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The Effects of Weather on Daily Mood: A Multilevel Approach

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The present study examines the effects of six weather parameters (temperature, wind power, sunlight, precipitation, air pressure, and photoperiod) on mood (positive affect, negative affect, and tiredness). Data were gathered from an online diary study ($N = 1{,}233$), linked to weather station data, and analyzed by means of multilevel analysis. Multivariate and univariate analyses enabled distinction between unique and shared effects. The results revealed main effects of temperature, wind power, and sunlight on negative affect. Sunlight had a main effect on tiredness and mediated the effects of precipitation and air pressure on tiredness. In terms of explained variance, however, the average effect of weather on mood was only small, though significant random variation was found across individuals, especially regarding the effect of photoperiod. However, these individual differences in weather sensitivity could not be explained by the Five Factor Model personality traits, gender, or age.

Keywords: weather, mood, multilevel modelling, personality

Weather is widely believed to influence people's mood. For example, the majority of people think they feel happier on days with a lot of sunshine as compared to dark and rainy days. Although this association seems to be common sense (Watson, 2000), it is striking to see that the number of studies on the association between daily weather and mood is relatively small (Keller et al., 2005). In studying such an association, seasonal influences of weather must be distinguished from day-to-day influences. This distinction becomes clearest when studying the effect of the amount of sunlight (i.e., hours per day were a shadow can be detected) on mood: This variable both fluctuates between days within a single season (e.g., a sunny vs. a cloudy summer day), but also between seasons (in the northern hemisphere, photoperiods are longest during summer and shortest during winter, leading to more hours/day for potential unobstructed sunlight accumulation in summer than in winter). This distinction is important since mood reactions to day-to-day weather fluctuations may not generalize to reactions to seasonal weather fluctuations, and vice versa. In studying the effects of weather on mood, several studies have focused exclusively on individuals with seasonal affective disorder (SAD), a condition that involves recurrent fall/winter major depressive episodes that remit in the spring (e.g., Molin, Mellerup, Bolwig, Scheike, & Dam, 1996; Oren et al., 1994; Young, Meaden, Fogg, Cherin, & Eastman, 1997). Such a clinical condition may be an extreme manifestation of normal variations in seasonality (defined as an individual's degree of seasonal variation in mood, energy level, sleep length, weight, appetite, and social activities; Kasper, Wehr, Bartko, Garst, & Rosenthal, 1989).

Previous studies on weather and its relation with psychological constructs took only one or two weather parameters into account (e.g., Bushman, Wang, & Anderson, 2005; Keller et al., 2005). However, it is important to examine a wide variety of weather parameters, to be able to differentiate the effect of each parameter. For example, temperature is often associated with sunlight. After controlling for the parameter sunlight, the unique effect of temperature on mood might decrease or even reverse in sign. The present study includes a broad range of weather parameters simultaneously to study the effects of daily weather changes. Specifically, we studied the effect of temperature, wind power, sunlight, precipitation, air pressure, and photoperiod on mood. Multivariate and univariate analyses enable a distinction between unique and shared effects of these parameters.

Mood has often been conceptualized within a circumplex structure of affect (Feldman Barrett, 1995). In this structure, the dimensions of valence (unpleasantness vs. pleasantness) and arousal (low vs. high) can be distinguished. In studying people's mood, the PANAS mood scale (Watson, Clark & Tellegen, 1988) is frequently used, which provides a clear and reliable measurement of positive and negative affect. However, the PANAS general dimension scales combine the dimension of valence with a high arousal focus. To consider the low end of the arousal dimension, this study also focused on tiredness as a dependent variable.

The effect of daily weather on people's mood has been most thoroughly investigated in two studies. First, Keller et al. (2005) investigated the effect of temperature and barometric pressure on single-occasion explicit and implicit mood valence (positive mood

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subtracted by negative mood) and cognition (memory and cognitive style) in three different samples of (mostly) North American participants. They found no consistent main effects of weather on mood, though they found a moderator effect of both season and the time participants' spent in the open air: On spring days when people spent a lot of time outside, mood was positively associated with air temperature. On summer days, however, spending more time outside on warm days was associated with decreased mood In addition, on spring days, barometric pressure was positively associated with mood (no main or interaction effects were reported for the other seasons).

Watson (2000) collected diary reports by eight different samples of students from Texas (total $N = 478$) between 1985 and 1993, during either fall or spring. Participants reported their mood on an average of 43.6 occasions), using the 11 subscales of the PANAS-X (Watson & Clark, 1994). Watson (2000) focused his analyses on the amount of sunshine and rain, but found no consistent effects on any of the daily mood variables. To investigate whether mood would be associated with weather on days with extreme weather conditions, Watson (2000) also compared days with 0% sunshine with days with 100% sunshine but found that sunshine only influenced the overall intensity of participants' mood reports, not the valence of these reports (i.e., participants reported more extreme scores on both positive *and* negative mood scales).

To summarize, both the Keller et al. (2005) and the Watson (2000) study found no consistent main effects of weather on mood. However, the conclusions of both studies are limited by a number of factors. First, they almost exclusively focused on participants from North America, so it is unclear whether effects can be generalized to other regions. Second, the study by Keller et al. (2005; though not the one by Watson, 2000) investigated only the effects of two weather parameters and one mood valence variable. To extend these findings, the present study used a broader approach in studying the relation between weather and mood by including a wider variety of weather parameters and including three aspects of mood. Going beyond both the Keller et al. (2005) and the Watson (2000) study, the current investigation also studies the effect of wind power and photoperiod on mood. Third, the present study also extends previous research by examining individual differences in sensitivity to weather fluctuations. It is expected that the effects of weather on mood differ across individuals. Although individual differences in sensitivity to daily weather have not been studied previously, the results of some studies suggest a link between seasonality and personality, especially concerning the trait of neuroticism (e.g., Jang, Lam, Livesley, & Vernon, 1997; Murray, Hay, & Armstrong, 1995). Therefore, it is interesting to examine whether also a link between sensitivity to daily weather and personality exists.

Personality and demographic characteristics will be examined to see if individual differences in sensitivity to weather changes can be predicted (Ennis & McConville, 2004). To adopt an exploratory approach of personality as a moderator between daily weather and mood in the current study, personality will be assessed at the broad level of the Five Factor Model. In addition, gender and age will be included in the analysis. Some studies (e.g., Rosen et al., 1990) have found a decrease in seasonality and SAD with increasing age, though it may also require some degree of exposure to develop a sensitivity to the local climate and photoperiod. In addition, seasonal affective disorder is found to have a higher prevalence rate in women than in men (e.g., Lucht & Kasper, 1999; Rosen et al., 1990). Finally, the present study investigated the moderating role of season to replicate the finding by Keller et al. (2005) that temperature only affects mood during the spring.

Since the present study examines within-person associations between daily psychological states and daily weather variables, data have to be collected across a series of days (diary method). Diary methods reduce retrospective bias because of minimizing the time between experiences and the report of these experiences (Bolger, Davis, & Rafaeli, 2003). In this study, the Internet was used to conduct a diary study. The use of the Internet might result in large sample sizes and eases data collection for a longer period of time (Michalak, 1998). Data was gathered for an uninterrupted sequence of months that include different seasons of the year.

To summarize, this study investigates the effects of daily weather on people's mood, while taking individual differences into account. The effects of six different weather variables on three separate mood variables are examined. Furthermore, to examine what might account for individual differences, the Big Five personality traits, gender, and age are included in the study. In addition, we investigated the possible moderating role of season. The aim of this exploratory approach is to get a further understanding of the possible relation between weather, personality, and mood.

Method

Participants and Design

Initially, 1,668 individuals signed up for the current study. Only the 1,233 respondents (73.9%) who provided a German postal zip code and an email address that indicated residence in Germany were included in the study, so that we were able to match respondents with the available weather information. Participants had a mean age of 27.67 ($SD = 9.77$), with a range from 13 to 68 years. A majority of 88.6% (1092) of the respondents were women. Participants most often started their participation in autumn ($N = 449$), followed by summer ($N = 336$), spring ($N = 233$), and winter ($N = 215$).

Instruments and Procedure

Pretest. Data was gathered by means of an online diary, which focused on the determinants of individual daily well-being. The data was collected between July 2005 and February 2007. Publicity for this study was generated through links on websites dedicated to psychological research as well as postings on online forums. Before taking part in the diary study, participants completed an extensive online pretest questionnaire (including some measures irrelevant to the current study). The Five Factor Model personality traits were assessed using the Big Five Inventory (BFI; John & Srivastava, 1999). This scale contained 42 items measuring Extraversion (eight items), Neuroticism (seven items), Openness to Experiences (10 items), Conscientiousness (nine items), and Agreeableness (eight items). Reliability analysis revealed a Cronbach's alpha of .90 for Extraversion, .85 for Neuroticism, .83 for Openness, .84 for Conscientiousness, and .74 for Agreeableness.

Internet-based diary study. Upon completing the pretest questionnaire, participants filled out daily questionnaires including measures of positive affect, negative affect, and tiredness. Daily positive and negative affect were assessed by means of the PANAS mood scale (Watson & Clark, 1994). Positive affect was measured with the items "active," "alert," "attentive," "determined," "enthusiastic," "excited," "inspired," "interested," "proud," and "strong," whereas the scale of negative affect contained the items "afraid," "scared," "nervous," "jittery," "irritable," "hostile," "guilty," "ashamed," "upset," and "distressed." The items "sleepy," "tired," "sluggish," and "drowsy" from the PANAS-fatigue scale (Watson & Clark, 1994) loaded on the same factor as the items "quiet" and "still" that tap into the arousal dimension of the mood circumplex (Feldman Barrett, 1995), so they were combined into a single scale of daily tiredness. Items were presented with scales from 1 ("not at all") to 5 ("very much"). The mean score on positive affect in the sample was 2.85 (SD = 0.79), negative affect had a mean of 1.83 (SD = 0.75), and the mean score on tiredness was 2.23 (SD = 0.88).

The different scales of the daily questionnaires were presented in randomized order to avoid the development of automatic response sets. The questionnaire was only accessible between 9 p.m. and 4 a.m. Participants were asked to complete 25 daily questionnaires within 30 days. However, not all participants completed the full 25 questionnaires needed for feedback. On average, participants contributed 13.75 daily reports (SD = 10.30). As an incentive, participants received feedback regarding the extent to which a number of factors affected their mood during the course of the study (e.g., amount of sleep, number of social interactions) after the last daily report.

Objective weather data. Data from the German Weather Institute (Deutscher Wetterdienst; http://www.dwd.de) was used to obtain weather data from all German weather stations. The daily weather variables were matched to the diary data of the respondents by date and ZIP code. The data from the weather stations contained variables that were highly correlated, such as minimum temperature, maximum temperature, and mean temperature. Therefore, a factor analysis with oblique (oblimin) rotation was conducted. This resulted in three factors, which were labeled 'temperature,' 'sunlight,' and 'wind power.' The variables mean temperature in degrees Celsius, hours of unobstructed sunlight (i.e., the number of hours in which a shadow can be detected), and mean wind power on the Beaufort scale (Bft) were used to represent these factors in the analysis. The variables precipitation in millimeters and mean air pressure measured in hectopascal (hPa) did not load on one of the three defined factors and were therefore considered as separate variables. The daily mean temperature ranged from −17.80 to 28.40 °C (−0.04 to 83.12 °F), with a mean of 11.28 (SD = 6.62) degrees Celsius (M = 52.30, SD = 43.92 °F). The mean wind power ranged from 0 to 7 Bft (M = 2.56, SD = 0.80), sunlight ranged from 0 to 16.50 hours (M = 4.76, SD = 4.15), precipitation had a range from 0 to 47.10 mm (M = 1.93, SD = 3.84), and air pressure had a range from 895.90 to 1042.30 hPa (M = 990.86, SD = 22.26).

In addition, photoperiod was calculated by subtracting the time of sunrise from the time of sunset for the various days that were studied (using the geographical center of Germany as the reference point on http://www.sonnenaufgang-sonnenuntergang.de/). The resulting variable had a range from 7.87 to 16.60 (M = 12.33, SD = 2.66). Although this variable is obviously confounded with hours of sunlight (see below), photoperiod is completely determined by calendar date and latitude (e.g., shortest and longest day length at the winter and summer solstice, respectively, in the northern hemisphere), whereas the amount of unobstructed sunlight also taps into day-to-day fluctuations (e.g., a clouded vs. a sunny summer day).

Data Analysis

Because data from diary studies are nested data (repeated measures within an individual) and missings often occurred because not all respondents participated in the study for the full length of 25 days, multilevel analysis (linear mixed-model using SPSS) was the method of choice to analyze this dataset. Because of the large sample size, only effects that are significant at the $p < .01$ level will be reported.

First, a multivariate linear mixed-model analysis with fixed effects of the six weather parameters (Level 1) was conducted to identify main effects of weather data on mood, while controlling for the other weather parameters. Second, to test whether the effects of weather on mood differed across individuals, univariate linear mixed-model analyses were conducted including random effects (slopes). Finally, personality and demographic characteristics (age, gender; Level 2), as well as season (Level 1) were added in the linear mixed-models for each weather parameter separately to explain the expected variance in random effects.

Results

Associations Between Weather Variables

To inspect the degree of interdependence between the six weather variables, these parameters were correlated across the 585 days that were studied. The correlations between the six weather variables ranged between |.12| and |.76| and were all statistically significant, with large correlations (>|.5|) between temperature and photoperiod, sunlight and photoperiod, and temperature and sunlight (see Table 1). The strength of these associations illustrates the need to distinguish between univariate (i.e., potentially confounded) and multivariate (i.e., unique) effects of weather parameters on mood.

Main Effects of Weather Parameters

Positive affect. Multivariate and univariate linear mixed-model analyses revealed no significant ($p < .01$) main effects of temperature, wind power, sunlight, precipitation, air pressure, and photoperiod on positive affect (see Table 2 for standardized regression coefficients). In addition, it was checked whether temperature had a curvilinear effect on mood. However, including a quadratic term of temperature did not result in better model fit of the data for any of the three dependent variables. Thus, in further analyses of the data, the effect of temperature was treated to be linear.

The random-effects analysis indicated that the variance between individuals in the effects of weather on positive affect was significant ($p < .01$) for all variables except precipitation ($p = .013$). The largest random effect was found for photoperiod. Overall, these findings suggest that the direction and the strength of the association between weather and positive affect differed between individuals.

Table 1
Pearson Correlations Between Weather and Mood Variables Across 585 Days

	Temperature	Wind power	Sunlight	Rain	Air pressure
Wind power	−.171*				
Sunlight	.580*	−.413*			
Precipitation	.119*	.341*	−.337*		
Air pressure	.107*	−.321*	.311*	−.376*	
Photoperiod	.762*	−.275*	.597*	.115*	.154*

* $p < .01$.

Negative affect. A significantly ($p > .01$) positive main effect of temperature ($\beta = 0.035$) and negative main effects of wind power ($\beta = -0.023$) and sunlight ($\beta = -0.023$) on negative affect were found to be significant in the multivariate linear mixed-model analysis with fixed effects. Interestingly, these main effects were not found in the univariate linear mixed-model analyses, indicating that the positive effect of temperature initially suppressed the negative effect of sunlight.

The variance between individuals in the effects of weather on negative affect was found to be significant ($p < .01$) for all variables except for precipitation. Thus, the effects of all weather parameters on negative affect differed between individuals. Interestingly, the random variance around the slope of the (nonsignificant) photoperiod effect ($\sigma^2 = .166$) was more than three times higher than the random variance around the other slopes ($\sigma^2 < .050$).

Tiredness. In the multivariate mixed-model analysis with fixed effects, a significantly ($p < .01$) negative main effect of sunlight on tiredness was found ($\beta = -0.063$). The results of the univariate mixed-model analyses with random effects also yield a significant main effect of sunlight ($\beta = -0.065$). In addition, univariate mixed-model analyses showed main effects of precipitation ($\beta = 0.032$) and air pressure ($\beta = -0.071$).

The absence of these main effects in the multivariate analysis suggests that the effects of precipitation and air pressure were partly dependent on the effect of sunlight. To test whether the effects of precipitation and air pressure were mediated by the variable sunlight, a mediation analysis was conducted (Baron & Kenny, 1986). First, the unique effects of precipitation and air pressure on tiredness were found to be significant, but disappeared when controlling for sunlight (see Table 2). Second, the association between sunlight and tiredness was significant (see Table 2), with more sunlight being associated with less tiredness. Finally, the negative association between precipitation and sunlight and the positive association between air pressure and sunlight was significant (see Table 1). Therefore, it can be concluded that sunlight significantly mediated the effects of precipitation and air pressure on tiredness.

The random-effects analyses revealed significant ($p < .01$) random slope variance between individuals in the effects of all weather variables on tiredness, except for wind power. These findings suggest that the effects of weather on tiredness differ between individuals. Notably, the between-person variance around the slope of photoperiod was again much higher than the variance around the slope of the other weather variables.

Including Variables on the Person Level in the Models

The random-effects analysis on Level 1 (weather variables) revealed that the effects of weather variables on people's mood differed between individuals. To examine whether person characteristics such as personality traits, age, and gender could account for these individual differences, these variables were included as predictors of the slope between each weather parameter and mood outcome combination. In addition, the effect of weather on mood was allowed to vary according to season (with separate dummies for spring, summer, and autumn). After Bonferroni correction to decrease the possibility of capitalization by chance ($z > 3.58$, $p < .0003$ when applying an alpha level of .05), the interaction effects of the weather parameters and the Big Five, age, and gender were not found to be significant. These variables were thus unable to

Table 2
Regression Coefficients of the Main Effects of Weather Parameters on Positive Affect, Negative Affect, and Tiredness

	Positive affect			Negative affect			Tiredness		
	Multivar.	Univar.		Multivar.	Univar.		Multivar.	Univar.	
	β	β	σ²	β	β	σ²	β	β	σ²
Temperature	.016	.015	.063**	.035*	.026	.044**	.019	.007	.050**
Wind power	−.006	−.012	.009**	−.023*	−.016	.008**	−.001	.017	.004
Sunlight	.012	.017	.012**	−.023*	−.013	.009**	−.063**	−.065**	.009**
Precipitation	−.002	−.011	.004	−.001	.001	.002	.011	.032**	.004*
Air pressure	.023	.031	.047**	−.010	−.018	.048**	−.032	−.071**	.031*
Photoperiod	−.011	.006	.105**	.000	.019	.166**	.042	.043	.206**

Note. β = regression weight based on standardized variables; σ^2 = random variance; Multivariate analyses are with fixed effects, univariate analyses are with random effects. * $p < .01$. ** $p < .001$.

explain the individual differences in the effect of weather on mood. In addition, three-way interaction effects of weather, personality traits, and gender were examined, but no significant effect was found. However, we did find a significantly negative interaction effect between season and wind power in explaining fluctuations in positive affect, indicating that the experience of a windy day had a more negative effect on mood in summers and springs than during winters and autumns.

Discussion

The aim of the study was to investigate the effect of daily weather changes on people's mood. It was expected that individual differences in sensitivity to weather changes exist. The results of the current study showed no significant main effects of daily weather on positive affect. This result is consistent with findings by Keller et al. (2005) and Watson (2000), who also did not find effects of weather on overall mood valence. Going against commonly held conceptions (Watson, 2000), it is interesting to note that none of the six weather parameters had any significant main effects on positive mood. Accordingly, the idea that pleasant weather increases people's positive mood in general is not supported by the findings of this study, although the finding of significant between-person variance suggests that such a link may still exist for some individuals (while simultaneously a reverse effect holds for others).

Significant main effects of temperature, wind power, and sunlight on negative affect were found. The difference between the multivariate and univariate results showed that it was very informative to include different weather variables to identify the unique effect of each variable. The multivariate analysis showed unique effects of temperature, wind power, and sunlight, whereas the effects of temperature and sunlight were not visible in the univariate analyses because of confounds. Because univariate analyses do not control for other variables, positive and negative effects might cancel each other out.

Sunlight was found to have a significant main effect on tiredness and mediated the effect of precipitation and air pressure on tiredness. Vitamin D_3, which is produced in skin exposed to the hormone of sunlight, has been found to change serotonin levels in the brain, which could account for changes in mood (Lansdowne & Provost, 1998). Therefore, lower levels of vitamin D_3 could be responsible for increases in negative affect and tiredness.

As indicated by the relatively small regression weights ($<|.071|$), weather fluctuations accounted for very little variance in people's day-to-day mood. This result may be unexpected given the existence of commonly held conceptions that weather exerts a strong influence on mood (Watson, 2000), though it replicates findings by Watson (2000) and Keller et al. (2005), who also failed to report main effects. A number of factors may explain the discrepancy between empirical results and widely held beliefs (see also Watson, 2000). For example, it may be that these beliefs are a reflection of our historical (and possibly culturally transmitted) past, when people were much more dependent on weather-related phenomena (e.g., for shelter and food). It may also be that the discrepancy is because of a small number of extreme cases (e.g., individuals with SAD) who indeed report a strong association between weather and mood. Such cases may leave a very vivid impression on others, but the existence of significant between-person variance against the background of a null effect in the general population suggests that these extreme cases are offset by individuals with strikingly different weather dependencies (e.g., people who become sadder during summers instead of winters).

The random effects analyses indicated that the effects of weather on positive affect, negative affect, and tiredness varied significantly across individuals. This was especially true for the effect of photoperiod. Even though the within-subject range of this variable (M = 0.83, SD = 0.73) was vastly reduced when compared to the range of the amount of hours with unobstructed sunlight (M = 7.56, SD = 4.64), the random slope variance between persons was between 9 (positive affect) and 23 (tiredness) times greater in the former when compared to the latter. On average, the random effect for photoperiod was no less than 21 times greater than the average random effect of the other five weather variables, indicating that individual differences in reactions to changes in photoperiod are much more extreme than reactions to day-to-day weather fluctuations. This means that whereas some individuals may react to the shortening of daylight time with a relatively strong darkening of their mood, the emotions of other individuals may actually improve equally strongly as a result of this seasonal change. The former individuals may be the ones who fall prey to SAD during the dark season, though more research is needed to substantiate this conclusion.

Inclusion of the Five Factor Model personality traits, gender and age, did not reveal more moderation effects of the person-level variables than expected by chance. In other words, people seem to differ in the effects of weather on mood in a way that cannot be explained by the Five Factor Model personality traits, age, or gender. This might suggest that weather sensitivity is an individual difference variable by itself. Research on diurnal types (e.g., Jackson & Gerard, 1996) and seasonality (Reid, Towell, & Golding, 2000) also found individual differences that were independent to other personality traits. The findings of the present study suggest that people can also differ in weather sensitivity, independent from other personality traits.

The current study also investigated the moderating effect of season on the association between weather and mood in an attempt to replicate the finding by Keller et al. (2005) that weather fluctuations have an especially strong effect in spring. Consistent with this, we found that wind power had a more negative effect on positive mood during spring and summer. This might be because of the fact that people spend more of their leisure time outside during these periods, so experiencing strong winds represents more of a hassle, though this conclusion is highly speculative and needs to be backed up by future research.

Strengths. Usually, causal effects can only be identified in experimental designs. However, weather is an external variable that cannot be influenced by individuals' mood or any other third variable. Although our naturalistic design did not allow us to establish causality in the strict (experimental) sense, we believe that are findings are highly consistent with a causal model that flows from weather to mood (although we acknowledge that our results remain silent regarding the processes that mediate associations between weather and mood, such as physiological processes or daily activities). Furthermore, the data collection for the current study ran over an 18-month period, spanning all seasons, which provided a robust examination of the association between weather and mood and the moderating effect of season. Finally, the Web-based data collection ensured access to a large population, which resulted in a large and heterogeneous sample from all across Germany.

Limitations. Response to the questionnaire was based on voluntary participation of the study, which likely resulted in selection bias (e.g., unequal gender distribution). Furthermore, the relation between daily weather and mood were found in a moderate maritime/continental climate and might not generalize to other climate types. In addition, we failed to assess the time that participants spent outside, which may have emerged as an important moderator of the effect of weather on mood (Keller et al., 2005). A final limitation is that we relied on self-reported mood that may be biased by implicit theories regarding the association between weather and mood. This might especially be the case given that the framing of the study (focusing on the determinants of well-being) may have primed some subjects to reflect about the types of external factors affecting their mood. Nevertheless, we think this concern is somewhat assuaged by a number of factors. For one thing, our study was not advertised as being about the link between weather and mood, mostly assessed unrelated variables (e.g., social interaction quantity and quality), and included a personalized feedback that should have encouraged accurate responding. Most importantly, however, our results, if anything, go against popular stereotypes about the link between weather and mood. For example, we did not find any weather effects on positive mood, whereas most people assume that sunlight induces positive emotions (Watson, 2000). Against this background, some of the null results of the current study are all the more remarkable.

Conclusion

The present study contributes to the understanding of the relation between daily weather and people's mood. It extends the work by Keller et al. (2005) and Watson (2000) with two novel features. First, six different weather variables were included, which enabled a broad examination of the influence of daily weather. Second, a multilevel approach was used and this approach revealed that people differ in their sensitivity to daily weather changes, independent of personality traits represented in the Five Factor Model, gender, or age. The exploratory approach of the present study in studying the relation between weather and mood can be used as a starting point for further research on this topic.

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