicated that eudaimonic well-being is more strongly related to overall well-being than hedonic well-being (Steger et al. 2008). The current research may provide evidence that “moving humor” has a greater consolatory potential than “non-moving humor”. Furthermore, the research contributes to the scientific literature on eudaimonic and hedonic well-being by experimentally comparing the consolatory effects of moving, humorous and “moving humorous” media messages, and by applying the framework to the new context of coping with the corona crisis.

1.5 The present research

In six studies I compared the consolatory effects of humor and being moved, and I contrasted them with messages that are both humorous and moving. An example of the latter category is a news message about a Chicago aquarium park that allowed its penguins to roam freely through the park during the corona lockdown. The penguins curiously waddled past tanks of piranhas, stingrays and dolphins, and they were completely mesmerized by the aquarium with sharks. Another example was about an Easter press conference where New Zealand Prime Minister Jacinda Arden confirmed the Easter bunny is an essential worker and should be allowed to perform services during the lockdown. These news stories are not classical jokes with a set up and punch line. Yet, the research participants found them humorous (see Section 3.1.2). At the same time, they found them moving, likely because they illustrated kindness, inventiveness and humanity.

The studies are presented according to two research stages: Studies 1–3 had correlational designs and explored the relations between humor, being moved, and cheering people up. They also explored potentially mediating psychological variables. Studies 4–6 experimentally compared the uplifting effects of

humorousness, being moved, and their combination using pre- and post-measures of negative and positive emotions.

The selected humorous and moving media messages were taken from social media and news platforms in various countries during the corona crisis (e.g., Facebook, Twitter, boredpanda.com, theguardian.com, elle.com). Across the studies, I used a set of 48 different stimuli that fitted my research goals, varied in style and content, and addressed a range of aspects of the corona crisis. The studies were reviewed and approved by the Ethics Review Board of the Faculty of Social and Behavioral Sciences of Utrecht University. All data and materials are freely available on the website of the Open Science Framework: https://osf.io/qwsf4/?view_only=19d2fdcd40304248a6983c14878e6a4f The studies were conducted online on Prolific.ac, a platform for recruitment and administration of online tasks and questionnaires (Palan and Schitter 2018). Prolific takes care of the recruitment by sending out e-mail notifications to eligible participants who are registered on the platform. Registered participants can also see currently available studies that they are eligible for on the Prolific website.

2 Studies 1–3

2.1 Method

2.1.1 Participants and design

Studies 1–3 were posted on Prolific on April 7, April 10, and April 11, respectively, under the title “Uplifting stories in corona times”. The description read “You get to see 24 (or 12) pictures. You rate the extent to which they cheer you up, and whether you think they are funny and moving”. Participants were also informed of the reward and the number of minutes it would take to complete.

Based on an estimated medium effect size ($\beta = 0.30$) and 0.80 statistical power, Studies 1–3 required a minimal sample size of $N = 85$ (Hulley et al. 2013). I opted for $N = 100$ for each study. One-hundred-and-one US individuals (41 men, 59 women, 1 non-binary; $M_{\text{age}} = 31.50$ ($SD = 10.27$, range 18–74 years) participated in Study 1 on April 7. One-hundred-and-one US individuals (49 men, 50 women, 2 non-binary; $M_{\text{age}} = 33.37$ ($SD = 11.73$, range 18–68 years) participated in Study 2 on April 10. One-hundred US individuals (43 men, 56 women, 1 non-binary; $M_{\text{age}} = 29.82$ ($SD = 10.05$, range 17–71 years) participated in Study 3 on April 11.

After filling out demographic questions but before observing the humorous and moving stimuli, participants rated their current worry (“How worried are you about the COVID-19 outbreak at this point?”) on a 5-point Likert scale ranging from 1

“Not worried at all” to 5 “Extremely worried”). Their responses indicated considerable worry in Study 1: $M = 3.43$ ($SD = 0.98$); Study 2: $M = 3.55$ ($SD = 1.00$), and Study 3: $M = 3.34$ ($SD = 0.89$). The studies had correlational designs.

2.1.2 Materials

In Study 1, participants were presented with 24 corona-related pictures representing a mix of non-moving humorous (e.g., a photo of a horoscope containing identical predictions for all Zodiac signs, namely “You’ll be spending time in your home”), non-humorous moving (e.g., a news item with photo of people applauding for healthcare workers), moving humorous (e.g., a news item with photo of the penguins exploring the Chicago aquarium closed due to corona), and non-humorous non-moving (i.e., control) stimuli (e.g., a photo showing a close-up of the corona virus). Study 2 and 3 used similar materials but the number of stimuli was reduced to 12 and the control stimuli were omitted.

2.1.3 Procedure

Participants were informed they would see a series of pictures and were asked to evaluate how uplifting, funny and moving they found each of them. Then, participants clicked through the 24 stimuli, that were presented in random order, at their own pace. Below each stimulus were three questions: “Does this cheer you up?” (Uplifting effect); “Do you find the picture funny?” (Humorousness); and “Does the picture move you?” (Being moved). Participants responded on Likert scales ranging from 1 “Not at all” to 5 “A great deal”. Finally, participants were given the opportunity to leave remarks about the research and were thanked for their participation.

The procedures of Studies 2 and 3 were similar to that of Study 1, with some exceptions. For consistency with the statements measuring potential mediators, the questions were replaced by statements (e.g., “The picture cheers me up”). The statements measuring mediators in Study 2 were “The picture gives me pleasure” (pleasure); “The picture shows something meaningful” (meaning); “The picture shows a scene taken from real life” (realism); and “The picture feels morally incorrect” (immorality). The statements measuring mediators in Study 3 were “The scene is surprising” (surprise); “It depicts a value I care deeply about” (core values); “It makes me optimistic” (optimism). Pleasure, meaning, realism, core values, and optimism were related to hedonic and eudaimonic well-being (Oliver and Raney 2011). The other mediators (immorality and surprise) were included for exploratory reasons.

A further addition in Study 3 was that, after the measurement of worry but before the presentation of the stimuli, frustrated needs for autonomy, competence, and relatedness were assessed. Recently, Tamborini et al. (2010) argued that people seek media entertainment to fulfill basic needs of autonomy, competency, and relatedness (Ryan et al. 2008). Based on the notion that some or all of these basic needs may be frustrated by the corona quarantine, and based on idea that media messages may fulfill deeper human needs (Oliver and Raney 2011), I explored whether humorous or moving messages were more attractive or uplifting depending on the level of need frustration. The analysis of the results showed that none of the three needs interacted significantly with the uplifting effect of humor or being moved, $F_s < 1.10$, $p_s > 0.295$. In other words, the uplifting effects of humor and being moved do not depend on the level of need frustration. For the sake of brevity, need frustration will not be discussed further (but the full results are available via the link to the Open Science Framework). The assessment of need frustration was omitted in Studies 4–6.

2.2 Results and discussion

I used Linear Mixed Models in SPSS 25 to estimate the predictive effect of humorousness and being moved across all stimuli while adjusting for correlation due to repeated observations on each participant (IBM Corp. 2013). *B*-values are reported to indicate the direction and size of the predictive effects.

In Study 1, humorousness and being moved were entered as continuous fixed factors, and stimulus (24 levels) as repeated measures factor. Intercepts of the regression lines were allowed to vary randomly across participants. The results showed that both humorousness, $B = 0.57$, $t(1736.40) = 52.18$, $p < 0.001$, and being moved, $B = 0.52$, $t(1847.01) = 38.42$, $p < 0.001$, positively predicted the uplifting effect.

Study 2 and 3 used similar analyses but stimulus had only 12 levels. Replicating Study 1, Study 2 showed that both humorousness, $B = 0.55$, $t(1,031.12) = 29.57$, $p < 0.001$, and being moved, $B = 0.48$, $t(1,028.70) = 24.37$, $p < 0.001$, positively predicted the uplifting effect. Likewise, the results of Study 3 showed that both humorousness, $B = 0.41$, $t(1,012.63) = 21.36$, $p < 0.001$, and being moved, $B = 0.47$, $t(1,080.09) = 22.60$, $p < 0.001$, positively predicted the uplifting effect. These results provide consistent evidence that greater feelings of humor and being moved relate to a stronger uplifting effect.

The mediation analyses provided insight into the psychological variables underlying these relations. I used the MLmed macro developed by Rockwood and Hayes (2017) to conduct multilevel mediation analyses. I performed 14 different mediation analyses to estimate the indirect effects of the seven potential mediators

(i.e., pleasure, meaning, realism, immorality, surprise, core values, and optimism) on the relations between humorousness and the uplifting effect, and being moved and the uplifting effect, respectively. The results are depicted in Table 1. They imply, as expected, that pleasure mediated the uplifting effect of humorous stimuli. Thus, humorous stimuli are uplifting because – and to the extent that – they provide pleasure. The analysis further showed that pleasure also mediated the uplifting effect of moving stimuli. As expected, realism, optimism, and core values positively mediated the uplifting effect of moving (not humorous) stimuli. Thus, moving stimuli are uplifting because – and to the extent that – they are realistic, optimistic and illustrate core human values.

In contrast to what the hedonic and eudaimonic well-being framework would suggest, meaning did not mediate the uplifting effect of movingness. However, humor had a *negative* relation with meaning. Meaning, in turn, related positively to well-being. These results suggest that the uplifting effect of humor is limited by its lack of meaning. To the extent the humorous stimuli were less meaningful, they were less helpful to lift people's spirits.

Table 1: Mediators on the relation between humorousness and the uplifting effect, and the relation between movingness and the uplifting effect.

	Effect on mediator <i>B</i> -value (<i>SE</i>)	Effect of mediator on uplifting effect <i>B</i> -value (<i>SE</i>)	Estimate of indirect effect of mediator <i>B</i> -value (<i>SE</i>)
Humorousness			
Pleasure	0.28 (0.02)***	0.82 (0.02)***	0.23 (0.02)***
Meaning	-0.35 (0.03)***	0.38 (0.02)***	-0.13 (0.01)***
Realism	-0.30 (0.03)***	0.31 (0.02)***	-0.09 (0.01)***
Immorality	-0.04 (0.01)**	-0.46 (0.05)***	0.02 (0.01)**
Surprise	0.15(0.02)***	0.30 (0.03)***	0.05 (0.01)***
Core values	-0.21(0.03)***	0.44 (0.02)***	-0.09 (0.01)***
Optimism	-0.02(0.02)	0.64 (0.02)***	-0.01 (0.02)
Being moved			
Pleasure	0.28 (0.02)***	0.87 (0.02)***	0.25 (0.02)***
Meaning	0.78 (0.02)***	0.02 (0.04)	0.02 (0.03)
Realism	0.67 (0.03)***	0.15 (0.02)***	0.10 (0.02)***
Immorality	-0.08 (0.01)***	-0.45(0.05)***	0.04 (0.01)***
Surprise	0.27 (0.03)***	0.26 (0.03)***	0.07 (0.01)***
Core values	0.64 (0.02)***	0.20 (0.03)***	0.13 (0.02)***
Optimism	0.49 (0.02)***	0.60 (0.03)***	0.30 (0.02)***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The exploratory mediation analyses further showed that surprise mediated the uplifting effects of both humor and being moved. Thus, humorous and moving stimuli are uplifting because – and to the extent that – they provide surprise. Finally, immorality negatively mediated the uplifting effects of movingness and humor-ousness, which suggests that humor and being moved are only uplifting when they are considered moral (or, more precisely, not considered immoral). This illustrates a boundary effect for uplifting stimuli in corona times: to the extent the public perceives humorous or moving messages as immoral, they will not lift their spirits.

In summary, the results of Studies 1–3 confirmed that the uplifting effect of humor is mediated by pleasure and the uplifting effect of being moved is mediated by realism, optimism and the manifestation of core human values. The analyses did not confirm that the uplifting effect of being moved is mediated by meaning. Rather, the analysis implied that meaninglessness limits the uplifting effect of humor. Thus, these results suggest that the value of humor as a coping strategy could be improved by enhancing meaning. Studies 4–6 therefore tested media messages that are both moving and humorous, which presumably are more meaningful.

We cannot draw causal conclusions based on Studies 1–3, as they had correlational designs. Studies 4–6 tested the causal effects of humor and being moved using a pre- and post-measure of negative and positive emotions. These studies compared the uplifting effects of corona-related non-moving humorous, non-humorous moving, moving humorous, and non-moving non-humorous moving media messages.

3 Studies 4–6

3.1 Method

3.1.1 Participants and design

Studies 4–6 were posted on Prolific on May 20, May 24/25, and May 29, respectively, under the title “Uplifting stories in corona times”. The description read “You get to see pictures/stories. For each picture, you are asked to indicate how you appreciate it in COVID-19 times”. Participants were also informed of the reward and the number of minutes it would take to complete.

A pilot test (posted on the Open Science Framework) was used to determine the effect size of Studies 4–6. The smallest effect size was $d_z = 0.40$, which indicated that at least $N = 52$ was needed per condition to reach 0.80 statistical power (Faul et al. 2009). I opted for $N = 60$ per condition. Two-hundred-and-forty-two US individuals (125 men, 117 women; $M_{\text{age}} = 34.01$ ($SD = 11.71$, range 18–74 years) participated in Study 4 on May, 20. Two-hundred-and-forty-four Dutch individuals

(144 men, 100 women; $M_{\text{age}} = 28.28$ ($SD = 10.08$, range 17–74 years) initially participated in Study 5 on May 24. However, when the results of Study 5 diverged somewhat from the results of Study 4 (see Section 3.2), I included another 102 Dutch individuals (61 men, 40 women, 1 non-binary; $M_{\text{age}} = 28.20$ ($SD = 9.34$, range 15–76 years) on May 25 to confirm the robustness of these diverging findings. Adding the extra participants did not change the pattern or significance of the results. Therefore, I only report the results of the full sample ($N = 346$). Two-hundred-and-forty-one UK individuals (76 men, 164 women, 1 non-binary; $M_{\text{age}} = 34.25$ ($SD = 13.18$, range 18–74 years) participated in Study 6 on May 29.

The studies had a mixed design with stimulus type as between participants factor with four levels (non-moving humorous vs. non-humorous moving vs. moving humorous vs. non-moving non-humorous) and repeated measures on positive and negative emotions.

3.1.2 Materials

Study 4 used 48 stimuli, 12 non-moving humorous (e.g., a picture of Jesus having the Last Supper on his own, with the disciples calling in via Zoom), 12 non-humorous moving, (e.g., a picture of kids playing cello for a self-isolating elderly neighbor), 12 moving humorous (e.g., a news item about New Zealand's Prime Minister Jacinda Ardern declaring the Easter Bunny an essential worker), and 12 non-moving non-humorous (i.e., control, e.g., a Top 5 of things to do at home during self-quarantine) stimuli. A cluster analysis on the humorousness and movingness ratings of these stimuli, using Akaike's information criterion as the clustering criterion and log-likelihood as distance measure, confirmed that the stimuli fell into four clusters (see Figure 1, top panel). The same stimuli were used in Study 5 and Study 6 and the cluster analyses re-confirmed the four clusters (see Figure 1, middle panel and bottom panel, respectively).

3.1.3 Procedure

In Study 4, after the demographic questions, participants completed the pre-measure of positive and negative emotions. For each emotion, they indicated to what extent it described how they felt about the COVID-19 pandemic at that moment. The positive emotions scale was validated in a previous study on positive emotions during crises (Fredrickson et al. 2003), but slightly adapted to the current pandemic. The emotions were: joyful, amused, calm, content, interested, moved, inspired, grateful, hopeful, proud, connected. The negative emotions scale was derived from Fredrickson et al. (2003) and the Positive and Negative Affect Schedule (Watson et al. 1988), supplemented with negative emotions that were

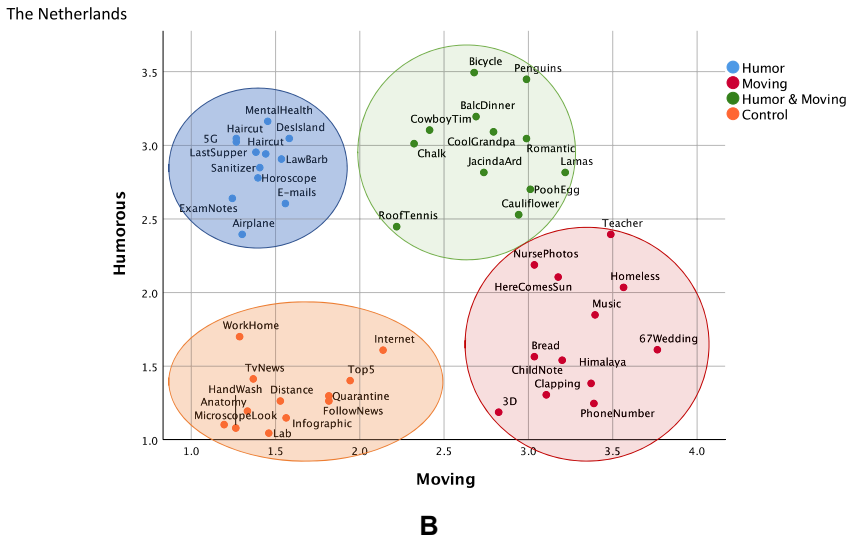
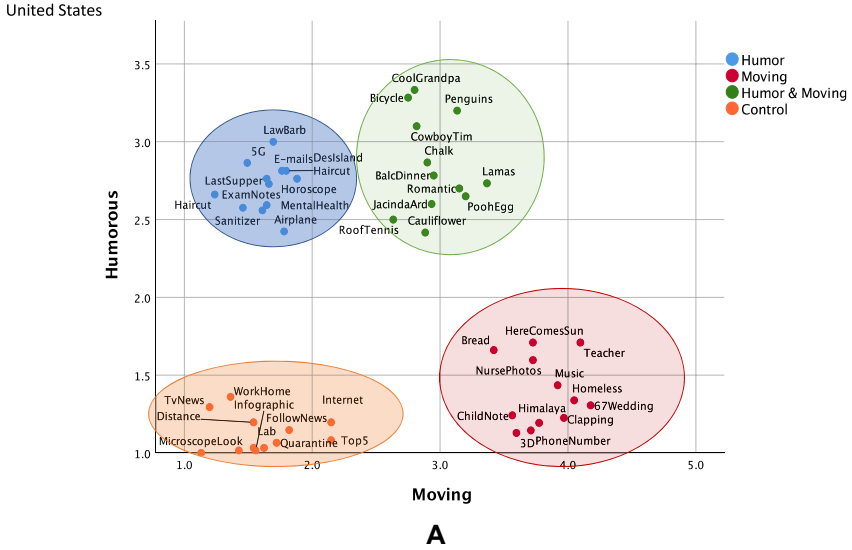


Figure 1: Clusters of non-moving humorous (blue), non-humorous moving (red), moving-humorous (green), and non-humorous, non-moving stimuli (orange) in Study 4 (top panel), Study 5 (middle panel) and Study 6 (bottom panel).

United Kingdom

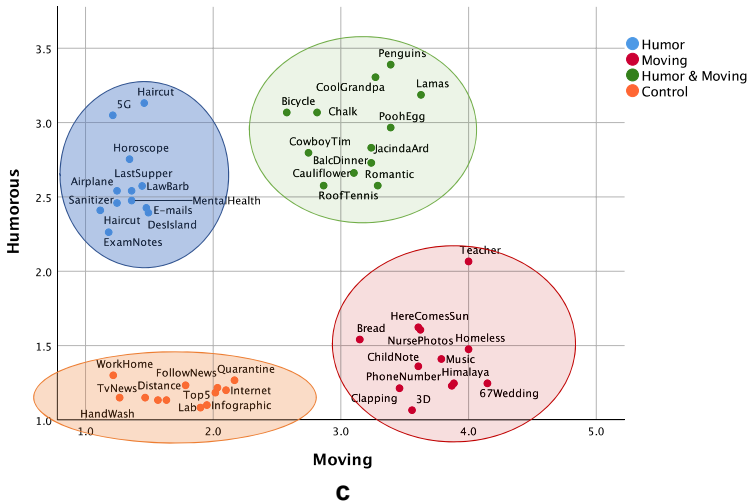


Figure 1: continued.

particularly relevant during self-quarantine (e.g., bored). The emotions were: angry, hostile, sad, lonely, afraid, hopeless, anxious, irritated, guilty, ashamed, bored. Participants indicated the extent to which they experienced these positive and negative emotions on Likert scales ranging from 1 “Not at all” to 5 “Very much”. After, participants were given the opportunity to explain their feelings via an open-ended question (“Would you like to explain why you feel this way?”). The positive and negative emotion scales had high reliability across the three studies (i.e., Cronbach’s α ’s between 0.85 and 0.92).

After the pre-measure, participants clicked through the 48 stimuli – presented in random order – at their own pace. They rated the humorousness and movingness of each stimulus. The statements were adjusted to reflect that some stimuli were stories, not pictures (e.g., “The picture/story is funny”). Then, they completed the post-measure of positive and negative emotions, which was identical to the pre-measure.

After the post-measure, participants were again presented with all 48 stimuli in random order, and they evaluated the content of each picture/story on a scale ranging from 1 “Very negative” to 5 “Very positive”. This measure was added to better understand potentially diverging consolatory effects of the four stimulus types.

Finally, participants were given the opportunity to leave remarks about the research and were thanked for their participation.

The procedure of Studies 5 and 6 was similar. However, because the positive emotion ‘moved’ overlapped with the experimental manipulation of being moved, I

replaced this emotion by the more general ‘positive’ in Studies 5 and 6. Furthermore, the negative emotion ‘ashamed’, although used in previous studies (i.e., Fredrickson et al. 2003; Watson et al. 1988), was replaced by the more general ‘negative’. The results are reported for the complete data (i.e., including moved and ashamed in Study 4, and positive and negative in Study 5 and 6). Removing these emotions from the analyses did not change the pattern or significance of the results.

In Study 5, after the post-measure of emotions, instead of rating the negativity/positivity of the stimuli, participants evaluated the hopefulness of each picture/story on a scale ranging from 1 “Not hopeful at all” to 5 “Very hopeful”. This measure was added to better understand potentially diverging consolatory effects of the four stimulus types. In Study 6, this evaluation was omitted.

3.2 Results

The results are presented in Table 2¹ and can be summarized as follows. Across the US, Dutch and UK samples, non-moving humorous stimuli significantly decreased negative emotions. Thus, being exposed to corona jokes has demonstrable consolatory effects. However, the non-moving humorous stimuli did not increase positive emotions. In other words, corona jokes served as downregulator of negative emotions, but not as upregulator of positive emotions.

In contrast, non-humorous moving stimuli significantly decreased negative emotions and increased positive emotions, but only in the US and UK samples. In other words, in US and UK participants, moving stimuli served as downregulators of negative emotions and upregulators of positive emotions. However, the pattern in The Netherlands was somewhat different. Here, non-humorous moving stimuli significantly decreased negative emotions but did not increase positive emotions. I return to this difference between the samples in the Discussion.

Importantly, across the three samples, moving humorous moving stimuli significantly decreased negative emotions and increased the experience of positive emotions. Thus, humorous stimuli that were also moving generally served as downregulators of negative emotions and upregulators of positive emotions.

The control stimuli decreased negative emotions, but also significantly reduced positive emotions in all three samples. Thus, as expected, and unlike the other three types of stimuli, the control stimuli were not uplifting overall.

¹ Given the high reliability of the emotion scales, only the aggregate results of the positive and negative emotion scales are reported here. The results of each specific positive and emotion can be inspected via the link to the Open Science Framework mentioned earlier.

Table 2: Impact of humor and moving stimuli on negative and positive emotions.

- = Negative emotions drop
- = Positive emotions rise
- = No change
- = Positive emotions drop

	Humor			Moving			Humor & Moving			Control			
	M (SD) Pre	M (SD) Post	T-value	M (SD) Pre	M (SD) Post	T-value	M (SD) Pre	M (SD) Post	T-value	M (SD) Pre	M (SD) Post	T-value	
US (N = 242)	Negative emotions	2.24 (0.66)	1.88 (0.64)	-5.81***	2.10 (0.74)	1.84 (0.71)	-6.14***	2.32 (0.81)	2.06 (0.83)	-5.36***	2.22 (0.85)	2.13 (0.95)	-2.14*
	Positive emotions	2.62 (0.71)	2.70 (0.73)	1.22	2.55 (0.71)	2.97 (0.90)	5.72***	2.62 (0.62)	2.80 (0.67)	2.96**	2.41 (0.78)	2.20 (0.82)	-4.84***
NL (N = 346)	Negative emotions	2.30 (0.67)	2.14 (0.77)	-4.11***	2.45 (0.70)	2.19 (0.69)	-6.54***	2.42 (0.63)	2.20 (0.68)	-6.80***	2.49 (0.64)	2.34 (0.67)	-4.28***
	Positive emotions	2.98 (0.72)	2.95 (0.80)	-0.60	2.87 (0.68)	2.94 (0.66)	1.24	2.90 (0.71)	2.98 (0.76)	2.00*	2.80 (0.63)	2.70 (0.65)	-2.41*
UK (N = 241)	Negative emotions	2.30 (0.77)	2.10 (0.76)	-3.92***	2.33 (0.79)	2.10 (0.82)	-4.38***	2.38 (0.74)	2.16 (0.83)	-3.76***	2.48 (0.83)	2.38 (0.81)	-2.16*
	Positive emotions	2.78 (0.86)	2.77 (0.85)	-0.11	2.91 (0.73)	3.12 (0.79)	3.36**	2.88 (0.72)	3.02 (0.72)	2.17*	2.67 (0.70)	2.52 (0.77)	-2.77**

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The evaluation of negativity/positivity and hopefulness provided additional information to understand these diverging consolatory effects. The results of Study 4 showed that participants rated the content of non-humorous moving stimuli as most positive ($M = 4.28$, $SD = 0.41$), followed by the moving humorous ($M = 4.06$, $SD = 0.42$), control ($M = 3.24$, $SD = 0.43$), and non-moving humorous ($M = 3.09$, $SD = 0.47$) stimuli. Post hoc tests showed that the positivity of all stimulus types differed significantly from each other ($ps < 0.008$), except for the control and non-moving humorous types ($p = 0.072$).

The results of Study 5 showed that participants rated the content of non-humorous moving stimuli as most hopeful ($M = 3.61$, $SD = 0.50$), followed by the moving humorous ($M = 3.46$, $SD = 0.47$), control ($M = 2.94$, $SD = 0.51$), and non-moving humorous ($M = 2.31$, $SD = 0.47$) stimuli. Post hoc tests showed that the hopefulness of all stimulus types differed significantly from each other ($ps < 0.001$), except for the non-humorous moving and moving humorous types ($p = 0.061$).

Thus, the moving stimuli (humorous and non-humorous) were more positive and hopeful than the non-moving (humorous and non-humorous) stimuli. In fact, the non-moving humorous stimuli (i.e., the corona jokes) were rated less positive and hopeful than the control stimuli. Their positivity did not differ from the neutral midpoint of the scale ($p = 0.130$), and their hopefulness scored below the midpoint ($p < 0.001$). The practical and theoretical implications of these findings will be discussed in the next section.

4 General discussion

During the corona pandemic, people in all parts of the world produced and exchanged corona-related humorous and moving messages, supposedly to cope with the stress accompanying the crisis, and to elevate their own and others' positive mood. The present research tested whether observing these stimuli actually helped to downregulate negative emotions and upregulate positive ones. The findings confirmed that non-moving humor (i.e., corona jokes) significantly reduced negative emotions across US, Dutch, and UK samples, but did not increase positive emotions. Non-humorous moving stimuli served to both downregulate negative emotions and upregulate positive ones in US and UK participants, but in the Dutch sample they only served to decrease negative emotions. Finally, moving humorous stimuli decreased negative emotions and increased positive emotions in all samples, indicating that this type of humor was particularly helpful as coping strategy during the crisis.

Additional analyses suggested that humor and being moved both play emotion regulation functions, albeit via partly different psychological mechanisms. Non-moving humor was effective because it was surprising and pleasurable. Moving

messages, in addition, were effective because they showed scenes from real life, were optimistic, and illustrated core human values. Moreover, the moving messages were generally more positive and hopeful than the non-moving messages, including non-moving humor, which may explain their strong consolatory effects.

These findings contribute to the scientific literature by illustrating the value of the hedonic and eudaimonic well-being framework for analyzing humor as a coping strategy, and by showing the promising consolatory effects of “moving humor”. Future research may dive deeper into this type of humor to better understand its nature and uplifting effects. Furthermore, the research adds to the scientific literature on eudaimonic and hedonic well-being by experimentally comparing media messages providing eudaimonic and hedonic well-being and contrasting them with media messages combining the two, and by using the framework to provide solutions for improving mental health during the corona crisis.

It was remarkable that the Dutch participants did not appreciate non-humorous moving stimuli as much as the US and UK participants did. One explanation may be that at the time of Studies 4–6, the corona situation looked brighter in The Netherlands than in the US and UK. At the time of study, the infections and death rates had greatly declined in The Netherlands, and the government had just announced plans to lift corona measures (e.g., re-open high schools, public transport, restaurants, and bars). In the US, the infection and death figures were still on the rise and President Trump was defending his use of hydroxychloroquine, an unproven medicine, to cure the virus (Yeung et al. 2020). In the UK, the death registration figures had dropped but government scientific advisers warned of the risks associated with lifting lockdown restrictions (Boseley 2020). The depressing situation in the US and UK may have caused a preference for soberness in the participants from these countries, whereas the brighter perspective in The Netherlands may have caused a preference for lightheartedness (Goldenberg et al. 1999; Oliver and Raney 2011).

The lower appreciation for non-humorous moving messages among the Dutch may also be explained culturally. Although the national stereotype is not grounded in research, the Dutch are known as down-to-earth and upbeat people who prefer humor over drama. Future research may investigate differential preferences for humor or moving messages by measuring additional mediating mechanisms such as individual differences in cheerfulness and seriousness (Ruch et al. 1997) or the general tendency to regulate emotions using suppression or reappraisal (Gross and John 2003). The current findings suggest, however, that humorousness alone was not enough to instill hope and inspiration, even among the Dutch. The combination of humor and being moved provides the best of both worlds: it is meaningful and optimistic without losing playfulness and frivolity. Perhaps for this reason, the Dutch preferred this combination to the non-humorous moving messages.

A limitation of the current research is that the conclusions are based on a limited stimulus set, and hence, we cannot draw firm conclusions about corona jokes and moving messages in general. The global corona humor cycle contains multiple thousands of jokes (Kuipers 2020) and it was impossible to test all – or even most – of the available messages. The current research suggests that the non-moving humor shared during the corona crisis was, albeit good-natured and non-aggressive, not particularly positive or hopeful. However, these conclusions cannot be drawn firmly yet. Future research may provide a more thorough content analysis of corona humor and may also give further insight about the general positivity and hopefulness of these jokes and memes.

Another limitation of the current research is that the studies only addressed short term coping effects. It is unlikely that a single humorous or moving message has long-lasting effects on well-being. However, the impact may be improved if people observe positive messages on a daily basis. Research confirms that a healthy daily media-diet mixing serious and positive news has a robust positive impact on overall well-being (Prestin 2013; Prestin and Nabi 2020). A further question is whether the durability of the uplifting effect depends on the type of coping message (humorous or moving). Empirical evidence suggests that daily activities aimed at experiencing eudaimonia are more durably associated with overall well-being than daily activities aimed at experiencing hedonia (Steger et al. 2008). Because moving messages elicit eudaimonic well-being, while humor elicits hedonic well-being, one may predict that the effect of moving messages lasts longer. However, it is unwarranted to say that the effects of humor are always short-lived, as studies have shown that humorous coping – especially cognitive reappraisal of adverse circumstances using humor – can be long-lasting (Samson et al. 2014). Future research may also test whether people's stable tendency to seek and share humorous and heartwarming stories relates to higher resilience in times of crisis. Such research may also find out whether effects differ depending on whether one is producing, sharing, or only passively observing these messages.

In this research, I found consistent evidence that observing humorous media messages helped people downregulate their negative emotions in corona times. When the media messages were not only funny but also moving, they additionally helped people upregulate their positive emotions. These insights may help people cope with the corona crisis, and with other bigger and smaller crises in their lives.

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