

Is the news making us unhappy? The influence of daily news exposure on emotional states

Natascha de Hoog*  and Peter Verboon

Faculty of Psychology and Educational Sciences, Open University of the Netherlands, Heerlen, The Netherlands

There is evidence that exposure to negative news is making people feel bad, but not much is known about why this only affects some people or whether this also applies to everyday news exposure. This study examined the direct and indirect effects of daily news exposure on people's affective states. Using ecological momentary assessment (EMA), 63 respondents (24 men and 39 women) reported their news exposure and affective states five times a day for 10 days. In addition, personal relevance of the news and personality characteristics, neuroticism and extraversion, were assessed. Results showed that negative news perceptions were related to more negative affect and less positive affect, and these effects were moderated by personal relevance, but not personality characteristics. The implications of these outcomes are discussed.

These days, news seems to be everywhere. People can be updated about the latest developments in the world during the entire day and seven days a week. News is not only received by television, newspapers, and through online news coverage, but also through social media. Even people who do not follow regular news updates can still be confronted by news events through the people they follow on social media (Kramer, Guillory, & Hancock, 2014). Even though news facts can have positive, neutral, or negative content, the majority of news coverage concerns topics with a negative valence (Haskins, Miller, & Quarles, 1984; Zillmann, Chen, Knobloch, & Callison, 2004), including topics like natural disasters, crime, the bad economy, terrorism, or war. Not only is the majority of news topics negative, people also tend to pay more attention to negative news (Zillmann *et al.*, 2004). In addition, the majority of negative news coverage is directed towards people's emotions (Philo, 2002), and the sensationalism and confronting nature of news coverage have increased drastically over the last decades (Wang, 2012).

All this exposure to negative information about the state of the world is likely to have an impact on our state of mind, our moods, or even our general happiness (Galician, 1986). Surprisingly, not much research has been conducted on this topic. Even though there are many studies on news perception, the focus has mainly been on cognition, with studies looking at information processing and memory (Gerend & Sias, 2009), as well as framing (Sun, Krakow, John, Liu, & Weaver, 2016), and motivation (Lee & Chyi, 2014) or

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

*Correspondence should be addressed to Natascha de Hoog, Faculty of Psychology and Educational Sciences, Open University of the Netherlands, P.O. Box 2960, 6401 DL Heerlen, The Netherlands (email: Natascha.dehoog@ou.nl).

attitudes (Hollbert, Zeng, & Robinson, 2017), while the topic of emotions has received much less attention. When emotions do play a role, studies usually focus on emotions used in news (Brosius, 1993), rather than as an outcome of news exposure.

The studies available on the relationship between news exposure and affect do generally support the notion that exposure to news reports affects our moods and state of mind. More specifically, a direct relationship between negative news exposure and negative emotional states was found in a number of experimental studies (Balzarotti & Cicero, 2014; Johnston & Davey, 1997; Marin *et al.*, 2012; McIntyre & Gibson, 2016; Szabo & Hopkinson, 2007; Unz, Schwab, & Winterhoff-Spurk, 2008; Veitch & Griffitt, 1976). After being exposed to negative news reports, positive affect decreased, whereas negative affect, sadness, worries, and anxiety increased. Other studies have found indirect effects on psychological distress and negative affect through an increase in stress levels and irrational beliefs (McNaughton-Cassill, 2001) or depression (Potts & Sanchez, 1994).

Non-experimental research on the topic has mainly focused on the impact of very severe news events, like terrorist attacks. A study on the Boston Marathon terrorist attack (Holman, Garfin, & Silver, 2014) showed people's stress levels were higher after exposure to news about the attack for four weeks compared to stress levels right after the attack. Similarly, PTSD was found to increase after continuous news exposure about the 9/11 attacks (Ahern, Galea, Resnick, & Vlahov, 2004; Piotrkowski & Brannen, 2002). Similar findings are reported in studies on anthrax attacks (Dougall, Hayward, & Baum, 2005), children exposed to news about terror attacks (Pfefferbaum *et al.*, 2002), and news coverage on infectious diseases like SARS (Hansen, 2009).

Thus, there is empirical evidence that exposure to negative news is making one feel bad, but why is that? Does this also apply to everyday news exposure? And does this affect everyone in the same way? The present research attempts to answer these questions by looking into the direct and indirect effects of daily news exposure on people's emotional states.

Theoretical background

Despite a number of studies on the impact of negative news exposure on emotional states, no theoretical explanation has been proposed for this effect. We postulate that cognitive appraisal theory might be a relevant framework in this context. Negative news can be seen as a stressor that needs to be evaluated and reacted to. As argued by cognitive appraisal theory (Ellsworth & Scherer, 2003; Lazarus & Folkman, 1984), when someone is exposed to a stressor, the stressor is appraised in order to elicit an appropriate emotional response. The cognitive appraisal process consists of two parts: (1) primary appraisal in which one establishes the importance (severity and relevance) of the stressor and (2) secondary appraisal that assesses the ability to cope with the stressor (Lazarus & Folkman, 1984). In other words, when confronted with news reports, someone (1) evaluates the valence and severity of the stressor (e.g., negative and very serious) as well as the extent to which the news affects them (e.g., very relevant) and (2) whether this news is something within or beyond their control (e.g., little control). Together, this determines the affective response that follows.

When it comes to appraisal of news stories, we propose it is mainly primary appraisal that is of importance. Most news events are likely to be perceived as outside the person's control (Kleemans, de Leeuw, Gerritsen, & Buijzen, 2017; Maguen, Papa, & Litz, 2008), making secondary appraisal less relevant to investigate as it is unlikely to vary much from person to person. For example, news about wars, poverty, and the recession are all things

a recipient cannot change or has any influence over. However, people tend to differ in how severe they perceive certain news facts, and they especially differ in personal relevance. This is amplified by later theories of cognitive appraisal (Lazarus, 1991; Smith & Kirby, 2000) that have argued it is mainly the extent to which a stressor is personally relevant to someone that affects the intensity of the emotions elicited by a stressor. The importance of personal relevance was also established in a broad range of studies, showing personal relevance as an important factor when it comes to attention to, processing of, and evaluation of information (Balzarotti & Cicero, 2014; De Hoog, 2013; Van t Riet, Ruiters, & De Vries, 2012). More specially, studies on news perception have found personal relevance to be a moderator of the effect of news valence on affective response (Balzarotti & Cicero, 2014; Marshall *et al.*, 2007).

This corresponds with the notion of information processing theories (Chen, Duckworth, & Chaiken, 1999) that personal relevance is a crucial factor in determining how critical and intensive information is processed and evaluated. In dual process models (Evans & Frankish, 2012), as well as in later versions of cognitive appraisal theory (Lazarus, 1991), the relationship between cognitions and affect is seen as a continuous bidirectional process, wherein cognitions about information affect emotions that in turn affect cognitions about the information. People who are exposed to similar news information on a daily basis can end up in a downward spiral of appraisals leading to negative affect, negative affect leading to more negative appraisals of the news etc., which might explain why studies on continuous exposure to news about terrorist attacks found people felt worse after weeks of exposure than just after the fact (Ahern *et al.*, 2004). It also corresponds with studies showing people who are anxious or depressed are more likely to focus on negative information or information that corresponds with their mental state (Davey & Wells, 2006), which in turn only increases their anxiousness or depression. It has to be pointed out that some studies have found the opposite effect, with people selecting to read news stories that are contrary to their current mood (Biswas, Riffe, & Zillmann, 1994; Kaspar, Ramos Gameiro, & König, 2015).

Even though daily exposure to negative news can affect people negatively, not everyone is affected in the same way. While some people feel the burden of all that is wrong in the world, others seem to be able to brush it off and remain rather unaffected emotionally by the media they consume (Valkenburg & Peter, 2013). Individual differences in the cognitive appraisal process can partly explain this (Gross & John, 2003; Kuppens & Tong, 2010; Scherer, 2001), as studies have shown people with certain traits appraise situations differently and have dissimilar affective responses to stressors (Bolger & Schilling, 1991; Scheier & Carver, 1985; Tong, 2010).

Two personality characteristics that are especially relevant when it comes to appraisal and reactions to negative news are neuroticism (Bolger & Schilling, 1991; Tong, 2010) and extraversion (Gallagher, 1990; Rafienia, Azadfallah, Fathi-Ashtiani, & Rasoulzadeh-Tabatabaie, 2008). Neuroticism is the general tendency to react in an anxious and negative matter to everyday stressors. Neuroticism has been linked to heightened negative affect, anxiety, and fear, as well as a general lower well-being. In addition, neuroticism has been shown to negatively affect the primary appraisal process (Oliver & Brough, 2002), with people high in neuroticism reacting more strongly and negatively to stressors than people low in neuroticism (Bolger & Schilling, 1991; Tong, 2010). Thus, it was expected they would perceive news as more negative and feel more personally affected by it. Extroverts are known to be social, impulsive, optimistic, and easy-going (Sanderman, Arrindell, Ranchor, Eysenck, & Eysenck, 2012). More specifically, extroverts report higher well-being and experience more positive affect and less negative affect than

introverts (Gallagher, 1990; Stafford, Ng, Moore, & Bard, 2010). In addition, extraversion is related to lower stress and fear levels (Penley & Tomaka, 2002). Indirectly, extraversion has been shown to be a moderator in the affective processing of information as well as the influence of affect on cognition (Rafienia *et al.*, 2008; Stafford *et al.*, 2010). Thus, it was expected they would perceive news as less negative.

The present research

So far, studies have shown that exposure to negative news reports can negatively affect one's emotional state, but these studies have mainly been experimental in nature or have focused on very serious events, like terrorist attacks. Not much is known about the effect of daily exposure to everyday news and why some people are more affected by news exposure than others. More research is needed into the possible negative effects of daily news exposure and the conditions under which they occur. Therefore, the present research looks at the direct and indirect effects of daily news exposure on people's emotional states.

The design of the study was derived from ecological momentary assessment (EMA) methodology (Conner, Tennen, Fleeson, & Barrett, 2009), and, to our knowledge, it is the first study that looks at the effects of news perception on emotional states using an intensive longitudinal design. This method uses a structured diary-type set-up used to assess people's thoughts, moods, and the exact context in real time, for a certain period of time, and has been shown to be very effective in capturing people's daily reality (Myin-Germeys *et al.*, 2009). Benefits of this method also include the minimization of bias in recall compared to assessments of mood and emotional states by traditional methods. In addition, compared to experimental studies, this method increases ecological validity, while also being able to assess causal effects.

The aim of the present study was to examine whether daily exposure to negative news would negatively affect people's emotional states. It was also explored whether personal relevance, extraversion, and neuroticism moderated this effect. We expected daily exposure to negative everyday news to affect emotional states. More specifically, we expected a positive relationship between how negative the news was perceived to be and negative affect (and a negative relationship for positive affect; hypothesis 1). In addition, we expected the impact of negative news on emotional states to be stronger when personal relevance is high (hypothesis 2), and for people who score high on neuroticism (hypothesis 3) or low on extraversion (hypothesis 4).

Method

Design

The current study used a longitudinal approach for data collection. Ecological momentary assessments (EMAs) or experience sampling methodology (ESM) was used in order to heighten the ecological validity of the data (Myin-Germeys *et al.*, 2009). Because ESM comprises a high frequency of behaviour assessments using random sampling, which is assessed in the participant's natural environment, ESM studies tend to give realistic representations of the human experience in everyday life (Hektner, Schmidt, & Csikszentmihalyi, 2007; Myin-Germeys *et al.*, 2009). ESM studies typically use a short time interval between a certain event and a participant's assessment, decreasing memory bias especially in comparison with other forms of data collection that involve retrospective reports of behaviour (Myin-Germeys *et al.*, 2009). Moreover, this method

tends to have higher statistical power than most cross-sectional designs, due to the large number of assessments per participant (Palmier-Claus *et al.*, 2011).

Participants

A convenience sample of Dutch adults was recruited by using advertisements in the research team's social neighbourhood. Eighty-five people originally participated in the study. Only participants who filled in the daily questionnaire at least 17 of the 50 times were included in the analyses, which corresponds to at least one third of the possible entries which are required to produce a valid data set in ESM studies (Delespaul, 1995). This left 63 respondents varying in age between 18 and 82 years old: 24 men ($M_{\text{age}} = 49.8$ and $SD = 17.3$) and 39 women ($M_{\text{age}} = 45.5$ and $SD = 14.1$). About 66% of the respondents had higher-level education, 29% middle-level education, and 5% lower-level education. Of the participants, only 2% indicated that they watched, read, or heard daily news on average <5 min per day, 40% between 5 and 30 min, another 40% between 30 and 60 min, and 19% more than 60 min a day. The data for the present study were obtained from 3 to 21 December 2016.

Procedure

Participants were recruited from the researchers' social or work environment. A detailed instruction was given how to download the app (lifedatcorp.com) with which the longitudinal data collection took place, and an access code was provided to download the specific study. Respondents were given a brief description, including information that the study was about daily exposure to news through the media. After giving consent, respondents could continue the first questionnaire by providing age, gender, education level, and how often they perceived news facts in general. Next, questions pertaining to variables stable over time were solicited once (i.e., extraversion and neuroticism). For participants who did not start the questionnaire immediately after downloading it, the questionnaire remained available for 3 days.

The following day, the longitudinal study started. Participants were asked to fill in the short questionnaire in the app, which included questions about whether they had perceived any news reports since the last notification, the type of news they perceived, the valence of the news, their emotions, and appraisals. The questionnaire had to be answered five times a day during 10 days. To remind the participant of the questionnaire, a notification was sent to their mobile devices. The notifications were delivered at quasi-random moments between 8:00 AM and 10:30 PM, with an average interval of 90 min. After each signal, the questionnaire was available for 60 min, after which missing values were recorded for this particular signal.

Instruments

News perception

After every beep, respondents were asked the following question: Have you seen or heard any news reports in the last time period? with a yes/no answer category.

News valence

News valence was derived from a semantic differential using five bipolar dimensions. In an earlier pilot study, these five dimensions were shown to be the best in characterizing the

news out of ten possible dimensions. The dimensions were as follows: dramatic versus ordinary, hopeful versus cynical, disgusting versus pleasant, fearful versus comforting, and inspiring versus discouraging. If participants indicated that they perceived a news fact in the previous period, they could score the valence of this news from 0 to 10 on each of the five scales. The higher the score, the more positive the news was perceived. Factor analysis revealed that these items formed a one-dimensional construct. The five scores were averaged to obtain a one-dimensional news valence scale. The reliability of this scale was high ($\omega = .93$, with 95% CI: [0.92, 0.93]; Peters, 2014).

Type of news

Respondents had to indicate the type of news they had perceived, by selecting one of eight categories: private, work-related, war/terrorism, disasters/accidents, sports, economics, politics, and other. These categories were selected by the researchers based on literature about common types of news content. In hindsight, it was decided the private category does not correspond with types of news through the media. Since only around 4% of the news events were categorized as personal, these events were removed from the analyses.

Positive and negative affect

Positive affect (PA) and negative affect (NA) were measured by the Maastricht Momentary Mood Questionnaire (Van der Steen *et al.*, 2017). This questionnaire has been derived from the PANAS (Watson, Clark, & Tellegen, 1988) and has been validated for ESM research. The questionnaire consists of three positive (cheerful, relaxed, and content) and six negative emotions (insecure, lonely, anxious, irritated, down, and guilty). Respondents indicated to what extent they were currently experiencing these emotions on a 7-point Likert scale (1 = not at all; 7 = very). Depending on the research population, Van der Steen *et al.* (2017) report reliabilities for PA between .89 and .95, and for NA between .90 and .95 at the between-subject level. At the within-subject level, the reliabilities were respectively between .70 and .83 (PA), and between .65 and .76 (NA).

Cognitive appraisal

Cognitive appraisal was measured by five questions by Balzarotti and Cicero (2014), which were adapted from the Geneva Appraisal Questionnaire (Scherer, 2001). To alleviate the response burden, one question for each dimension was selected, which was then rephrased to fit the assessment of news perception. The questions concerned the main dimensions of threat appraisal, as postulated by Balzarotti and Cicero (2014): personal relevance ('The news event has important consequences concerning myself or to people living in my environment'); coping potential ('The news event and its consequences are controllable, and it is possible to cope with them'); suddenness ('The news event happened suddenly'); unpleasantness ('The news event was unpleasant'); and causation ('What caused the news event?') were assessed with 5-point Likert scales (1 = not at all, 5 = very or an equivalent). Only the data on personal relevance are reported in this paper.

Neuroticism

Neuroticism was measured once in the first questionnaire by 8 items obtained from the Eysenk Personality Questionnaire (EPQ; Sanderman *et al.*, 2012). An example item is as

follows: 'Is your mood often fluctuating' (1 = no, 2 = yes). The eight items were combined to a reliable neuroticism scale ($\omega = .77$).

Extraversion

Extraversion was also measured once in the first questionnaire by 8 items obtained from the Eysenk Personality Questionnaire (EPQ; Sanderman *et al.*, 2012). An example item is as follows: 'Are you a talkative person?' (1 = no, 2 = yes). The eight items were combined to a reliable extraversion scale ($\omega = .83$).

Analyses

The distribution of the data and various descriptive and explorative analyses were performed. In particular, possible differences for age and gender, having perceived news, and type of news were assessed. Multilevel analyses were performed on the hierarchical structured data to test the hypotheses. The assessments are at the first level and consist of participants' answers five times a day during ten consecutive days. Thus, a participant yields at maximum 50 assessments. The days and participants constitute the second and third levels in the analyses, respectively. The variables news valence, personal relevance, extraversion, and neuroticism were standardized using the overall mean and standard deviation.

We used R (R Core Team, 2016) and *lme4* (Bates, Maechler, Bolker, & Walker, 2015) to perform a linear mixed-effects analysis of the relationship between news perception and negative and positive affect, respectively. Three hierarchical multilevel models with increasing complexity were tested and compared by using the likelihood ratio test. Model 1 was the null model with only the intercept included as a fixed and random effect, model 2 consisted of the main effects (news valence, personal relevance, extraversion, neuroticism, and gender) as fixed factors, and in model 3, five interaction terms (news valence with respectively personal relevance, neuroticism, and extraversion; personal relevance with neuroticism; and the three-way interaction term: news valence \times personal relevance \times neuroticism) were added as fixed factors. News valence and personal relevance are both variables that vary within subjects, and are a level one interaction. The other interaction terms are cross-level interactions, because neuroticism and extraversion were measured at the subject level. *p*-values were obtained by applying the *lmerTest* package (Kuznetsova, Brockhoff, & Christensen, 2016).

Results

Descriptives and general analyses

The distribution of the data over 10 days is shown in Figure 1. The first day counts fewer assessments, because participants were not yet accustomed to the procedure. After the first day, a slowly decreasing trend is seen. On the last day, the number of assessments is at its lowest. Participants are most compliant at the start of the study. A similar decreasing pattern is recognized for the assessments within days. In fact, only 6% of the assessments are obtained the fifth and last time respondents were asked to fill in the questionnaire.

The type of news respondents were exposed to during the course of the study can be categorized as follows: private 4.3%, work-related 2.7%, war/terrorism 7.2%, disasters/accidents 5.1%, sports 4.9%, economics 4.9%, politics 12%, other 9%, and no news 54.8% of the time. An illustration of the type of news a random respondent reported being exposed to during the duration of the study is shown in Figure 2.

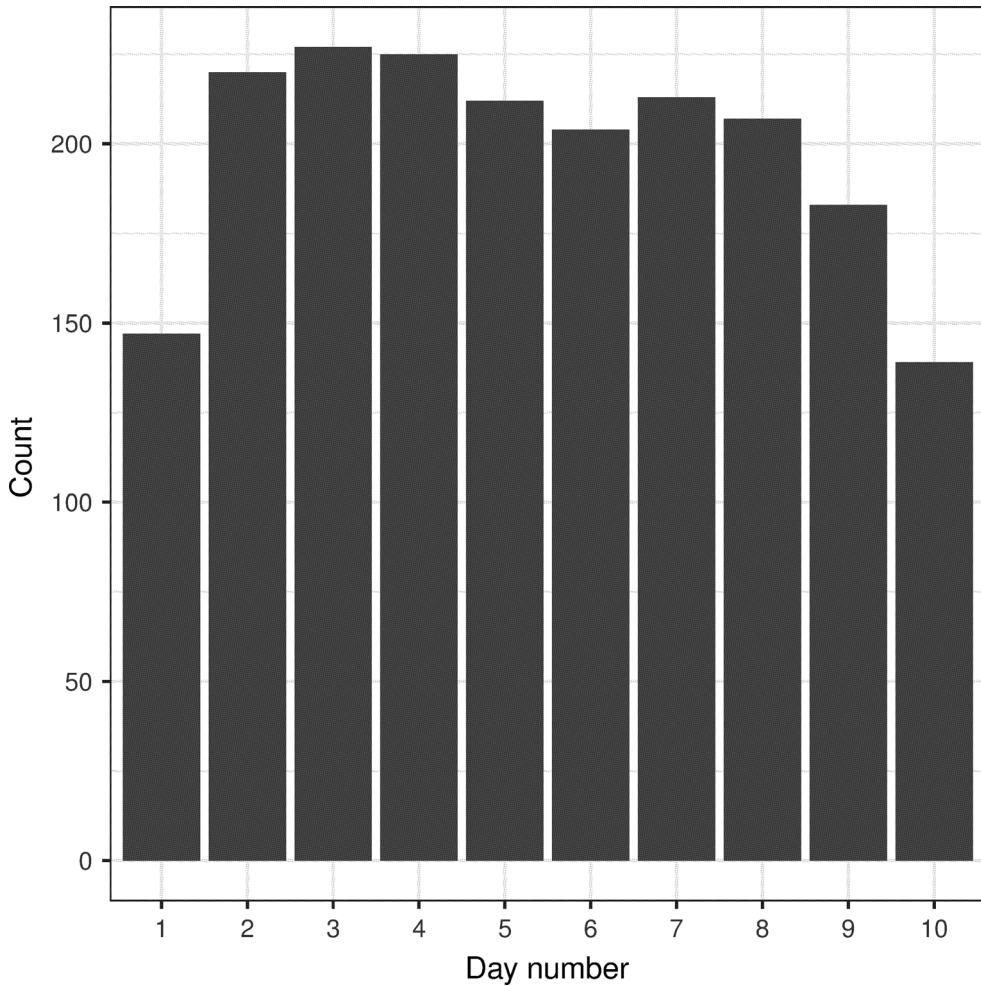


Figure 1. Number of assessments per day.

We tested for possible gender and age differences. First, we tested whether the overall level of negative affect was different for men ($M = 1.37, SD = 0.36$) and women ($M = 1.79, SD = 0.77$). Cohen's d for the difference was $-.54$ with 95% CI $[-1.05, -0.02]$. A t -test indicated that the difference in means was significant, $t(57.71) = -2.89, p = .005$. Women reported more negative affect than men. Also, men ($M = 5.32, SD = 1.12$) perceived the news as slightly more positive than women ($M = 4.65, SD = 0.71$). Cohen's d for the difference was $.95$ with 95% CI $[0.41, 1.48]$, which was significant, $t(34.48) = 2.63, p = .013$. Therefore, we controlled for gender in the main analyses. Positive affect ($r = .06, [-0.19, 0.30]$), negative affect ($r = .13, [-0.13, 0.36]$), and daily news perception ($r = -.12, [-0.36, 0.13]$) did not significantly correlate with age.

Next, we tested whether having perceived news or not was associated with negative affect at the moment. News was perceived in 50.2% ($n = 1,001$) of the cases. Negative affect was higher at moments when news was perceived ($M = 1.68, SD = 0.88$) compared to moments when news was not perceived ($M = 1.52, SD = 0.80$). Cohen's d for the difference was $-.18$ with 95% CI $[-0.27, -0.09]$ and $t(1977.6) = -4.27, p < .001$.

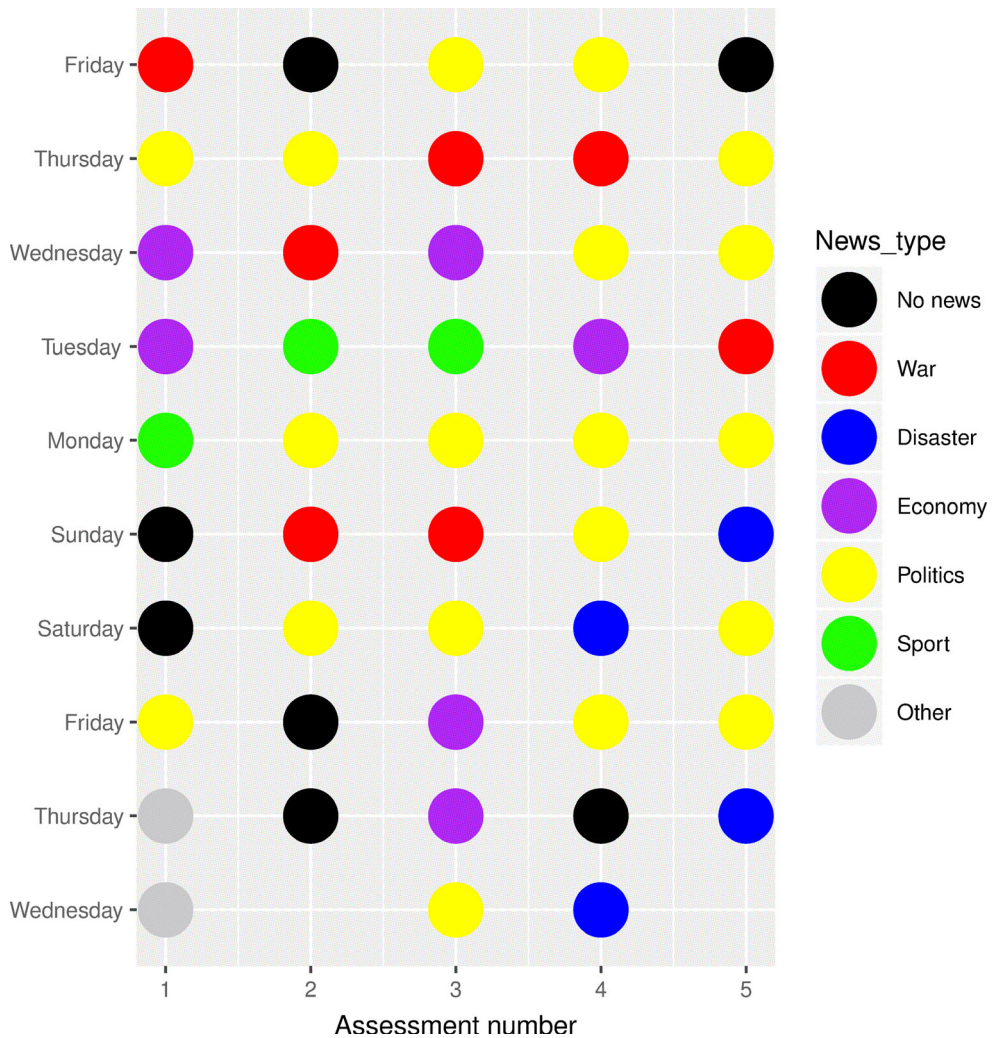


Figure 2. An example of the type of news reported during the duration of the study. [Colour figure can be viewed at wileyonlinelibrary.com]

Negative affect differed slightly across the various news types, $\eta^2 = .016$ [.003, .028], $F(4, 993) = 4.07$, $p = .003$ varying from sports/economics ($M = 1.54$, $SD = 0.83$, $n = 195$) to disasters/accidents ($M = 1.84$, $SD = 0.87$, $n = 102$). The effect of the type of news on the news valence was much stronger, $\eta^2 = .271$ [.231, .305], $F(4, 993) = 92.09$, $p < .001$. News in the category war/terrorism scored lowest (negative) on this scale ($M = 2.62$, $SD = 1.59$, $n = 144$), whereas sports/economics ($M = 6.11$, $SD = 2.25$, $n = 195$) yielded the highest (positive) score.

Testing the hypotheses

First, we checked the correlations between all main variables in the study (see Table 1). There were no significant correlations between news valence and any of the moderators. However, there was a small correlation between personal relevance and neuroticism, and

a medium correlation between neuroticism and extraversion. All predictor variables were significantly correlated with affect, except for personal relevance and positive affect. Finally, there was a strong correlation between negative and positive affect.

Next, three hierarchical multilevel models were applied to test whether negative affect was associated with daily news valence and whether personal relevance, extraversion, and neuroticism moderated this association. Because negative affect appeared to differ between men and women, gender was also included in each model. Visual inspection of residual plots did not reveal any obvious deviations from homoscedasticity or normality. The model comparison shows that each model improves upon the more parsimonious one. The interaction terms improve upon the main effects model, but this improvement is rather small.

The results for the fixed effects of model 3 are shown in Table 2. As can be seen, news valence is associated with negative affect, and more negative perceptions come with higher levels of negative affect. Also, news that is personally relevant results in more negative affect. The interaction effect (NP \times PR) suggests that these effects strengthen each other: The effect of news valence is stronger when it is considered as personally relevant. There is a rather strong association between neuroticism and negative affect. However, neuroticism does not seem to moderate the effect of news valence and also does not interact with the personal relevance of the news. No direct or indirect effects were found for extraversion.

Similar results with reversed signs for the parameter estimates were found when analysing positive affect. Only the final model is shown (see Table 3). Main effects were found for news valence and neuroticism, as well as an interaction effect between news valence and personal relevance. In addition, an interaction between news valence and extraversion was found.¹

Discussion

The present study adds to the growing amount of literature on the effects of media exposure on well-being and emotional states. The main aim of this study was to examine

Table 1. Correlations between all main variables in the study

	1.	2.	3.	4.	5.
1. News valence	–				
2. Personal relevance	.03	–			
3. Neuroticism	–.02	–.07*	–		
4. Extraversion	.02	.05	–.37**	–	
5. Negative affect	–.21**	.14**	.41**	–.25**	–
6. Positive affect	.21**	–.04	–.42**	.27**	–.66**

Note. * $p < .05$; ** $p < .01$.

¹ We performed additional analyses including coping as another cognitive appraisal facet in the model. Coping and news valence were positively correlated ($r = .19$, [0.13, 0.25]). Coping had no effect on negative affect ($b = -0.02$, $SE = .02$, $p = .453$), but a small effect on positive affect ($b = 0.07$, $SE = .03$, $p = .019$). More importantly, as expected, coping did not moderate the effect of news valence on both positive ($b = 0.03$, $SE = .02$, $p = .098$) and negative affects ($b = -0.03$, $SE = .02$, $p = .101$).

Table 2. Multilevel analysis of negative affect with a random effect for the intercept

Fixed effects	Estimate	SE	<i>p</i>
Intercept	-.39	.37	.294
News valence (NV)	-.16	.02	.000
Personal relevance (PR)	.06	.02	.004
Neuroticism	.35	.11	.002
Extraversion	-.08	.11	.469
Gender	.27	.22	.222
NV × PR	-.05	.02	.007
NV × neuroticism	.01	.03	.650
PR × neuroticism	-.00	.02	.889
NV × PR × neuroticism	-.02	.02	.483
NV × extraversion	-.04	.02	.076

Note. All variables are standardized.

Table 3. Multilevel analysis of positive affect with a random effect for the intercept

Fixed effects	Estimate	SE	<i>p</i>
Intercept	.42	.28	.144
News valence (NV)	.16	.02	.000
Personal relevance (PR)	-.02	.03	.405
Neuroticism	-.30	.09	.001
Extraversion	.10	.08	.238
Gender	-.27	.17	.121
NV × PR	.06	.02	.007
NV × neuroticism	.00	.03	.990
PR × neuroticism	.01	.03	.772
NV × PR × neuroticism	.04	.03	.132
NV × extraversion	.06	.03	.035

Note. All variables (except Gender) are standardized.

daily, everyday news exposure by testing whether negative affect and positive affect were influenced by daily news perceptions. In addition, we tested whether personal relevance of the news moderated the effect of the news perception and whether the personal difference variables, neuroticism and extraversion, were relevant in these associations. As expected, it was found that when daily news was perceived as more negative, people reported more negative affect and less positive affect. This corresponds with previous experimental studies (Balzarotti & Cicero, 2014; McIntyre & Gibson, 2016; Szabo & Hopkinson, 2007), as well as cross-sectional and longitudinal studies on severe news facts (Ahern *et al.*, 2004; Dougall *et al.*, 2005; Holman *et al.*, 2014). The results of the present study add to these findings by showing these same effects are found when looking at daily exposure to everyday news. Thus, news does not have to be very severe or shocking for people to be affected by it emotionally.

In addition, it was found that when personal relevance of the news was high, the reported negative affect also tended to be higher, stressing the importance of personal relevance in general and in appraisal of news especially (Balzarotti & Cicero, 2014; De

Hoog, 2013; Lazarus, 1991; Smith & Kirby, 2000). Moreover, as expected, personal relevance of the news moderated the association of news valence on reported negative affect and positive affect, respectively, with negative news having a stronger impact on affect when personal relevance was high. This is in line with studies on news perception showing personal relevance to be an important moderator (Balzarotti & Cicero, 2014; Marshall *et al.*, 2007).

These findings support cognitive appraisal theory (Ellsworth & Scherer, 2003; Lazarus, 1991; Lazarus & Folkman, 1984) as a relevant framework for explaining the effect of news perception on emotional states. As we postulated, when exposed to news facts, primary appraisal takes place, wherein someone assesses the severity and relevance of the news facts that in turn affect the emotional response. As the findings of the present study show, the more severe the news was perceived and the higher perceptions of personal relevance, the stronger the affective response. Although not the main focus of our study, additional analyses also showed support for our reasoning that when it comes to everyday news, secondary appraisal in the form of coping with the stressor plays a much smaller role, as most news stories are seen as outside of the person's control. Indeed, no direct or indirect effect of coping on affect was found, besides a small direct effect of coping on positive affect. Following the reasoning of cognitive appraisal theory, this implies that in order for people to be less affected by news exposure, the news either needs to be perceived as less severe or more under people's control. One way to achieve this could be for the media to stop stressing the negativity and severity of daily news and to provide more information about how people could cope with certain information, a concept recently described as constructive journalism (McIntyre & Gibson, 2016). Even though viewers might not have much control over the news, they do have control over how they cope with their emotional responses. Further studies should therefore look into the role of emotion-focused coping in news exposure.

Because not everyone is affected in the same way by news exposure (Valkenburg & Peter, 2013), and individual differences seem to play an important role in this (Gross & John, 2003; Kuppens & Tong, 2010; Scherer, 2001), we explored the importance of two personality characteristics, namely neuroticism and extraversion (Bolger & Schilling, 1991; Gallagher, 1990; Tong, 2010). Neuroticism had a relatively large effect on both affect measures. People with higher scores on neuroticism reported more negative and less positive affect. However, even though neuroticism had a large effect on affect in general, neuroticism did not moderate the effect of news exposure on affect, nor did it affect perceptions of personal relevance. In addition, extraversion only was a moderator for positive affect. Even though previous studies have established the role of both personality factors in affective responses (Rafienia *et al.*, 2008; Stafford *et al.*, 2010), neither seems to have a strong effect on people's news perception. Extraversion makes people exposed to negative news have more positive affect, but not less negative affect. This seems to imply that extraverts still have the same response of negative emotions to exposure to negative news as everyone else, but they just do not let it affect their positive emotions. Neuroticism just makes people experience more negative affect in general (Bolger & Schilling, 1991).

Limitations and recommendations

Even though the results of this study show important insight into the effect of daily, everyday news exposure on affective responses, some limitations need to be mentioned. First of all, a convenience sample was used in this study, limiting the generalizability of the

results. The sample had a representative distribution of gender and age, but mainly included people with a higher education. Thus, the sample was not very representative of the Dutch population. Future studies should attempt to use a more representative sample of people, especially to establish news effects in lower educated people. Secondly, even though we used an intensive longitudinal design (Conner *et al.*, 2009) that is known for being able to capture people's daily experiences effectively, as well as minimizes bias and has more ecological validity than experimental studies (Myin-Germeys *et al.*, 2009), it is also a very intensive research method asking a lot of the investment of participants. As a consequence, compliance with the study instructions in EMA studies is known to be less than in cross-sectional surveys. However, enough data points to detect moderate-to-large effects were still available to produce valid results when using ESM data (Delespaul, 1995). Thirdly, because we wanted to limit the burden of participants, we restricted the number of items to measure the relevant constructs. Even though some of these measures have been validated (Van der Steen *et al.*, 2017) or appear to be reliable measures, we cannot be certain that personal relevance, which was assessed with a single item, was measured reliably. In future studies, a more extensive and reliable measure of personal relevance needs to be used.

This study is the first, to our knowledge, that looks at the effect of everyday news exposure, using an intensive longitudinal design (Conner *et al.*, 2009). More research should be conducted using these – or similar – designs in order to truly capture the continuous nature of news exposure. These days, people do not just read or watch single news reports, but they are constantly exposed to news information, and the way we research this phenomenon should reflect the research designs we use. In addition, more research is needed into possible moderating or mediating factors. A clear picture that comes from this study, as well as previous studies, is that news exposure can negatively affect our moods; however, not enough is known about why some people are more affected by this than others.

So far, we know that factors that are important are personal relevance, but more individual difference measures need to be explored in order to get a better picture. Some interesting variables to consider include traits that could possibly affect how the news is perceived like locus of control (Bollini, Walker, Hamann, & Kestler, 2004) or optimism (Forgeard & Seligman, 2012), and specific variables related to cognitive appraisal and emotional responses such as coping style (Ben-Zur, 2009), affective self-regulatory efficacy (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003), or emotion regulation (Gross & John, 2003). Besides individual differences, social influences should be considered. How news is received and perceived has a lot to do with one's social surroundings, like indirect news exposure through social media (Kramer *et al.*, 2014). Surprisingly, relatively little research has been done on the role of social influence, like peer groups or social identity, in the effects of media exposure (Valkenburg, Peter, & Walther, 2016).

In conclusion, the present study showed the effect of daily news exposure on negative and positive affect and explored possible moderators. Negative news perception is related to more negative affect and less positive affect, and these effects are moderated by personal relevance. Thus, daily exposure to everyday news facts makes people feel bad, especially when they consider the news to be personally relevant. These results implicate we need to look more carefully at the way (negative) news is presented in the media, as well as the frequency of exposure to the news, in order to prevent people from being negatively affected by it.

References

- Ahern, J., Galea, S., Resnick, H., & Vlahov, D. (2004). Television images and probable posttraumatic stress disorder after September 11. *Journal of Nervous and Mental Disease, 192*, 217–226. <https://doi.org/10.1521/psyc.65.4.289.20240>
- Balzarotti, S., & Cicero, M. R. (2014). News reports of catastrophes and viewers' fear: Threat appraisal of positively and negatively framed events. *Media Psychology, 17*, 357–377. <https://doi.org/10.1080/15213269.2013.826588>
- Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., & Pastorelli, C. (2003). Role of affective self-regulatory efficacy in diverse spheres of psychosocial functioning. *Child Development, 74*, 769–782. <https://doi.org/10.1111/1467-8624.00567>
- Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*, 1–48. <https://doi.org/10.18637/jss.v067.i01>
- Ben-Zur, H. (2009). Coping styles and affect. *International Journal of Stress Management, 16*, 87–101. <https://doi.org/10.1037/a0015731>
- Biswas, R., Riffe, D., & Zillmann, D. (1994). Mood influence on the appeal of bad news. *Journal & Mass Communication Quarterly, 71*, 689–696. <https://doi.org/10.1177/1077699094071>
- Bolger, N., & Schilling, E. A. (1991). Personality and the problems of everyday life: The role of neuroticism in exposure and reactivity in daily stressors. *Journal of Personality, 59*, 355–386. <https://doi.org/10.1111/j.1467-6494.1991.tb00253.x>
- Bollini, A. M., Walker, E. F., Hamann, S., & Kestler, L. (2004). The influence of perceived control and locus of control on the cortisol and subjective response to stress. *Biological Psychology, 67*, 245–260. <https://doi.org/10.1016/j.biopsycho.2003.11.002>
- Brosius, H. B. (1993). The effects of emotional pictures in television news. *Communication Research, 20*, 105–124. <https://doi.org/10.1177/009365093020001005>
- Chen, S., Duckworth, K., & Chaiken, S. (1999). Motivated heuristic and systematic processing. *Psychological Inquiry, 10*, 44–49. https://doi.org/10.1207/s15327965pli1001_6
- Conner, T. S., Tennen, H., Fleeson, W., & Barrett, L. F. (2009). Experience sampling methods: A modern idiographic approach to personality research. *Social and Personality Psychology Compass, 3*, 292–313. <https://doi.org/10.1111/j.1751-9004.2009.00170.x>
- Davey, G. C., & Wells, A. (2006). *Worry and its psychological disorders: Theory, assessment and practice*. Chichester, UK: Wiley. Retrieved from <https://www.wiley.com>
- De Hoog, N. (2013). Processing of social identity threats: A defense motivation perspective. *Social Psychology, 44*, 361–372. <https://doi.org/10.1027/1864-9335/a000133>
- Delespaul, P. A. E. G. (1995). *Assessing Schizophrenia in Daily Life*. Maastricht, the Netherlands: Universitaire Pers Maastricht.
- Dougall, A. L., Hayward, M. C., & Baum, A. (2005). Media exposure to bioterrorism: Stress and the anthrax attacks. *Psychiatry, 68*, 28–42. <https://doi.org/10.1521/psyc.68.1.28.64188>
- Ellsworth, P. C., & Scherer, K. R. (2003). Appraisal processes in emotion. In R. J. Davidson, H. H. Goldsmith, & K. R. Scherer (Eds.), *Handbook of the affective sciences* (pp. 572–595). New York, NY: Oxford University Press. <https://doi.org/10.1017/s0033291703231871>
- Evans, J., & Frankish, K. (2012). *In two minds: Dual processes and beyond*. Oxford scholarship online. <https://doi.org/10.1093/acprof:oso/9780199230167.001.0001>
- Forgeard, M. J. C., & Seligman, M. E. P. (2012). Seeing the glass half full: A review of the causes and consequences of optimism. *Pratiques Psychologiques, 18*, 107–120. <https://doi.org/10.1016/j.prps.2012.02.002>
- Galician, M. L. (1986). Perceptions of good news and bad news on television. *Journalism Quarterly, 63*, 611–616. <https://doi.org/10.1177/107769908606300325>
- Gallagher, D. J. (1990). Extraversion, neuroticism and appraisal of stressful academic events. *Personality and Individual Differences, 11*, 1053–1057. [https://doi.org/10.1016/0191-8869\(90\)90133-C](https://doi.org/10.1016/0191-8869(90)90133-C)
- Gerend, M. A. &, & Sias, T. (2009). Message framing and color priming: How subtle threat cues affect persuasion. *Journal of Experimental and Social Psychology, 45*, 999–1002. <https://doi.org/10.1016/j.jesp.2009.04.002>

- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362. <https://doi.org/10.1037/0022-3514.85.2.348>
- Hansen, K. F. (2009). Approaching doomsday: How SARS was presented in the Norwegian media. *Journal of Risk Research, 12*, 345–360. <https://doi.org/10.1080/13669870802661455>
- Haskins, J. B., Miller, M. M., & Quarles, J. (1984). Reliability of the news direction scale for analysis of the good-bad news dimension. *Journalism Quarterly, 61*, 524–528. <https://doi.org/10.1177/107769908406100307>
- Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life. Experience sampling method measuring the quality of everyday life*. Thousand Oaks, CA: Sage. <https://doi.org/10.4135/9781412984201>
- Hollbert, R. L., Zeng, C., & Robinson, N. W. (2017). Adopting an integrated behavioral model approach to the study of news media exposure: A focus on experiential and instrumental attitudes towards politics. *Mass Communication and Society, 20*, 573–593. <https://doi.org/10.1080/15205436.2016.1274764>
- Holman, E. A., Garfin, D. R., & Silver, R. C. (2014). Media's role in broadcasting acute stress following the Boston Marathon bombings. *PNAS, 111*, 93–98. <https://doi.org/10.1073/pnas.1316265110>
- Johnston, W. M., & Davey, G. C. (1997). The psychological impact of negative TV news bulletins: The catastrophizing of personal worries. *British Journal of Psychology, 88*, 85–91. <https://doi.org/10.1111/j.2044-8295.1997.tb02622.x>
- Kaspar, K., Ramos Gameiro, R., & König, P. (2015). Feeling good, searching the bad: Positive priming increases attention and memory for negative stimuli on webpages. *Computers in Human Behavior, 53*, 332–343. <https://doi.org/10.1016/j.chb.2015.07.020>
- Kleemans, M., de Leeuw, R., Gerritsen, J., & Buijzen, M. (2017). Children's responses to negative news: The effects of constructive reporting in newspaper stories for children. *Journal of Communication, 67*, 781–802. <https://doi.org/10.1111/jcom.12324>
- Kramer, A. D., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences of the United States of America, 111*, 8788–8790. <https://doi.org/10.1073/pnas.1320040111>
- Kuppens, P., & Tong, E. M. W. (2010). An appraisal account of individual differences in emotional experience. *Social and Personality Psychology Compass, 4*, 1138–1150. <https://doi.org/10.1111/j.1751-9004.2010.0032.x>
- Kuznetsova, A., Brockhoff, P. B., & Christensen, R. (2016). *lmerTest: Tests in Linear Mixed Effects Models*. Retrieved from <https://cran.r-project.org/package=lmerTest>
- Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist, 46*, 819–834. <https://doi.org/10.1037/0003-066X.46.8.819>
- Lazarus, R., & Folkman, S. (1984). *Stress, appraisal and coping*. New York, NY: Springer. Retrieved from <http://www.springerpub.com>
- Lee, A. M., & Chyi, H. I. (2014). Motivational consumption model: Exploring the psychological structure of news use. *Journalism and Mass Communication Quarterly, 91*, 706–724. <https://doi.org/10.1177/1077699014550088>
- Maguen, S., Papa, A., & Litz, B. T. (2008). Coping with the threat of terrorism: A review. *Anxiety Stress and Coping, 21*, 15–35. <https://doi.org/10.1080/10615800701652777>
- Marin, M. F., Morin-Major, J. K., Schramek, T. E., Beaupre, A., Perna, A., Juster, R. P., & Lupien, S. J. (2012). There is no news like bad news: Women are more remembering and stress reactive after reading real negative news than men. *PLoS ONE, 7*, e47189. <https://doi.org/10.1371/journal.pone.0047189>
- Marshall, R. D., Bryant, R. A., Amsel, L., Suh, E. J., Cook, J. M., & Neria, Y. (2007). The psychology of ongoing threat: Relative risk appraisal, the September 11 attacks, and terrorism-related fears. *American Psychologist, 62*, 304–316. <https://doi.org/10.1037/0003-066X.62.4.304>

- McIntyre, K. E., & Gibson, R. (2016). Positive news makes readers feel good: A “silver-lining” approach to negative news can attract audiences. *Southern Communication Journal*, *81*, 304–315. <https://doi.org/10.1080/1041794X.2016.1171892>
- McNaughton-Cassill, M. E. (2001). The news media and psychological distress. *Anxiety Stress and Coping*, *14*, 193–211. <https://doi.org/10.1080/10615800108248354>
- Myin-Germeys, I., Oorschot, M., Collip, D., Lataster, J., Delespaul, P., & van Os, J. (2009). Experience sampling research in psychopathology: Opening the black box in daily life. *Psychological Medicine*, *39*, 1533–1547. <https://doi.org/10.1017/S0033291708004947>
- Oliver, J., & Brough, P. (2002). Cognitive appraisal, negative affectivity and psychological well-being. *New Zealand Journal of Psychology*, *31*, 2–7. Retrieved from <http://www.psychology.org.nz/>
- Palmier-Claus, J. E., Myin-Germeys, I., Barkus, E., Bentley, L., Udachina, A., Delespaul, P. A. E. G., . . . Dunn, G. (2011). Experience sampling research in individuals with mental illness: Reflections and guidance. *Acta Psychiatrica Scandinavica*, *123*, 12–20. <https://doi.org/10.1111/j.1600-0447.2010.01596.x>
- Penley, J. A., & Tomaka, J. (2002). Associations among the Big Five, emotional responses, and coping with acute stress. *Personality and Individual Differences*, *32*, 1215–1228. [https://doi.org/10.1016/s0191-8869\(01\)00087-3](https://doi.org/10.1016/s0191-8869(01)00087-3)
- Peters, G.-J. Y. (2014). The alpha and omega of scale reliability and validity: Why and how to abandon Cronbach’s alpha. *The European Health Psychologist*, *16*(2), 56–69.
- Pfefferbaum, B., Doughty, D. E., Reddy, C., Patel, N., Gurwitsch, R. H., Nixon, S. J., & Tivis, R. D. (2002). Exposure and peritraumatic response as predictors of posttraumatic stress in children following the 1995 Oklahoma City bombing. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, *79*, 354–363. <https://doi.org/10.1093/jurban/79.3.354>
- Philo, G. (2002). Television news and audience understanding of war, conflict and disaster. *Journalism Studies*, *3*, 173–186. <https://doi.org/10.1080/14616700220129955>
- Piotrkowski, C. S., & Brannen, S. J. (2002). Exposure, threat appraisal, and lost confidence as predictors of PTSD symptoms following September 11, 2001. *American Journal of Orthopsychiatry*, *72*, 476–485. <https://doi.org/10.1037/0002-9432.72.4.476>
- Potts, R., & Sanchez, D. (1994). Television viewing and depression: No news is good news. *Journal of Broadcasting and Electronic Media*, *38*, 79–90. <https://doi.org/10.1080/08838159409364247>
- R Core Team (2016). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- Rafienia, P., Azadfallah, P., Fathi-Ashtiani, A., & Rasoulzadeh-Tabatabaie, K. (2008). The role of extraversion, neuroticism and positive and negative mood in emotional information processing. *Personality and Individual Differences*, *44*, 392–402. <https://doi.org/10.1016/j.paid.2007.08.018>
- Sanderman, R., Arrindell, W. A., Ranchor, A. V., Eysenck, H. J., & Eysenck, S. B. G. (2012). *Het meten van persoonlijkheidskenmerken met de Eysenck Personality Questionnaire (EPQ): Een handleiding*. [Measuring of personality characteristics with the Eysenck Personality Questionnaire (EPQ): A manual.] UMCG/Rijksuniversiteit Groningen: Research Institute SHARE. Retrieved from <https://www.umcg.nl>
- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, *4*, 219–247. <https://doi.org/10.1037//0278-6133.4.3.219>
- Scherer, K. R. (2001). Appraisal considered as a process of multilevel sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 92–120). New York, NY: Oxford University Press. Retrieved from <https://global.oup.com>
- Smith, C. A., & Kirby, L. (2000). Consequences require antecedents: Toward a process model of emotion elicitation. In J. P. Forgas (Ed.), *Feeling and thinking: The role of affect in social*

- cognition* (pp. 83–106). New York, NY: Cambridge University Press. Retrieved from <http://www.cambridge.org>
- Stafford, L. D., Ng, W., Moore, R. A., & Bard, K. A. (2010). Bolder, happier, smarter: The role of extraversion in positive mood and cognition. *Personality and Individual Differences, 48*, 827–832. <https://doi.org/10.1016/j.paid.2010.02.005>
- Sun, Y., Krakow, M., John, K. K., Liu, M., & Weaver, J. (2016). Framing obesity: How news frames shapes attributions and behavioral responses. *Journal of Health Communication, 21*, 139–147. <https://doi.org/10.1080/108010730.2015.1039676>
- Szabo, A., & Hopkinson, K. L. (2007). Negative psychological effects of watching the news in the television: Relaxation or another intervention may be needed to buffer them! *International Journal of Behavioral Medicine, 14*, 57–62. <https://doi.org/10.1007/BF03004169>
- Tong, E. M. W. (2010). Personality influences in appraisal-emotion relationships: The role of neuroticism. *Journal of Personality, 78*, 398–417. <https://doi.org/10.1111/j.1467-6494.2010.00620.x>
- Unz, D. C., Schwab, F., & Winterhoff-Spurk, P. (2008). TV news—the daily horror? Emotional effects of violent TV news. *Journal of Media Psychology, 20*, 141–155. <https://doi.org/10.1027/1864-1105.20.4.141>
- Valkenburg, P. M., & Peter, J. (2013). Five challenges for the future of media-effects research. *International Journal of Communication, 7*, 197–215. <https://doi.org/1932-8036/2013FEA0002>
- Valkenburg, P. M., Peter, J., & Walther, J. B. (2016). Media effects: Theory and research. *Annual Review of Psychology, 67*, 315–338. <https://doi.org/10.1146/annurev-psych-122414-033608>
- Van der Steen, Y., Gimpel-Drees, J., Lataster, T., Viechtbauer, W., Simons, C. J. P., Lardinois, M., . . . Myin-Germeys, I. (2017). Clinical high risk for psychosis: The association between momentary stress, affective and psychotic symptoms. *Acta Psychiatrica Scandinavica, 136*, 63–73. <https://doi.org/10.1111/acps.12714>
- Van t Riet, J., Ruiter, R., & De Vries, H. (2012). Preaching to the choir? The influence of personal relevance on the effect of gain- and loss-framed health promoting messages. *Journal of Health Psychology, 17*, 712–723. <https://doi.org/10.1177/1359105311421047>
- Veitch, R., & Griffitt, W. (1976). Good news-bad news: Affective and interpersonal effects. *Journal of Applied Social Psychology, 6*, 69–75. <https://doi.org/10.1111/j.1559-1816.1976.tb01313.x>
- Wang, T. (2012). Presentation and impact of market-driven journalism on sensationalism in global TV news. *International Communication Gazette, 74*, 711–727. <https://doi.org/10.1177/1748048512459143>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The panas scales. *Journal of Personality and Social Psychology, 54*, 1063–1070. <https://doi.org/10.1037//0022-3514.54.6.1063>
- Zillmann, D., Chen, L., Knobloch, S., & Callison, C. (2004). Effects of lead framing on selective exposure to internet news reports. *Communication Research, 31*, 58–81. <https://doi.org/10.1177/0093650203260201>