Extreme temperatures: Gender differences in well-being

Ignacio Belloc[1,2], José Ignacio Gimenez-Nadal[1,2,*], José Alberto Molina[1,2,3]

[1] University of Zaragoza (UNIZAR) and Institute of Employment, Digital Society and Sustainability (IEDIS), Zaragoza, Spain

[2] Global Labor Organization (GLO), The Netherlands

[3] Institute of Labor Economics (IZA), Bonn, Germany

Abstract

Climate change and global warming have significant implications for people worldwide, necessitating an understanding of how extreme weather conditions affect individuals. This study investigates the relationship between individual affective well-being and extreme temperatures, using data from the American Time Use Survey's Well-Being Module for multiple years. The analysis focuses on daily variations in weather conditions at the county level in the United States. Findings reveal gender-specific outcomes, with males being more susceptible to extreme temperatures. On days with maximum temperatures exceeding 80ºF, males experience higher levels of fatigue and stress, as well as reduced happiness and meaningfulness, compared to days with temperatures around 70ºF. The study suggests that the negative impact on males' sleep quality may contribute to these gender disparities. Additionally, warmer states have witnessed a decline in the male population over the past four decades. These results offer valuable insights into the gender-specific, affective well-being consequences of climate change, emphasizing the need for gender-sensitive approaches in designing comprehensive strategies for climate mitigation and adaptation.

Keywords: gender, weather conditions, extreme temperatures, well-being, time use, United States

JEL Codes: I31, J16, Q54

[*] I. Belloc: ibelloc@unizar.es; https://orcid.org/0000-0003-1081-4107

J.I. Giménez-Nadal: ngimenez@unizar.es; https://orcid.org/0000-0002-1610-5451

J.A. Molina: jamolina@unizar.es; https://orcid.org/0000-0002-9437-4606

Correspondence to: J.I. Gimenez-Nadal. Department of Economic Analysis, University of Zaragoza. C/ Gran Vía 2, 50005 Zaragoza, Spain.

Acknowledgements: The authors are grateful for the comments of the participants in the 2nd IEDIS Congress (Zaragoza, 2023) and the 25th Spanish Applied Economics Meeting (Toledo, 2023). This paper has benefitted from funding from the Government of Aragón [Project S32_23R]. I. Belloc gratefully acknowledges support from the Spanish Ministry of Science, Innovation and Universities [FPU research fellowship Ref. FPU20/03564].

Declarations of interest: The authors declare that they have no conflict of interest.

1. Introduction

Climate change and global warming have detrimental effects on individual well-being. Rising temperatures contribute to heat-related illnesses and extreme weather events, causing injuries (Dillender, 2021; Somanathan et al., 2021; Filomena and Picchio, 2023), displacement (Marchiori et al., 2012; Cattaneo and Peri, 2016; Gröger and Zylberberg, 2016; Peri and Sasahara, 2019; Helbling and Meierrieks, 2023) and loss of life (Deschênes and Greenstone, 2011; Barreca et al., 2016; Liao et al., 2023). Changing climate patterns worsen the spread of diseases like malaria (Siraj et al., 2014; Flückiger and Ludwig, 2022). Agricultural productivity declines, leading to food shortages, price volatility, and malnutrition, particularly affecting vulnerable communities (Cartel et al., 2018; Sperry et al., 2019; Li, 2023). Water scarcity increases, compromising access to clean water and sanitation (Distefano and Kelly, 2017). Extreme weather events, such as earthquakes, floods, hurricanes, tropical cyclones, and tsunamis, cause considerable damage to physical infrastructures, homes, and businesses, impacting livelihoods. Climate change also takes a toll on mental health, causing stress, anxiety, depression, hospital emergency visits, and suicides (Noelke et al., 2016; Burke et al., 2018; Obradovich et al., 2018; Mullins and White, 2019; Hou et al., 2023; Hua et al., 2023). Climate change exacerbates social inequalities, disproportionately affecting marginalized groups and widening socioeconomic disparities (Diffenbaugh and Burke, 2019; Paglialunga et al., 2022; Pleninger, 2022). Addressing climate change is crucial to protect well-being and ensure a sustainable future for all.

Individual well-being can be evaluated using both objective and subjective measures. Objective measures include factors like income, health status, and inequality, while subjective measures encompass emotions such as happiness, sadness, stress, and fatigue. In recent years, there has been a growing focus on subjective well-being and the inclusion of non-income-based measures in policy-making and assessments, as objective measures alone provide an incomplete understanding of quality of life (Diener and Seligman, 2004; Diener, 2006; Dolan et al., 2008; Diener and Ryan, 2009; Stiglitz et al., 2009; Senik, 2014; Graham and Ruiz Pozuelo, 2017). Subjective well-being refers to an individual's personal perceptions and judgments regarding life satisfaction and happiness (Kahneman et al., 1999). This approach has gained popularity among researchers and policymakers. Enhancing subjective well-being, quality of life, and life satisfaction has become a crucial policy objective for societal progress and improved standards of living (Fitoussi and

Stiglitz, 2012; Steptoe et al., 2015). Consequently, there has been a surge in empirical research examining the determinants and consequences of subjective well-being, with scholars in a range of various disciplines offering interventions for policymakers to enhance well-being and overall national health.

The impact of daily weather conditions on daily feelings and emotions has been largely overlooked. With the increasing frequency and magnitude of extreme weather events due to climate change, it is important to understand the effect of weather conditions on well-being. Climate change has been shown to negatively impact mortality (Deschênes and Greenstone, 2011; Barreca et al., 2016; Yu et al., 2019; Liao et al., 2023; Nguyen et al., 2023), mental health (Mullins and White, 2019; Li et al., 2020; Hou et al., 2023; Hua et al., 2023), work absenteeism (Somanathan et al., 2021; Heyes and Saberian, 2022), and subjective well-being (Connolly, 2013; Noelke et al., 2016; Frijters et al., 2020).

This study analyzes the relationship between subjective well-being and daily weather conditions, using data from the American Time Use Survey Well-Being Module (henceforth ATUS WB-Module) for the years 2010, 2012, 2013 and 2021. The study examines how levels of happiness, meaningfulness, sadness, stress, fatigue, and pain experienced during daily activities are related to extreme temperatures. Unlike prior studies, this analysis includes data from four entire years and is not restricted to a specific season, providing more robust and generalizable results. The study uses a large nationally representative sample of the US adult population, making the findings of broad interest.

The findings of the study suggest that weather conditions on the survey day have an impact on subjective well-being. Specifically, there is a clear relationship between maximum temperatures and subjective well-being. However, there are important gender-specific differences, with males being more sensitive to extreme temperatures. Higher temperatures are found to decrease the overall affect of males, possibly due to reduced feelings of happiness and meaningfulness, as well as higher levels of stress and tiredness. In contrast, no relationship is found between extreme temperatures and subjective well-being in female respondents. Additionally, the study provides evidence for a potential mechanism behind these findings, including a link between higher maximum temperatures and poorer sleep quality in males. Furthermore, there are relatively fewer males – as measured by sex ratios – in those states with higher maximum temperatures, which may indicate that temperature – and wheather conditions – is related to the location and migration decisions of the population.

This study makes three contributions to the literature. First, it contributes to the well-being literature by examining how day-to-day weather conditions impact individual self-reported well-being (Connolly, 2013; Frijters et al., 2020). While previous studies have looked at how weather conditions affect overall life evaluations or instant feelings, there is, as yet, no conclusive evidence. This study is the first to use nationally representative time use diary data from the US. Second, most existing research focuses on cognitive measures of well-being, such as life satisfaction or self-rated health, but this study examines six different affective measures of instant feelings. Third, the study goes beyond examining the relationship between weather and well-being and aims to understand the potential mechanisms behind these effects. Additional analyses are conducted to explore the effects of extreme temperatures on sleep quality measures and the geographical distribution of the population in the US.

The rest of the paper is organized as follows. Section 2 provides a literature review on the relationship between weather conditions and subjective well-being in the US. Section 3 presents data and the construction of the variables used in the paper, together with certain descriptive statistics. Section 4 introduces the econometric strategy. Section 5 shows the empirical findings of the paper and Section 6 concludes.

2. Literature review

Recent research has focused on the relationship between weather conditions and health outcomes, particularly in terms of well-being. Despite these efforts, there are still gaps in the literature, particularly in the context of the United States where the existing evidence is mixed. Studies exploring the relationship between cognitive and affective measures of well-being and weather conditions include the works of researchers such as Connolly (2013), Lucas and Lawless (2013), Noelke et al. (2016), and Frijters et al. (2020).[1]

In Connolly's (2013) study, data from the Princeton Affect and Time Survey (PATS) is used to examine the relationship between weather conditions and well-being[2], finding

[1] We focus in this literature review on studies located in the US. For studies in other geographical contexts, we can cite those of Kämpfer and Mutz (2013) and Schmiedeberg and Schröder (2014) in Germany, Feddersen et al. (2016) in Australia, and Barrington-Leigh and Behzadnejad (2017) in Canada.

[2] As the ATUS WB-Module, the PATS collects contemporaneous subjective-wellbeing using the DRM for only three of the many activities in which respondents had engaged the previous day, with the exception of sleep, grooming, and private activities. Both PATS and ATUS respondents show reported values of 0 to 6 for each instant-feeling for each of three randomly selected activities.

that women are more responsive than men to temperature and precipitation. Rainier days and higher temperatures significantly decrease life satisfaction for females. Additionally, Connolly investigates emotional variables and a range of different affective measures and finds that low temperatures increase happiness and decrease tiredness, stress, sadness, and the U-index for women. Moreover, a rise in net affect for low temperatures and a decrease for very high temperatures is found, again only for women. In contrast, no statistically significant effects are found for males. Connolly tentatively concludes that women appear to be more responsive to environmental variables. However, a limitation of her study is that it only focuses on one season, Summer 2006, due to data availability, which restricts the analysis of other weather conditions. In contrast, our study incorporates data from four distinct survey years, providing more comprehensive information for empirical analyses. In stark contrast to Connolly's findings, this study reveals that males appear to be more responsive to environmental variables, particularly daily maximum temperatures.

Another study examining cognitive measures of subjective well-being in the United States is conducted by Lucas and Lawless (2013), focusing on the association between daily weather conditions and life satisfaction, and specifically investigating whether life seems better when the weather is good. Using a representative cross-sectional sample of over one million Americans over a 5-year period, from the Behavioral Risk Factor Surveillance System (BRFSS), the authors find that weather does not significantly impact life satisfaction. Even for the estimates that do show statistical significance, the effects are very small. This may be explained by the possibility that the effects of weather conditions are more immediate and short-term, with individuals adapting over time and experiencing diminishing effects.

Other studies conducted in the United States include Noelke et al. (2016) and Frijters et al. (2020). Noelke et al. (2016) analyze data from the Gallup G1K dataset, from 2008 to 2013, finding that temperatures above 70ºF, compared to temperatures in the 50-60ºF range, decrease happiness and increase feelings of stress, anger, and fatigue. Frijters et al. (2020) utilize the Gallup Daily tracking survey and show that both temperature and precipitation have no clear effects on cognitive measures of well-being (such as life satisfaction and self-reported health) and affective measures (using an index of positive emotions).

From our perspective, the aggregation of different emotions in Frijters et al. (2020) risks overlooking important variations in instant emotions. Our research takes advantage of the multitude of affective information on instant feelings, supporting the hypothesis that considering individual emotions can yield significant insights. Moreover, Frijters et al. (2020) only assess feelings of enjoyment, sadness, stress, or happiness for the previous full day, using dichotomous responses (yes or no).

The existing studies on weather conditions and well-being in the United States have produced mixed findings, with some showing associations while others find no relationships between the two factors. Our aim is to contribute to the literature by utilizing data from the ATUS WB-Module, conducted in four recent survey years (2010, 2012, 2013, and 2021). We link individual and episode-level characteristics collected in the ATUS with weather data obtained from the National Climatic Data Center (NCDC) at the county level. Using county-level information allows for more precise regional analysis and, by matching individual and well-being data with weather variables, we can examine the relationship between weather conditions and well-being more comprehensively.

3. Data and variables

Our data is sourced from two primary organizations, the ATUS and the National Climatic Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA). The ATUS, which is a collaborative effort between the Bureau of Labor Statistics and the US Census Bureau, has been conducted annually since January 2003. It is a publicly accessible time-diary study that provides nationally representative data on the activities of Americans who are at least 15 years old throughout a 24-hour period on a specific day of the week (referred to as the "diary day"). The data collection process involves randomly selecting respondents from the Current Population Survey (CPS) and conducting computer-assisted telephone interviews (CATI) on a daily basis. The distribution of ATUS diary days throughout the year is designed to be evenly spread across different weeks, ensuring comprehensive coverage and a representative snapshot of daily life throughout the week. The focus of analysis within the ATUS is on individuals, with each surveyed household having only one individual providing data, although some information about the entire household is also included.

The ATUS includes a special module that consists of additional questions on a topic of public interest, typically related to time use. In certain years (2010, 2012, 2013, and 2021), the ATUS conducted a WB-Module, which collected affective data for three randomly chosen activities reported by each respondent that lasted for at least 5 minutes. This module focused on measuring feelings of happiness, sadness, fatigue, pain, and stress during each activity, using a 7-point Likert scale ranging from 0 (indicating a low intensity or not experiencing the feeling at all) to 6 (indicating a high intensity or extremely strong feeling). Additionally, participants were asked about the meaningfulness of each activity. By using data from all available waves of the ATUS WB-Module, the relationship between weather and subjective well-being can be examined. The WB-Module, which collects data on feelings during activities, was administered at the end of the ATUS interview. This method of measuring feelings is similar to a partial Day Reconstruction Method (DRM), as it does not capture well-being ratings for every episode of the day, due to limitations on time and resources. In contrast, the DRM collects well-being information for all episodes throughout the day.

Two latent variables are constructed from the six feelings measured: net affect and the U-index. Net affect represents overall mood and is calculated by subtracting the mean of negative emotions (pain, sadness, fatigue, and stress) from the mean of positive emotions (happiness, meaningfulness) experienced during a particular activity. This yields a net affect score ranging from 6 to -6, where 6 represents the highest possible positive mood and -6 represents the lowest possible negative mood. This measure has been widely used in similar studies as a reliable predictor of overall self-ratings of happiness (Bradburn, 1969; Kahneman et al., 2006; Kahneman and Krueger, 2006).

The U-index, on the other hand, is a binary variable that classifies an activity as "unpleasant" if the maximum rating for any of the negative feelings (sadness, stress, fatigue, pain) is higher than the maximum rating for any of the positive feelings (happiness, meaningfulness) during that activity. If the maximum negative rating is not greater than the maximum positive rating, the U-index is set to 0. This indicates the predominance of negative emotions over positive ones during a given activity and measures the proportion of time an individual spends in an unpleasant state (Kahneman and Krueger, 2006).

The ATUS data set was enriched with weather information by incorporating details about the diary day and county of the interview.[3] This allowed for a consistent assessment of weather conditions experienced by respondents within a particular county on the survey diary day, the preceding day of the ATUS interview, and the date when respondents reported their well-being. By utilizing the county as the primary unit of geographical analysis, we can effectively examine the connection between weather and well-being, as it provides the most appropriate geographic delineation for this purpose.

Historical weather data for precipitation, snowfall, and temperature were sourced from the NCDC of the NOAA.[4] The NCDC offers a comprehensive collection of weather data from numerous weather stations throughout the United States. In this study, data for all variables were gathered at the county level, utilizing daily measurements from a total of 19,729 meteorological stations located across the US. The precipitation and snowfall variables were initially recorded in inches, while the maximum temperature variable was measured in degrees Fahrenheit.[5]

In addition to the 24-hour time diary and well-being questions, the ATUS dataset offers extensive information on the demographic and household characteristics of respondents. These variables serve as covariates in our models, considering prior research into the factors influencing subjective well-being. By incorporating these covariates, we aim to account for various factors that may influence subjective well-being in our models. The demographic and household variables included in our analysis include gender, categorized as a binary variable (where 1 indicates male and 0 represents female or other), age measured as a continuous variable, representing the respondent's age in years, native status, controlled by a dummy variable, with a value of 1 for respondents born in the US and 0 for those who are foreign-born, education level, transformed into three binary variables to capture different levels of education attainment (less than high school, some high school, and some college or more), labor force status, encoded as a dummy variable, with a value of 1 for employed respondents and 0 for those who are not employed, marital status, measured through a dummy variable, with a value of 1 indicating respondents who report having a partner (either married or cohabiting), and health status, controlled

[3] The county of residence is available for counties over 100,000 inhabitants, identified in the survey.

[4] The weather data were retrieved from https://www.ncdc.noaa.gov/cdo-web/datatools.

[5] Although a variety of weather-related variables are available, most stations only report total amount of precipitation, snowfall, minimum temperature, and maximum temperature for the day.

through a dummy variable, where a value of 1 indicates respondents reporting excellent, very good, or good health, while 0 represents fair or poor health.

Other variables defined at the household level include the number of people in the household, the number of children under age 18 in the household, and family income, referring to the gross income of the household. The original categorical variable was reclassified into three categories (low, middle, and high) using thresholds set at $25,000 and $75,000

Regarding the characteristics of episodes, we take into account several factors in our analysis. These include episode duration, measured in minutes and transformed into logarithmic terms to accommodate the right-skewness typically observed in time use data, activity categories, capturing the specific type of activity the respondent engaged in during the episode, the presence of others, indicating whether there were other individuals present while the respondent was involved in the episode, the location of activity, describing where the activity took place, including home, outdoors, indoors, or while traveling (this information was obtained through a question asking, "Where were you?") and diary day characteristics, since the diary day can fall on any date, so we control for whether it was a weekend and/or a holiday. Weekends and holidays may generally contribute to improved well-being, as individuals often have more leisure time and fewer time constraints to engage in enjoyable activities. We incorporate these episode characteristics to gain a comprehensive understanding of the factors influencing subjective well-being. For a more detailed explanation of each variable's definition, please refer to Appendix Table A1

In the ATUS there are more than 470 activity codes and we reclassify each activity into fourteen activity categories: cooking, shopping, other housework, childcare, market work, outdoor leisure, indoor leisure, entertainment, socializing, religious, hobbies, reading, sports, and personal care. Our classification of leisure activities closely follows the framework proposed by Aguiar and Hurst (2007). For a comprehensive list of activities contained within each of these fourteen time-use categories, please refer to Appendix Table A2.

Table 1 presents the descriptive statistics for all key variables, including subjective measures, episode characteristics, weather variables, and socio-demographic controls. It provides an overview of the summary statistics for the dependent variables, control variables, and weather variables. The first eight rows of Table 1 display the average levels

of feelings experienced during different activities, specifically for the three randomly selected activities with subjective well-being information. On a scale ranging from 0 to 6, the average levels of happiness, meaningfulness, sadness, stress, tiredness, and pain are 4.394, 4.368, 0.603, 1.467, 2.273, and 0.877, respectively. The net affect, which represents the difference between the average positive and negative feelings, has a sample average of 3.076, while the average U-index is 0.132.

Regarding episode characteristics, the average duration of each activity is 167 minutes. Approximately 69.1% of the activities are performed in the presence of another person. Furthermore, 58.1% of the activities take place at home, 6.5% outdoors, 27.9% indoors, and 7.5% while traveling. In terms of the sampled diary days, 32.6% correspond to weekends and 2.4% are holidays. These percentages reflect the proportion of diary days falling on weekends and holidays in our sample.

The average daily maximum temperature recorded as weather conditions is approximately 70.9 degrees Fahrenheit. The distribution of temperature is as follows: 14.4% of days have temperatures below 50ºF, 11.3% have temperatures between 50 and 60ºF, 16.1% have temperatures between 60 and 70ºF, 20.8% have temperatures between 70 and 80ºF, 25% have temperatures between 80 and 90ºF, and 12.4% have temperatures exceeding 90ºF.

In terms of socio-demographics, men account for slightly less than half of the sample, around 48%. The average age of respondents in our sample is approximately 42 years old. Additionally, 78.3% of individuals are native citizens. Regarding education, 17% of individuals have less than a high school education, 25.7% have obtained a high school diploma, and 57.3% have completed at least some college education. Moreover, 62% of respondents are part of the labor force. Furthermore, 83.8% of individuals declare having an excellent, very good, or good general health status, indicating a favorable overall health perception among the respondents.

Regarding household characteristics, around half of the sample lives with a partner (married or unmarried). The average number of household members is 3.36, and the average number of children in the household is 1. Concerning household socio-economic status, 19.1% of households in the sample fall within the low-income range (household earnings lower than $25,000), 43% fall within the middle-income range ($25,000 to $75,000), and 37.9% have incomes exceeding $75,000.

4. Econometric strategy

To examine the relationship between weather conditions and well-being, we employ ordinary least squares (OLS) regression models while considering the sampling weights provided by the ATUS. Clustered standard errors by individual are adjusted in order to account for correlation within individuals, as the data contains multiple observations from each respondent. For binary dependent variables, such as the U-index, we estimate linear probability models, while for continuous dependent variables like happiness, meaningfulness, sadness, stress, tiredness, pain, and net affect, we use OLS models.

To address the differences in the fraction of time spent on eligible activities and the probability of selecting an eligible activity in the module, we apply activity-level weights. These weights help account for various aspects of the ATUS sample design and data collection process, including the oversampling of certain demographic groups and weekends, nonresponse rates, and the requirement that activities should be at least 5 minutes in duration. By using activity weights, we can appropriately adjust and compensate for these important aspects. It is worth noting that subjective well-being questions are asked for three activities specifically, which is why activity weights are utilized in our analysis.[6]

The decision to use the OLS estimator in our analysis is based on its simplicity and ease of interpreting results. Coefficients in the linear model can be directly interpreted as marginal effects, providing a quantitative understanding of the relationship between variables. In contrast, ordered models, such as ordered logit or probit models, do not allow for direct quantitative interpretation of coefficients. Prior research has demonstrated that the cardinal models (OLS regressions) and ordinal models (ordered latent response models) yield very similar results, at least qualitatively. Studies by Ferrer-i-Carbonell and Frijters (2004) and Rasciute et al. (2023) have supported this finding. Therefore, considering the similarity in results between cardinal and ordinal models, we choose to adopt a cardinal interpretation of individual responses, even though the survey provides ordinal measures of affective well-being.

[6] Note that our unit of analysis is activity, rather than individual. Thus, we cluster the standard errors on the person because the data contains multiple observations from each respondent (i.e., 3 episodes are from the same respondent). Additionally, we test the results with regard to clustering on the state level, to allow the correlation of error terms for individuals who live in the same state across time, and the results are robust to the cluster level. Those results are available from the authors upon request.

Specifically, we estimate the following linear regression, separately by gender:

$$SWB_{ijk,t} = \alpha_0 + W_{j,t}\delta + X_{ij,t}\beta + E_{ijk,t}\Upsilon + \Phi_s + \theta_m + \tau_t + \varepsilon_{ijk,t} \quad (1)$$

In all models, subscript i denotes individuals, j denotes county of residence, k denotes episode and t denotes survey years. The dependent variable, $SWB_{ijk,t}$, is the feeling or measure of subjective well-being (happiness, meaningfulness, sadness, fatigue, stress, pain, net affect or U-index) reported by respondent i in county j at time t during episode k, where time is expressed in terms of the year, month and day of interview. We standardize each continuous instant feeling measure (happiness, meaningfulness, sadness, fatigue, stress, pain, net affect) to have a mean of 0 and a standard deviation of 1 for ease of interpretation (i.e., estimated coefficients can be interpreted as the change in terms of one standard deviation of each well-being measure). $X_{ij,t}$ represents a vector of socio-demographic characteristics of individual i. $W_{j,t}$ is a vector of county-level weather variables, the main independent variables in our models, and $E_{ijk,t}$ is a vector of episode characteristics. The individual control variables include age and its square (divided by 100), being a native (ref.: immigrants), highest education completed (ref.: primary education), employment status (ref.: not in labor force), married or cohabiting (ref.: not cohabiting), the family size, the number of children in the household, total household income (ref.: low household income, less than $25,000), and health status (ref.: fair, poor). Most of these variables have been demonstrated to have an impact on well-being by prior research (Dolan et al., 2008; Kahneman and Deaton, 2010).

Moreover, we also account for episode characteristics in our analysis, since prior research has demonstrated that affective outcomes can vary based on activity characteristics (Kahneman et al., 2004). Specifically, we control for the type of activity, with personal care serving as the reference category. We also consider the duration of the activity in minutes, the location of the activity (home, indoors, outdoors, with traveling as the reference category), whether the respondent interacted with someone else during the activity (e.g., spouse, parent, children, other family members, friends), and whether the diary day falls on a weekend or holiday.

Regarding weather characteristics, we focus on the daily maximum temperature. We include the maximum temperature on the diary day (denoted as "t") in the county (denoted as "j") as dummy variables in 10ºF ranges. The reference category is set as 70-80ºF. We choose to use the maximum temperature rather than the daily average as most individuals

are typically asleep during minimum temperature occurrences (Graff Zivin and Neidell, 2014; Krüger and Neugart, 2018). Additionally, maximum temperatures are highly correlated with average and minimum temperatures in our sample, with correlation coefficients of 0.981 and 0.918, respectively, and statistically significant at the 99% confidence level. Consequently, the parameter δ represents the impact of an additional day within a specific temperature range on each instantaneous feeling outcome variable, relative to the impact of a day within the 70-80ºF range.

To account for time-specific fixed effects, we incorporate year dummies (τ_t) indicating the year in which the survey was conducted. These dummies help control for unobserved factors specific to a particular year, such as survey issues and macroeconomic conditions. The reference year is 2010. Additionally, the variable θ_m represents month dummies to capture any seasonal patterns in subjective well-being (with December serving as the reference month category). To account for regional heterogeneity and address any unobserved characteristics at the state level, we include US state of residence fixed effects denoted as Φ_s. These fixed effects control for permanent (time-invariant) state characteristics that may simultaneously influence daily maximum temperature and subjective well-being, such as latitude, longitude, elevation, and other factors. The error term is described by $\varepsilon_{ijk,t}$, representing the standard errors.

5. Results

Tables 2 and 3 present the OLS estimates that examine the relationship between daily maximum temperature and individual instant well-being, including happiness, meaningfulness, sadness, stress, tiredness, pain, net affect, and the U-index. The analysis takes into account demographic, household, episode, time, and state characteristics. The results are reported separately for males and females to explore any gender-specific differences and exposure to maximum temperatures.[7]

Our estimates reveal notable gender differences, indicating that males may be more sensitive to extreme maximum temperatures. Specifically, we find that days with

[7] To account for the ordinal nature of the dependent variables, which range from -6 to 6, we also conduct additional analyses using ordered models, such as ordered logit or probit models. These provide a robustness check and allow for a more nuanced understanding of the relationship between the variables. The results from the ordered models are consistent with the findings from the OLS models in terms of the direction and statistical significance of the coefficients. It is important to note that the coefficients themselves are not directly comparable across the different models. These results are available on request.

maximum temperatures above 80ºF, compared to days with maximum temperatures in the 70s range, are associated with negative effects on positive instant feelings such as happiness and meaningfulness, and positive effects on negative emotions like stress and fatigue, for males. When calculating the standard deviation for each instant-feeling, we observe that days with maximum temperatures around the 80s, relative to days with maximum temperatures in the 70s, are linked to a 0.125 increase in stress and a 0.178 increase in fatigue, both measured in standard deviations for males. Conversely, these same days are associated with a decrease of 0.133 standard deviations in happiness and a decrease of 0.138 standard deviations in meaningfulness. Consequently, days with maximum temperatures around the 80s correspond to a 19.3% decrease in the net affect and a 6% increase in the U-index, both measured in standard deviations. Moreover, for days with maximum temperatures above 90ºF, we document a positive relationship of 0.210 standard deviations in fatigue and a negative relationship of 0.159 standard deviations in the net affect for males. In contrast, for females, we only find one statistically significant coefficient at the 90% confidence level, which is associated with instant feelings on days with maximum temperatures above 90ºF. Specifically, these days are positively related to the feelings of interest, indicating an increase of approximately 0.100 standard deviations in meaningfulness.

These findings suggest that gender differences exist in the relationship between maximum temperatures and instant well-being, with males exhibiting a stronger sensitivity to extreme temperatures, compared to females.

In Appendix B, we present Tables B1 and B2, providing estimates separated by gender after incorporating additional controls for other meteorological variables. Specifically, we include variables such as precipitation and snowfall intensity on the diary day, as well as the difference in maximum temperature, precipitation, and snowfall from the previous day. We include these estimates in Appendix B because we did not identify substantial differences across gender, and the main results related to maximum temperature remain robust, even with this alternative specification.

In Tables B3 and B4, we introduce an additional control variable, namely life satisfaction (z-score). This variable is based on the Cantril Ladder life satisfaction question, which asks respondents to rate their overall quality of life on a scale from 0 to 10. We include this variable in the analysis for the years 2012, 2013, and 2021, as the ATUS collected data on life satisfaction during these specific survey years. We do not

include this variable in the main specification because it is not available for the 2010 survey year.

We conduct a simple placebo or falsification test in Tables B5 and B6. In these tables, we re-estimate the main specification using weather data from the year prior to the survey day, instead of the same day. The remaining specification remains unchanged. The results from this placebo test do not yield similar findings to those presented in Tables 2 and 3, suggesting that the relationship between temperature and well-being is not spurious.

Additionally, as a further placebo test, Tables B7 and B8 present estimates using maximum temperature information from a randomly selected county on the diary day. This serves as a test to determine if the specific county's temperature has a causal impact on well-being. (Further details on additional placebo tests are available upon request).

Potential mechanisms

We delve into the potential mechanisms underlying our main well-being estimates, as presented in Tables 2 and 3. Our findings suggest that males exhibit heightened sensitivity to extreme temperatures, resulting in increased fatigue and stress, as well as reduced levels of happiness and meaningfulness. We focus our analysis on two potential factors: sleeping time and quality, as well as the population's location.

First, sleeping time and quality may play a crucial role in understanding the relationship between temperature and well-being. Extreme temperatures can disrupt sleep patterns, leading to inadequate sleep duration and poor sleep quality. Such disturbances can contribute to increased fatigue and stress levels, which align with our observed effects in males. Future research exploring the mediating role of sleep in the temperature-well-being relationship could provide valuable insights.

Second, the population's location could also contribute to the gender-specific differences in well-being responses to extreme temperatures. Geographic factors, such as latitude, elevation, and climate characteristics, vary across regions. Males may be more exposed to outdoor activities or occupational tasks that make them more susceptible to extreme temperatures, leading to heightened well-being impacts. Further investigations into the interplay between location, activity patterns, and temperature effects on well-being could enhance our understanding of these gender differences.

By examining these potential mechanisms, we aim to shed light on the pathways through which extreme temperatures impact well-being differentially for males and females. However, it is important to note that our analysis is exploratory, and further research is warranted to provide comprehensive insights into the underlying mechanisms driving these gender-specific effects.[8]

To further explore potential mechanisms, we first examine the relationship between extreme temperatures and both sleep time and sleep quality. For sleep time, we utilize data from the ATUS covering the years 2003-2019 and 2021. We obtain daily sleeping time (measured in minutes per day) and regress it, after applying a logarithmic transformation, on the same set of individual and weather characteristics as specified in Equation (1). In addition, we investigate sleep quality using information obtained from a question asked in the ATUS WB-Module. Respondents were asked to rate how well-rested they felt on the previous day, with potential answers ranging from 'Very' (1), 'Somewhat' (2), 'A little' (3), to 'Not at all' (4). To facilitate interpretation, we reverse the scale of this variable so that higher values indicate better sleep quality.

The effects of maximum temperatures on both sleep time and sleep quality are estimated, and the results are presented in Table 4. Our findings suggest that, for males, days with maximum temperatures above 80ºF, compared to days with maximum temperatures around 70ºF, are associated with an increase in total sleeping time. This indicates that warmer temperatures are related to males sleeping for longer to achieve adequate rest. However, when examining sleep quality, we observe that for males, days with maximum temperatures in the range of 80-90ºF are associated with lower sleep quality. This finding may help explain why males report higher levels of fatigue on days with maximum temperatures above 80ºF. The results indicate that higher temperatures are linked to poorer sleep quality, which in turn may necessitate longer sleep duration for males to feel adequately rested.

These findings suggest that sleep time and sleep quality are potential mechanisms through which extreme temperatures affect well-being differently for males. The

[8] In the ATUS WB-Module there is some information about cognitive measures of well-being, such as general health status. Specifically, the question is, “Would you say your health is excellent (1), very good, good, fair, or poor (5)?”. We use this question to study the relationship between general health status and maximum temperatures and display the results in Table C1 in Appendix C. Results do not suggest any relationship with maximum temperature, neither for the pooled sample nor the gender sub-sample.

association between temperature and sleep provides valuable insights into the underlying processes contributing to gender-specific responses to extreme temperatures.

In order to investigate potential links like these, we utilize cross-sectional data from the Integrated Public Use Microdata Series (IPUMS) sample of the Current Population Survey (CPS) spanning the years 1980 to 2021. We calculate the state average sex ratio, the ratio of males to females, by pooling the data across these years.

In Figure 1, we present a scatter plot depicting both the state average sex ratio and maximum temperature over the four-decade period. Additionally, we include a trend line and associated confidence intervals to provide further insights. The scatter plot reveals a negative relationship between the state average sex ratio and maximum temperatures. This suggests that states with higher maximum temperatures tend to exhibit a lower number of males on average, compared to females.

While the literature on climate change and migration, particularly in the context of heat and migration, lacks consensus (Nguyen, 2021; Luong et al., 2023), our scatter plot provides interesting evidence from a gender perspective. It implies that males may exhibit a tendency to avoid or migrate out of warmer states within the United States. This observation contributes to the relatively underdeveloped field of research on the relationship between heat and migration, specifically from a gender standpoint. The findings shed light on the potential gender-specific dynamics associated with heat and migration, adding a new dimension to this area of study.

Overall, our analysis offers new evidence and insights into the intersection of temperature, migration, and gender, providing a foundation for further exploration and understanding of these complex relationships. [9]

6. Conclusions

This paper presents evidence on the relationship between weather conditions and subjective well-being, using nationally representative data from the American Time Use Survey (ATUS) and weather information from the National Climatic Data Center (NCDC). The study utilizes a special supplement to the ATUS conducted in 2010, 2012,

[9] Future studies must investigate the possible implications of climate change from the population's location perspective, such as forced migration. This is beyond the scope of this paper and requires additional investigation. Specifically, future research should use econometric techniques to dig deeper into the relationship between extreme temperatures and migration in the US, using data at the state or county level, and controlling for different characteristics at the micro- and macro-level.

2013, and 2021, which includes the Well-Being Modules. The focus is on the United States, given the availability of data and the country's broad coverage. By utilizing data from four entire years, this study provides more robust estimates compared to prior research that often focused on specific seasons, which can introduce bias.

The empirical analysis covers a sample of 17,499 individuals, with over 69,000 pooled observations, contributing to the existing literature on the health impacts of climate change from both subjective well-being and gender perspectives. Notably, the finding that males appear to be more sensitive to temperature is a novel result and suggests that global climate change could have negative affective well-being consequences for males. This contrasts with prior research by Connolly (2013), which indicated that women were more affected by daily temperature, based on data from the summer of 2006.

The study also explores potential mechanisms and finds that higher temperatures are negatively associated with sleep quality in males. Additionally, the analysis reveals that warmer states have, on average, a lower proportion of males over the past four decades (1980-2021). These findings contrast with Frijters et al. (2020) and contribute to an understanding of the relationship between daily temperatures and subjective well-being, even after accounting for various well-being determinants, episode characteristics, and weather variables.

Comparing the estimates with other determinants of affective well-being, the study finds that extreme temperature has a larger impact on instant emotions than standard socio-demographic factors, such as age, native status, education level, marital status, and family size. Therefore, when using subjective well-being data, it is recommended for practitioners to control for daily weather conditions to avoid potential bias in affective well-being estimates.

However, it is important to note that the estimates are likely to be specific to the geographical context of the study. Further research in other areas is strongly recommended to validate and expand upon these findings. One major limitation of the current study is the inability to control for unobserved individual heterogeneity due to the cross-sectional nature of the data. Future research utilizing panel datasets would provide a more precise examination of the impacts of extreme temperatures on the well-being of the same individuals over time.

While the ATUS WB-Module reports subjective well-being for three episodes, the daily-level nature of temperature prevents the use of individual fixed-effects models. Information for the same respondent across different survey days is necessary. Alternative

datasets, such as the UK Time Use Survey (UKTUS), present some disadvantages to the current econometric strategy, as the geographical information is less detailed compared to the ATUS. Additionally, the UKTUS captures only a general emotion, instant enjoyment, for each activity performed during the diary day. Our study emphasizes the value of the ATUS WB-Module, which provides more informative measures of subjective well-being.

Future research could explore whether the findings extend to other health measures, such as depression or mental health scores using established measures, like the Centre for Epidemiological Studies Depression Scale (CES-D). Moreover, investigating other regional contexts, such as developing countries with significant agricultural sectors, where the effects of weather on well-being have received little attention, could be particularly important.

REFERENCES

Aguiar, M., & Hurst, E. (2007). Measuring trends in leisure: The allocation of time over five decades. *The Quarterly Journal of Economics*, 122(3), 969-1006. https://doi.org/10.1162/qjec.122.3.969

Barreca, A., Clay, K., Deschenes, O., Greenstone, M., & Shapiro, J. S. (2016). Adapting to climate change: The remarkable decline in the US temperature-mortality relationship over the twentieth century. *Journal of Political Economy*, 124(1), 105-159. https://doi.org/10.1086/684582

Barrington-Leigh, C., & Behzadnejad, F. (2017). The impact of daily weather conditions on life satisfaction: Evidence from cross-sectional and panel data. *Journal of Economic Psychology*, 59, 145-163. https://doi.org/10.1016/j.joep.2017.01.003

Bradburn, N. M. (1969). The structure of psychological well-being.

Burke, M., González, F., Baylis, P., Heft-Neal, S., Baysan, C., Basu, S., & Hsiang, S. (2018). Higher temperatures increase suicide rates in the United States and Mexico. *Nature Climate Change*, 8(8), 723-729. https://doi.org/10.1038/s41558-018-0222-x

Carter, C., Cui, X., Ghanem, D., & Mérel, P. (2018). Identifying the economic impacts of climate change on agriculture. *Annual Review of Resource Economics*, 10, 361-380. https://doi.org/10.1146/annurev-resource-100517-022938

Cattaneo, C., & Peri, G. (2016). The migration response to increasing temperatures. *Journal of Development Economics*, 122, 127-146. https://doi.org/10.1016/j.jdeveco.2016.05.004

Connolly, M. (2013). Some like it mild and not too wet: The influence of weather on subjective well-being. *Journal of Happiness Studies*, 14, 457-473. https://doi.org/10.1007/s10902-012-9338-2

Deschênes, O., & Greenstone, M. (2011). Climate change, mortality, and adaptation: Evidence from annual fluctuations in weather in the US. *American Economic Journal: Applied Economics*, 3(4), 152-185. https://doi.org/10.1257/app.3.4.152

Diener, E. (2006). Guidelines for national indicators of subjective well-being and ill-being. *Journal of Happiness Studies*, 7, 397-404. https://psycnet.apa.org/doi/10.1007/s10902-006-9000-y

Diener, E., & Ryan, K. (2009). Subjective well-being: A general overview. *South African Journal of Psychology*, 39(4), 391-406.

Diener, E., & Seligman, M. E. (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest*, 5(1), 1-31.

Diffenbaugh, N. S., & Burke, M. (2019). Global warming has increased global economic inequality. *Proceedings of the National Academy of Sciences*, 116(20), 9808-9813. https://doi.org/10.1073/pnas.1816020116

Dillender, M. (2021). Climate change and occupational health: Are there limits to our ability to adapt?. *Journal of Human Resources*, 56(1), 184-224. https://doi.org/10.3368/jhr.56.1.0718-9594R3

Distefano, T., & Kelly, S. (2017). Are we in deep water? Water scarcity and its limits to economic growth. *Ecological Economics*, 142, 130-147. https://doi.org/10.1016/j.ecolecon.2017.06.019

Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*, 29(1), 94-122. https://doi.org/10.1016/j.joep.2007.09.001

Feddersen, J., Metcalfe, R., & Wooden, M. (2016). Subjective wellbeing: Why weather matters. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, 179 (1), 203-228. https://doi.org/10.1111/rssa.12118

Ferrer-i-Carbonell, A., & Frijters, P. (2004). How important is methodology for the estimates of the determinants of happiness?. *The Economic Journal*, 114(497), 641-659. https://doi.org/10.1111/j.1468-0297.2004.00235.x

Filomena, M., & Picchio, M. (2023). Unsafe temperatures, unsafe jobs: The impact of weather conditions on work-related injuries. *IZA Discussion Paper No. 16169*.

Fitoussi, J. P., & Stiglitz, J. E. (2012). On the measurement of social progress and wellbeing: some further thoughts. *The Global Macro Economy and Finance*, 13-24. https://doi.org/10.1057/9781137034250_2

Flückiger, M., & Ludwig, M. (2022). Temperature and risk of diarrhoea among children in Sub-Saharan Africa. *World Development*, 160, 106070. https://doi.org/10.1016/j.worlddev.2022.106070

Frijters, P., Lalji, C., & Pakrashi, D. (2020). Daily weather only has small effects on wellbeing in the US. *Journal of Economic Behavior & Organization*, 176, 747-762. https://doi.org/10.1016/j.jebo.2020.03.009

Graff Zivin, J., & Neidell, M. (2014). Temperature and the allocation of time: Implications for climate change. *Journal of Labor Economics*, 32(1), 1-26. https://doi.org/10.1086/671766

Graham, C., & Ruiz Pozuelo, J. (2017). Happiness, stress, and age: How the U curve varies across people and places. *Journal of Population Economics*, 30, 225-264. https://doi.org/10.1007/s00148-016-0611-2

Gröger, A., & Zylberberg, Y. (2016). Internal labor migration as a shock coping strategy: Evidence from a typhoon. *American Economic Journal: Applied Economics*, 8(2), 123-153. https://dx.doi.org/10.1257/app.20140362

Helbling, M., & Meierrieks, D. (2023). Global warming and urbanization. *Journal of Population Economics*, 36(3), 1187-1223. https://doi.org/10.1007/s00148-022-00924-y

Heyes, A., & Saberian, S. (2022). Hot Days, the ability to Work and climate resilience: Evidence from a representative sample of 42,152 Indian households. *Journal of Development Economics*, 155, 102786. https://doi.org/10.1016/j.jdeveco.2021.102786

Hou, J., Wang, C., Wang, H., & Zhang, P. (2023). Effects of temperature on mental health: Evidence and mechanisms from China. *China Economic Review*, 79, 101953. https://doi.org/10.1016/j.chieco.2023.101953

Hua, Y., Qiu, Y., & Tan, X. (2023). The effects of temperature on mental health: evidence from China. *Journal of Population Economics*, 36, 1293-1332. https://doi.org/10.1007/s00148-022-00932-y

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Science*s, 107(38), 16489-16493. https://doi.org/10.1073/pnas.1011492107

Kahneman, D., & Krueger, A. B. (2006). Developments in the measurement of subjective well-being. *Journal of Economic Perspectives*, 20(1), 3-24. https://doi.org/10.1257/089533006776526030

Kahneman, D., Diener, E., & Schwarz, N. (Eds.). (1999). Well-being: Foundations of hedonic psychology. Russell Sage Foundation.

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science*, 306(5702), 1776-1780. https://doi.org/10.1126/science.1103572

Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. A. (2006). Would you be happier if you were richer? A focusing illusion. S*cience*, 312(5782), 1908-1910. https://doi.org/10.1126/science.1129688

Kämpfer, S., & Mutz, M. (2013). On the sunny side of life: Sunshine effects on life satisfaction. *Social Indicators Research*, 110, 579-595. https://doi.org/10.1007/s11205-011-9945-z

Krüger, J. J., & Neugart, M. (2018). Weather and Intertemporal Labor Supply: Results from German Time-Use Data. *Labour*, 32(1), 112-140. https://doi.org/10.1111/labr.12105

Li, M. (2023). Adaptation to expected and unexpected weather fluctuations: Evidence from Bangladeshi smallholder farmers. *World Development*, 161, 106066. https://doi.org/10.1016/j.worlddev.2022.106066

Li, M., Ferreira, S., & Smith, T. A. (2020). Temperature and self-reported mental health in the United States. *PloS one*, 15(3), e0230316. https://doi.org/10.1371/journal.pone.0230316

Liao, H., Zhang, C., Burke, P. J., Li, R., & Wei, Y. M. (2023). Extreme temperatures, mortality, and adaptation: Evidence from the county level in China. *Health Economics*, 32(4), 953-969. https://doi.org/10.1002/hec.4649

Lucas, R. E., & Lawless, N. M. (2013). Does life seem better on a sunny day? Examining the association between daily weather conditions and life satisfaction judgments.

Journal of Personality and Social Psychology, 104(5), 872. https://psycnet.apa.org/doi/10.1037/a0032124

Luong, T. A., Nguyen, M. H., Truong, N. K., & Le, K. (2023). Rainfall variability and internal migration: the importance of agriculture linkage and gender inequality. *Economic Analysis and Policy*, 77, 326-336. https://doi.org/10.1016/j.eap.2022.11.021

Marchiori, L., Maystadt, J. F., & Schumacher, I. (2012). The impact of weather anomalies on migration in sub-Saharan Africa. *Journal of Environmental Economics and Management*, 63(3), 355-374. https://doi.org/10.1016/j.jeem.2012.02.001

Mullins, J. T., & White, C. (2019). Temperature and mental health: Evidence from the spectrum of mental health outcomes. *Journal of Health Economics*, 68, 102240. https://doi.org/10.1016/j.jhealeco.2019.102240

Nguyen, C. V. (2021). Do weather extremes induce people to move? Evidence from Vietnam. *Economic Analysis and Policy*, 69, 118-141. https://doi.org/10.1016/j.eap.2020.11.009

Nguyen, C. V., Nguyen, M. H., & Nguyen, T. T. (2023). The impact of cold waves and heat waves on mortality: Evidence from a lower middle-income country. *Health Economics*, 32(6), 1220-1243. https://doi.org/10.1002/hec.4663

Noelke, C., McGovern, M., Corsi, D. J., Jimenez, M. P., Stern, A., Wing, I. S., & Berkman, L. (2016). Increasing ambient temperature reduces emotional well-being. *Environmental Research*, 151, 124-129. https://doi.org/10.1016/j.envres.2016.06.045

Obradovich, N., Migliorini, R., Paulus, M. P., & Rahwan, I. (2018). Empirical evidence of mental health risks posed by climate change. *Proceedings of the National Academy of Sciences*, 115(43), 10953-10958. https://doi.org/10.1073/pnas.1801528115

Paglialunga, E., Coveri, A., & Zanfei, A. (2022). Climate change and within-country inequality: New evidence from a global perspective. *World Development*, 159, 106030. https://doi.org/10.1016/j.worlddev.2022.106030

Peri, G., & Sasahara, A. (2019). The impact of global warming on rural-Urban migrations: Evidence from global big data. *NBER WP No. 25728*.

Pleninger, R. (2022). Impact of natural disasters on the income distribution. *World Development*, 157, 105936. https://doi.org/10.1016/j.worlddev.2022.105936

Rasciute, S., Downward, P., & Simmons, N. (2023). Valuation of subjective wellbeing and the role of marital status: Linear versus ordinal estimators. *Economic Modelling*, 123, 106260. https://doi.org/10.1016/j.econmod.2023.106260

Schmiedeberg, C., & Schröder, J. (2014). Does weather really influence the measurement of life satisfaction?. *Social Indicators Research*, 117, 387-399. https://doi.org/10.1007/s11205-013-0350-7

Senik, C. (2014). The French unhappiness puzzle: The cultural dimension of happiness. *Journal of Economic Behavior & Organization*, 106, 379-401. https://doi.org/10.1016/j.jebo.2014.05.010

Siraj, A. S., Santos-Vega, M., Bouma, M. J., Yadeta, D., Carrascal, D. R., & Pascual, M. (2014). Altitudinal changes in malaria incidence in highlands of Ethiopia and Colombia. *Science*, 343(6175), 1154-1158. https://doi.org/10.1126/science.1244325

Somanathan, E., Somanathan, R., Sudarshan, A., & Tewari, M. (2021). The impact of temperature on productivity and labor supply: Evidence from Indian manufacturing. *Journal of Political Economy*, 129(6), 1797-1827. https://doi.org/10.1086/713733

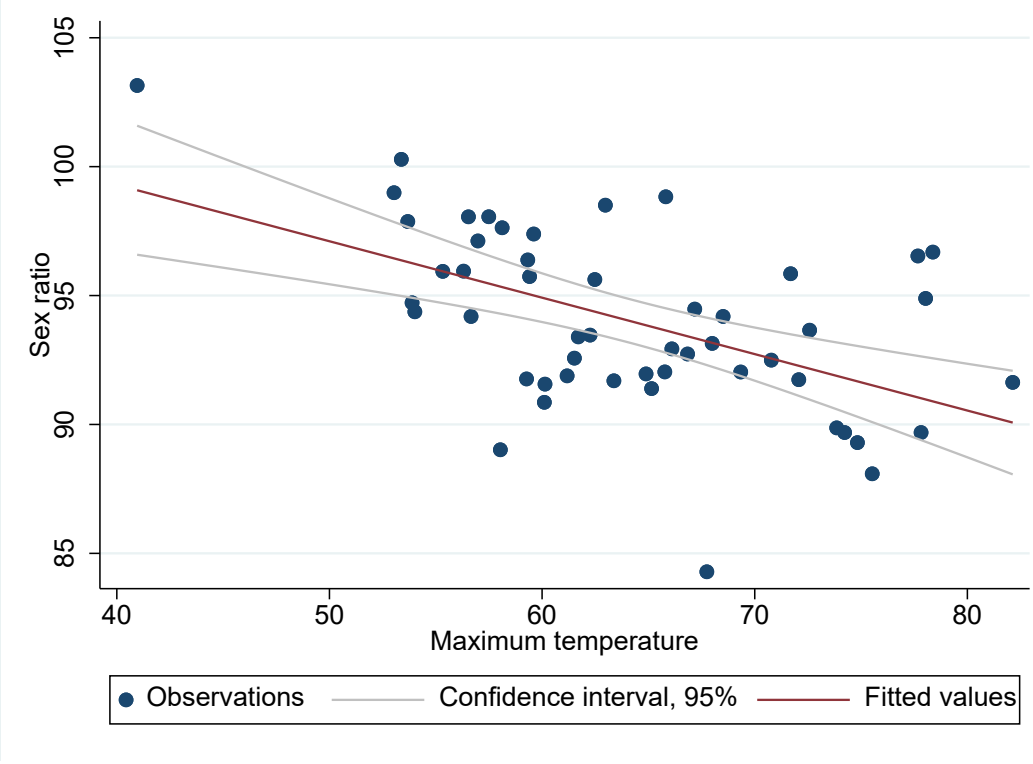
Sperry, J. S., Venturas, M. D., Todd, H. N., Trugman, A. T., Anderegg, W. R., Wang, Y., & Tai, X. (2019). The impact of rising CO2 and acclimation on the response of US forests to global warming. *Proceedings of the National Academy of Sciences*, 116(51), 25734-25744. https://doi.org/10.1073/pnas.1913072116

Steptoe, A., Deaton, A., & Stone, A. A. (2015). Subjective wellbeing, health, and ageing. *The Lancet*, 385(9968), 640-648. https://doi.org/10.1016/S0140-6736(13)61489-0

Stiglitz, R., Sen, A., & Fitoussi, J. (2009). Report by the Commission on the Measurement of Economic Performance and Social Progress. CMEPSP Report.

Yu, X., Lei, X., & Wang, M. (2019). Temperature effects on mortality and household adaptation: Evidence from China. *Journal of Environmental Economics and Management*, 96, 195-212. https://doi.org/10.1016/j.jeem.2019.05.004

Figure 1. Scatter plot of sex ratio vs. maximum temperature, state averages during 1980-2021



Notes: Author's own elaboration. Each circle represents the average sex ratio and maximum temperature in a state during 1980-2021. The red line trend describes the relation between sex ratio and maximum temperature in these states, whereas the grey lines represent the associated 95% confidence intervals.

Table 1. Summary statistics

	Mean	Std. Dev.	Minimum	Maximum
Instant feelings:				
Happy	4.394	1.585	0	6
Meaningful	4.368	1.845	0	6
Sad	0.603	1.320	0	6
Stress	1.467	1.806	0	6
Tired	2.273	1.925	0	6
Pain	0.877	1.581	0	6
Net affect	3.076	2.092	-6	6
U-index	0.132	0.338	0	1
Episode characteristics:				
Episode duration (minutes)	166.963	152.435	5	1,210
Episode with other	0.691	0.462	0	1
Episode at home	0.581	0.493	0	1
Episode outdoors	0.065	0.247	0	1
Episode indoors	0.279	0.448	0	1
Episode travelling	0.075	0.264	0	1
Weekend day	0.326	0.469	0	1
Holiday	0.024	0.152	0	1
Weather conditions:				
Maximum temperature	70.900	17.782	-6	115.278
Under 50s	0.144	0.351	0	1
50s	0.113	0.317	0	1
60s	0.161	0.367	0	1
70s	0.208	0.406	0	1
80s	0.250	0.433	0	1
90s	0.124	0.329	0	1
Socio-demographics:				
Male	0.480	0.500	0	1
Age	42.634	17.925	15	85
Native citizen	0.783	0.412	0	1
Primary education	0.170	0.376	0	1
Secondary education	0.257	0.437	0	1
University education	0.573	0.495	0	1
Employed	0.620	0.486	0	1
Married or cohabiting	0.526	0.499	0	1
Number of household members	3.357	1.788	1	15
Number of children	1.006	1.336	0	10
Low family income	0.191	0.393	0	1
Medium family income	0.430	0.495	0	1
High family income	0.379	0.485	0	1
Health status	0.838	0.369	0	1
Number of episodes	**69,167**			
Number of individuals	**17,499**			

Notes: Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. All observations are weighted using the activity weights provided by the ATUS.

Table 2. Relationship between maximum temperature and instant feelings, males

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s	-0.031	-0.018	0.129*	0.085	-0.017	0.054	-0.063	0.010
	(0.064)	(0.064)	(0.070)	(0.070)	(0.069)	(0.064)	(0.065)	(0.020)
50s	0.070	-0.107	0.099	0.032	0.023	0.022	-0.053	0.009
	(0.065)	(0.066)	(0.068)	(0.070)	(0.065)	(0.059)	(0.063)	(0.018)
60s	-0.087	-0.045	0.032	0.022	0.061	0.030	-0.083	0.005
	(0.059)	(0.049)	(0.058)	(0.056)	(0.054)	(0.050)	(0.055)	(0.015)
80s	-0.133**	-0.138***	0.022	0.125**	0.178***	0.041	-0.193***	0.060***
	(0.055)	(0.051)	(0.057)	(0.060)	(0.052)	(0.048)	(0.052)	(0.016)
90s and above	-0.084	-0.131*	0.003	0.120	0.210***	-0.043	-0.159**	0.032
	(0.074)	(0.071)	(0.090)	(0.079)	(0.068)	(0.062)	(0.070)	(0.020)
(Log) Episode duration	0.006	0.046***	0.056***	0.080***	-0.015	0.034**	-0.003	0.002
	(0.018)	(0.017)	(0.022)	(0.019)	(0.016)	(0.016)	(0.017)	(0.005)
Episode with other	0.221***	0.236***	-0.117***	-0.043	-0.002	-0.067**	0.235***	-0.028***
	(0.038)	(0.034)	(0.042)	(0.038)	(0.032)	(0.031)	(0.033)	(0.011)
Episode at home	0.002	0.154***	-0.173**	-0.075	-0.068	-0.006	0.130***	-0.012
	(0.044)	(0.049)	(0.073)	(0.058)	(0.050)	(0.041)	(0.047)	(0.013)
Episode outdoors	0.143***	0.159***	-0.143*	0.008	-0.177***	0.009	0.189***	-0.048***
	(0.054)	(0.061)	(0.084)	(0.076)	(0.067)	(0.063)	(0.060)	(0.016)
Episode indoors	-0.039	0.073	-0.137**	-0.076	-0.120**	0.025	0.078	-0.009
	(0.049)	(0.051)	(0.066)	(0.055)	(0.051)	(0.046)	(0.049)	(0.015)
Age	-0.002	0.024***	0.028***	0.021***	-0.007	0.035***	-0.003	0.001
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.002)
Age squared/100	0.007	-0.017***	-0.028***	-0.025***	0.001	-0.031***	0.009	-0.002
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.002)
Native citizen	-0.081*	-0.113***	-0.105**	0.007	0.012	0.067	-0.085*	0.038***
	(0.042)	(0.042)	(0.047)	(0.047)	(0.044)	(0.042)	(0.044)	(0.012)
Secondary education	-0.123**	-0.005	-0.137*	-0.050	-0.011	-0.054	-0.007	0.022
	(0.057)	(0.058)	(0.071)	(0.065)	(0.061)	(0.059)	(0.063)	(0.016)
University education	-0.186***	-0.021	-0.045	0.112*	0.106*	-0.080	-0.107*	0.036**
	(0.053)	(0.052)	(0.073)	(0.063)	(0.058)	(0.056)	(0.057)	(0.015)
Employed	0.122***	0.049	-0.145***	-0.075*	0.113***	-0.220***	0.121***	-0.005
	(0.047)	(0.042)	(0.051)	(0.044)	(0.042)	(0.042)	(0.043)	(0.012)
Married or cohabiting	0.090**	0.040	-0.010	0.011	0.023	0.035	0.041	-0.009
	(0.039)	(0.039)	(0.041)	(0.045)	(0.040)	(0.041)	(0.041)	(0.012)
Number of household members	0.027	0.023	0.026	-0.005	0.011	0.014	0.013	0.002
	(0.018)	(0.019)	(0.021)	(0.020)	(0.019)	(0.019)	(0.017)	(0.006)
Number of children	-0.001	0.006	-0.059**	0.008	-0.026	-0.022	0.020	-0.007
	(0.024)	(0.024)	(0.026)	(0.025)	(0.024)	(0.023)	(0.023)	(0.007)
Medium family income	-0.031	-0.090*	-0.115**	-0.127**	-0.056	-0.188***	0.035	-0.016
	(0.051)	(0.050)	(0.056)	(0.055)	(0.047)	(0.048)	(0.051)	(0.014)
High family income	-0.062	-0.150***	-0.173***	-0.042	0.009	-0.236***	-0.020	-0.012
	(0.050)	(0.051)	(0.054)	(0.058)	(0.050)	(0.051)	(0.053)	(0.015)
Health status	0.276***	0.138***	-0.361***	-0.331***	-0.352***	-0.674***	0.493***	-0.129***
	(0.050)	(0.049)	(0.056)	(0.053)	(0.046)	(0.056)	(0.054)	(0.018)
Weekend day	0.112***	-0.013	-0.089**	-0.158***	-0.143***	-0.057*	0.125***	-0.019**
	(0.034)	(0.031)	(0.037)	(0.034)	(0.033)	(0.030)	(0.031)	(0.010)
Holiday	-0.009	-0.174*	0.183	-0.039	0.219*	-0.017	-0.152*	0.014
	(0.091)	(0.105)	(0.154)	(0.115)	(0.126)	(0.106)	(0.092)	(0.030)

Constant	-0.916***	-1.658***	-0.272	-0.782***	0.651***	-0.409**	-1.012***	0.107*
	(0.186)	(0.187)	(0.197)	(0.200)	(0.201)	(0.183)	(0.197)	(0.061)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	30,861	30,861	30,861	30,861	30,861	30,861	30,861	30,861
Number of individuals	7,879	7,879	7,879	7,879	7,879	7,879	7,879	7,879
R-squared	0.118	0.137	0.073	0.169	0.062	0.140	0.152	0.071

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3. Relationship between maximum temperature and instant feelings, females

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s	0.009	-0.075	0.125	0.103	-0.025	0.082	-0.082	0.031
	(0.071)	(0.065)	(0.076)	(0.075)	(0.072)	(0.076)	(0.073)	(0.025)
50s	0.043	0.004	0.060	0.018	-0.004	0.086	-0.012	0.011
	(0.059)	(0.058)	(0.059)	(0.064)	(0.063)	(0.058)	(0.064)	(0.022)
60s	-0.004	0.057	0.024	0.053	-0.001	0.018	0.005	0.008
	(0.052)	(0.045)	(0.055)	(0.056)	(0.053)	(0.054)	(0.057)	(0.019)
80s	0.017	0.041	-0.015	-0.021	0.024	-0.012	0.028	0.012
	(0.048)	(0.046)	(0.049)	(0.050)	(0.053)	(0.053)	(0.054)	(0.018)
90s and above	0.069	0.100*	-0.034	-0.045	0.041	-0.013	0.078	-0.001
	(0.064)	(0.056)	(0.061)	(0.072)	(0.064)	(0.074)	(0.066)	(0.022)
(Log) Episode duration	0.021	0.071***	0.026*	0.045***	-0.016	0.037**	0.022	0.002
	(0.017)	(0.016)	(0.015)	(0.017)	(0.018)	(0.017)	(0.018)	(0.006)
Episode with other	0.211***	0.217***	-0.076**	-0.042	0.026	0.015	0.188***	-0.033***
	(0.032)	(0.030)	(0.033)	(0.031)	(0.032)	(0.031)	(0.031)	(0.011)
Episode at home	-0.029	0.244***	-0.044	-0.034	-0.007	0.000	0.114***	-0.038**
	(0.046)	(0.043)	(0.040)	(0.045)	(0.044)	(0.050)	(0.044)	(0.015)
Episode outdoors	-0.058	0.285***	0.047	0.064	-0.061	0.083	0.083	-0.057***
	(0.081)	(0.061)	(0.063)	(0.077)	(0.068)	(0.084)	(0.075)	(0.020)
Episode indoors	0.022	0.158***	-0.070	-0.014	-0.131***	-0.011	0.127***	-0.024
	(0.048)	(0.045)	(0.043)	(0.048)	(0.050)	(0.050)	(0.047)	(0.016)
Age	0.004	0.033***	0.017***	0.016***	0.002	0.032***	0.004	-0.003
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.002)
Age squared/100	0.001	-0.025***	-0.015***	-0.022***	-0.009	-0.027***	0.004	0.001
	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.002)
Native citizen	-0.112***	-0.088**	-0.124***	0.038	0.057	0.031	-0.089**	0.038***
	(0.041)	(0.035)	(0.044)	(0.042)	(0.046)	(0.041)	(0.043)	(0.013)
Secondary education	0.043	0.025	-0.068	-0.068	-0.093	-0.112*	0.097	-0.037**
	(0.057)	(0.052)	(0.057)	(0.061)	(0.063)	(0.061)	(0.060)	(0.017)
University education	-0.037	-0.009	-0.127**	0.027	-0.049	-0.153***	0.039	-0.007
	(0.053)	(0.047)	(0.051)	(0.056)	(0.059)	(0.055)	(0.055)	(0.018)
Employed	0.016	-0.023	0.011	-0.080**	0.128***	-0.080**	-0.004	0.010
	(0.034)	(0.032)	(0.032)	(0.035)	(0.037)	(0.036)	(0.035)	(0.011)
Married or cohabiting	0.067**	-0.034	-0.072*	-0.055	-0.021	-0.057	0.049	-0.004
	(0.033)	(0.030)	(0.038)	(0.037)	(0.034)	(0.039)	(0.034)	(0.013)
Number of household members	0.048***	0.035**	-0.017	-0.026	-0.020	0.006	0.046***	-0.010**
	(0.018)	(0.016)	(0.017)	(0.019)	(0.018)	(0.017)	(0.017)	(0.005)
Number of children	0.001	0.029	-0.039*	0.010	0.034	-0.040	0.017	-0.003
	(0.023)	(0.021)	(0.021)	(0.024)	(0.026)	(0.026)	(0.023)	(0.007)
Medium family income	-0.070	-0.100***	-0.059	0.025	0.040	-0.117**	-0.053	0.011
	(0.043)	(0.038)	(0.044)	(0.048)	(0.047)	(0.049)	(0.047)	(0.015)
High family income	-0.155***	-0.223***	-0.095*	0.014	0.021	-0.201***	-0.110**	0.025
	(0.049)	(0.044)	(0.048)	(0.052)	(0.051)	(0.055)	(0.053)	(0.018)
Health status	0.278***	0.058	-0.472***	-0.444***	-0.524***	-0.824***	0.586***	-0.131***
	(0.040)	(0.036)	(0.051)	(0.045)	(0.044)	(0.052)	(0.045)	(0.016)
Weekend day	0.023	-0.035	-0.021	-0.095***	-0.073**	-0.075**	0.048	-0.013
	(0.030)	(0.028)	(0.031)	(0.032)	(0.034)	(0.032)	(0.033)	(0.010)
Holiday	0.198***	0.212***	0.109	-0.147*	-0.102	-0.014	0.209***	-0.051***
	(0.076)	(0.069)	(0.104)	(0.079)	(0.089)	(0.093)	(0.079)	(0.019)
Constant	-0.223	-1.959***	0.496	-0.303	0.191	0.018	-1.022***	0.169**

	(0.329)	(0.636)	(0.429)	(0.244)	(0.366)	(0.403)	(0.359)	(0.066)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	38,306	38,306	38,306	38,306	38,306	38,306	38,306	38,306
Number of individuals	9,620	9,620	9,620	9,620	9,620	9,620	9,620	9,620
R-squared	0.114	0.145	0.088	0.165	0.084	0.179	0.163	0.086

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. Sleep time and quality

	(Log) Sleeping time			Well-rested		
	Pooled	Males	Females	Pooled	Males	Females
	(1)	(2)	(3)	(4)	(5)	(6)
Under 50s	0.009	0.000	0.016**	-0.039	-0.072	-0.012
	(0.005)	(0.008)	(0.006)	(0.031)	(0.053)	(0.040)
50s	0.006	0.006	0.006	-0.004	0.001	-0.013
	(0.004)	(0.007)	(0.006)	(0.028)	(0.041)	(0.040)
60s	0.008**	0.020***	-0.004	-0.045	-0.036	-0.055
	(0.003)	(0.005)	(0.004)	(0.030)	(0.039)	(0.034)
80s	0.001	0.010**	-0.008*	-0.067**	-0.075**	-0.058
	(0.004)	(0.005)	(0.005)	(0.027)	(0.033)	(0.039)
90s and above	-0.005	0.002	-0.011	-0.072**	-0.050	-0.083
	(0.004)	(0.007)	(0.008)	(0.033)	(0.056)	(0.053)
Male	-0.010***	-	-	0.079***	-	-
	(0.004)			(0.017)		
Age	-0.006***	-0.006***	-0.005***	-0.007**	-0.011***	-0.003
	(0.000)	(0.001)	(0.001)	(0.003)	(0.003)	(0.004)
Age squared/100	0.005***	0.006***	0.003***	0.013***	0.016***	0.009**
	(0.000)	(0.001)	(0.001)	(0.003)	(0.004)	(0.004)
Native citizen	-0.030***	-0.037***	-0.026***	-0.100***	-0.093***	-0.106***
	(0.003)	(0.006)	(0.004)	(0.018)	(0.023)	(0.029)
Secondary education	-0.018***	-0.013**	-0.021***	0.026	0.014	0.039
	(0.004)	(0.006)	(0.005)	(0.034)	(0.037)	(0.047)
University education	-0.041***	-0.037***	-0.045***	-0.063**	-0.078**	-0.052
	(0.005)	(0.007)	(0.006)	(0.028)	(0.033)	(0.038)
Employed	-0.069***	-0.081***	-0.059***	-0.051**	-0.057	-0.048**
	(0.003)	(0.006)	(0.004)	(0.022)	(0.038)	(0.023)
Married or cohabiting	-0.009***	-0.022***	-0.001	-0.030	-0.015	-0.041
	(0.003)	(0.004)	(0.002)	(0.023)	(0.030)	(0.029)
Number of household members	0.008***	0.007***	0.008***	0.035***	0.018*	0.054***
	(0.002)	(0.002)	(0.002)	(0.009)	(0.010)	(0.016)
Number of children	-0.017***	-0.011***	-0.020***	-0.051***	-0.030**	-0.071**
	(0.002)	(0.003)	(0.003)	(0.016)	(0.011)	(0.028)
Medium family income	-0.020***	-0.017**	-0.024***	0.025	0.075***	-0.025
	(0.005)	(0.008)	(0.004)	(0.024)	(0.027)	(0.040)
High family income	-0.034***	-0.030***	-0.038***	0.002	0.013	-0.008
	(0.007)	(0.011)	(0.006)	(0.030)	(0.037)	(0.041)
Health status	-	-	-	0.519***	0.481***	0.557***
				(0.021)	(0.036)	(0.035)
Weekend day	0.102***	0.107***	0.097***	0.117***	0.124***	0.108***
	(0.002)	(0.004)	(0.003)	(0.011)	(0.018)	(0.021)
Holiday	0.107***	0.115***	0.100***	-0.025	-0.067	0.005
	(0.010)	(0.011)	(0.013)	(0.057)	(0.087)	(0.078)
Constant	3.471	-10.710	16.472	2.772***	2.878***	2.888***
	(13.030)	(26.346)	(19.945)	(0.056)	(0.119)	(0.086)
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Number of individuals/observations	86,153	38,047	48,106	17,499	7,879	9,620

R-squared	0.084	0.097	0.077	0.075	0.074	0.084

Notes: Clustered standard errors at the state level are given in parentheses. Data come from the 2003-2019 and 2021 ATUS in Columns (1-3), and from the 2010, 2012, 2013 and 2021 ATUS WB-Module in Columns (4-6). Estimation method for specifications is OLS. Omitted category is maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the individual level. All models control for month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

APPENDIX A. VARIABLES DESCRIPTION

Table A1. Description of socio-demographics set from ATUS WB-Module

Variable name	Definition and measurements
1) Male	Coded from gender, 1 if male. Value 0 otherwise
2) Age	Coded from age, measured in years
3) Native citizen	Coded from citizen, 1 if citizen equal to "Native, born in United States". Value 0 otherwise
4) Primary education	Coded from educ, 1 if educ equal to "Less than 1st grade", "1st, 2nd, 3rd, or 4th grade", "5th or 6th grade", "7th or 8th grade", "9th grade", "10th grade", "11th grade", "12th grade, no diploma". Value 0 otherwise
5) Secondary education	Coded from educ, 1 if educ equal to "High school graduate – GED", "High school graduate – diploma". Value 0 otherwise
6) University education	Coded from educ, 1 if educ equal to "Some college but no degree", "Associate degree – occupational vocational", "Associate degree – academic program", "Bachelor's degree (BA, AB, BS, etc.)", "Master's degree (MA, MS, Meng, Med, MSW, etc.)", "Professional school degree (MD, DDS, DVM, etc.)", "Doctoral degree (PhD, EdD, etc.)". Value 0 otherwise
7) Employed	Coded from empstat, 1 if empstat equal to "Employed – at work", "Employed – absent". Value 0 otherwise
8) Married or cohabiting	Coded from marst, 1 if marst equal to "Married – spouse present", "Married – spouse absent". Value 0 otherwise
9) Number of household members	Coded from hhsize: Number of people living in the family
10) Number of children	Coded from hh_numkids: Number of children under 18 in household
11) Low family income	Coded from famincome, 1 if famincome equal to "Less than $24,999". Value 0 otherwise
12) Medium family income	Coded from famincome, 1 if famincome equal to "From $25,000 to $74,999". Value 0 otherwise
13) High family income	Coded from famincome, 1 if famincome equal to "$75,000 and over". Value 0 otherwise
14) Health status	Coded from genhealth, 1 if genhealth equal to "Excellent", "Very good", "Good". Value 0 otherwise
15) Episode with other	Coded from relatew, 1 if relatew equal to "Spouse", "Unmarried partner", "Own household child", "Grandchild", "Parent", "Brother sister", "Other related person", "Foster child", "Housemate, roommate", "Roomer, boarder", "Other nonrelative", "Own non-household child under 18", "Parents (not living in household)", "Other non-household family members under 18", "Other non-household family members 18 and older (including parents-in-law)", "Friends", "Co-workers, colleagues, clients (non-work activities only)", "Neighbors, acquaintances", "Other non-household children under 18", "Other non-household adults 18 and older", "Boss or manager (work activities only, 2010+)", "People whom I supervise (work activities only, 2010+)", "Co-workers (work activities only, 2010+", "Customers (work activities only, 2010+)". Value 0 otherwise
16) Episode at home	Coded from where, 1 if where equal to "Respondent's home or yard", "Someone else's home". Value 0 otherwise
17) Episode outdoors	Coded from where, 1 if where equal to "Outdoors away from home", "Other place", "Unspecified place". Value 0 otherwise
18) Episode indoors	Coded from where, 1 if where equal to "Respondent's workplace", "Restaurant or bar", "Place of worship", "Grocery store", "Other store, mall", "School", "Library", "Bank (2004+)", "Gym/health club (2004+)", "Post office (2004+)". Value 0 otherwise
19) Episode travelling	Coded from where, 1 if where equal to "Car, truck or motorcycle (driver)", "Car, truck or motorcycle (passenger)", "Walking", "Bus", "Subway, train", "Bicycle", "Boat, ferry", "Taxi, limousine service, "Airplane", "Other mode of transportation", "Unspecified mode of transportation". Value 0 otherwise
20) Weekend day	Coded from day, 1 if day equal to "Saturday", "Sunday". Value 0 otherwise

21) Holiday	Coded from holiday, 1 if holiday equal to yes. Value 0 otherwise

Source: Author's own elaboration

Table A2. Classification of time use categories, ATUS WB-Module 2010, 2012, 2013, 2021

Time use categories	Time use activity codes
Personal care	Health-related self care; Self care, n.e.c.; Using health and care services outside the home; Using in-home health and care services; Waiting associated with medical services; Using medical services, n.e.c.; Using personal care services; Waiting associated with personal care services; Eating and drinking; Waiting associated with eating and drinking; Providing care; Telephone calls to or from professional or personal care services providers; Travel related to personal care; Travel related to using personal care services; Travel related to using professional and personal care services, n.e.c.; Travel related to eating and drinking
Cooking	Food and drink preparation
Shopping	Grocery shopping; Purchasing gas; Purchasing food (not groceries); Shopping, except groceries, food, and gas; Waiting associated with shopping; Comparison shopping; Travel related to grocery shopping; Travel related to purchasing food (not groceries) (2005+); Travel related to shopping, ex groceries, food, and gas (2005+); Travel related to purchasing gas (2004+)
Other housework	Interior cleaning; Laundry; Sewing, repairing, and maintaining textiles; Storing interior household items, including food; Housework, n.e.c.; Food presentation; Kitchen and food clean-up; Interior arrangement, decoration, and repairs; Building and repairing furniture; Heating and cooling; Interior maintenance, repair, and decoration, n.e.c.; Exterior cleaning; Exterior repair, improvements, and decoration; Lawn, garden, and houseplant care; Ponds, pools, and hot tubs; Care for animals and pets (not veterinary care); Pet and animal care, n.e.c.; Vehicle repair and maintenance (by self); Appliance, tool, and toy set-up, repair, and maintenance (by self); Appliances and tools, n.e.c.; Financial management; Household and personal organization and planning; Household and personal mail and messages; Home security; Household management, n.e.c.; Household activities, n.e.c.; Physical care for household adults; Looking after household adult; Providing medical care to household adult; Obtaining medical and care services for household adult; Waiting associated with caring for household adults; Caring for household adults, n.e.c.; Helping household adults; Picking up/dropping off household adult; Waiting associated with helping household adults; Helping household adults, n.e.c.; Caring for and helping household members, n.e.c.; Helping household adults, n.e.c.; Caring for and helping household members, n.e.c.; Homework (nonhh children); Physical care for non-household adults; Looking after non household adult; Providing medical care to non-household adult; Obtaining medical and care services for non-household adult; Waiting associated with caring for non-household adults; Caring for non-household adults, n.e.c.; Housework, cooking, and shopping assistance, n.e.c.; House and lawn maintenance and repair assistance for non-household adults; Animal and pet care assistance for non-household adults; Vehicle and appliance maintenance or repair assistance for non-household adults; Financial management assistance for non-household adults; Household management and paperwork assistance for non-household adults; Picking up or dropping off non-household adult; Waiting associated with helping non-household adults; Helping non-household adults, n.e.c.; Banking; Using other financial services; Waiting associated with banking or financial services; Using legal services; Activities related to purchasing or selling real estate; Using veterinary services; Waiting associated with veterinary services; Professional and personal services, n.e.c.; Using interior cleaning

	services; Using clothing repair and cleaning services; Using home maintenance, repair, decoration, or construction services; Waiting associated with home maintenance, repair, decoration, or construction; Using pet services; Waiting associated with pet services; Using lawn and garden services; Using vehicle maintenance or repair services; Using vehicle maintenance and repair services, n.e.c.; Using police and fire services; Using social services; Obtaining licenses and paying fines, fees, or taxes; Using government services, n.e.c.; Security procedures related to government services or civic obligations; Telephone calls to or from salespeople; Telephone calls to or from household services providers; Telephone calls to or from government officials; Travel related to housework; Travel related to food and drink preparation, clean-up, and presentation; Travel related to interior maintenance, repair, and decoration; Travel related to exterior maintenance, repair, and decoration; Travel related to lawn, garden, and houseplant care; Travel related to care for animals and pets; Travel related to vehicle care and maintenance; Travel related to appliance, tool, and toy set-up, repair, and maintenance; Travel related to household management; Travel related to caring for household adults; Travel related to helping household adults; Travel related to caring for and helping non-household children; Travel related to caring for non-household adults; Travel related to helping non-household adults; Travel related to using financial services and banking; Travel related to using legal services; Travel related to using medical services; Travel related to using personal care services; Travel related to using real estate services; Travel related to using veterinary services; Travel related to using household services; Travel related to using home maintenance, repair, decoration, or construction services; Travel related to using pet services (not veterinary care); Travel related to using lawn and garden services; Travel related to using vehicle maintenance and repair services; Travel related to using government services; Travel related to civic obligations and participation
Childcare	Physical care for household children; Reading to/with household children; Playing with household children, not sports; Arts and crafts with household children; Playing sports with household children; Talking with/listening to household children; Organization and planning for household children; Looking after household children; Attending household children's events; Waiting for/with household children; Picking up/dropping off household children; Caring for and helping household children, n.e.c.; Homework (household children); Meetings and school conferences (household children); Home schooling of household children; Activities related to household child's education; Providing medical care to household children; Obtaining medical care for household children; Waiting associated with household children's education; Physical care for non-household children; Reading to/with non-household children; Playing with non-household children, not sports; Arts and crafts with non-household children; Playing sports with non-household children; Talking with/listening to non-household children; Organization and planning for non-household children; Looking after non-household children; Attending non-household children's events; Waiting for/with non-household children; Dropping off/picking up non-household children; Caring for and helping non-household children; Home schooling of non-household children; Waiting associated with non-household children's education; Using paid childcare services; Travel related to caring for and helping household children; Travel related to household children's education; Travel related to household children's health; Travel related to non-household children's education; Travel related to non-household children's health; Travel related to using childcare services

Market work	Work, main job; Work, other job(s); Waiting associated with working; Working, n.e.c.; Socializing, relaxing, and leisure as part of job; Eating and drinking as part of job; Work-related activities, n.e.c.; Income-generating hobbies, crafts, and food; Income-generating services; Income-generating rental property activities; Other income-generating activities, n.e.c.; Jobs earch activities; Job interviewing; Job search and interviewing, n.e.c.; Taking class for degree, certification or licensure; Taking class for personal interest; Waiting associated with taking classes; Extracurricular club activities; Extracurricular music and performance activities; Education-related extracurricular activities; Research/homework for class for degree, certification, or licensure; Research/homework for class for personal interest; Research/homework, n.e.c.; Administrative activities: class for degree, certification or licensure; Waiting associated with administrative activities; Administrative for education, n.e.c.; Education, n.e.c.; Teaching, leading, counselling, mentoring; Telephone calls to/from education services; Travel related to working; Travel related to work-related activities; Travel related to income-generating activities; Travel related to job search and interviewing; Travel related to taking class; Travel related to extracurricular activities; Travel related to research/homework; Travel related to registration/administrative activities; Education travel, n.e.c.
Outdoor leisure	Walking, exercising, playing with animals; Attending performing arts; Attending museums; Attending movies/film; Attending gambling establishments; Watching boating; Watching softball; Watching vehicle touring/racing; Fundraising; Building houses, wildlife sites, and other structures; Attending meetings, conferences, and training; Travel related to relaxing and leisure; Security procedures related to traveling; Traveling, n.e.c.
Indoor leisure	Relaxing, thinking; Tobacco and drug use; Playing games; Computer use for leisure; Relaxing and leisure, n.e.c.; Watching baseball; Computer use; Organizing and preparing; Administrative and support activities, n.e.c.; Food preparation, presentation, clean-up; Collecting and delivering clothing and other goods; Performing
Entertainment	Television and movies; Television; Listening to the radio; Listening To/playing music
Religious	Attending religious services; Participation in religious practices; Waiting associated with religious and spiritual practices; Religious education activities; Religious and spiritual activities, n.e.c.; Social services and care activities, n.e.c.; Serving at volunteer events and cultural activities; Security procedures related to volunteer activities; Volunteer activities, n.e.c.; Travel related to religious/spiritual practices: Travel related to volunteering; Travel related to volunteer activities, n.e.c.
Hobbies	Arts and crafts as a hobby; Collecting as a hobby; Hobbies, except arts and crafts and collecting; Arts and entertainment, n.e.c.; Waiting associated with arts and entertainment; Travel related to arts and entertainment; Travel as a form of entertainment
Reading	Reading for personal interest; Writing for personal interest; Reading; Writing
Socializing	Civic obligations and participation; Waiting associated with using government services; Socializing and communicating with others; Attending or hosting parties/receptions/ceremonies; Attending meetings for personal interest; Attending/hosting social events, n.e.c.; Relaxing, thinking; Relaxing and leisure, n.e.c.; Waiting associated with socializing and communicating;

	Waiting associated with relaxing/leisure; Socializing, relaxing and leisure, n.e.c.; Watching baseball; Watching basketball; Watching dancing; Watching equestrian sports; Watching football; Watching hockey; Watching racquet sports; Watching soccer; Watching water sports; Telephone calls (except hotline counselling); Administrative and support activities, n.e.c.; Food preparation, presentation, clean-up; Collecting and delivering clothing and other goods; Indoor and outdoor maintenance, repair, and clean-up; Indoor and outdoor maintenance, building, and clean-up activities, n.e.c.; Performing; Public health services; Telephone calls to/from family members; Phone calls to/from friends, neighbors, or acquaintances; Telephone calls (to or from), n.e.c.; Waiting associated with telephone calls; Travel related to socializing and communicating; Travel related to attending or hosting social events; Travel related to socializing, relaxing, leisure, n.e.c.; Travel related to phone calls
Sports	Doing aerobics; Playing baseball; Playing basketball; Biking; Playing billiards; Boating; Bowling; Climbing, spelunking, caving; Dancing; Participating in equestrian sports; Fishing; Playing football; Golfing; Hiking; Playing hockey; Hunting; Participating in martial arts; Playing racquet sports; Rollerblading; Running; Skiing, ice skating, snowboarding; Playing soccer; Playing softball; Using cardiovascular equipment; Vehicle touring/racing; Playing volleyball; Walking; Participating in water sports; Weightlifting/strength training; Working out, unspecified; Doing yoga; Playing sports, n.e.c.; Attending sporting events, n.e.c.; Waiting related to playing sports or exercising; Waiting related to attending sporting events; Travel related to participating in sports/exercise/recreation; Travel related to attending sporting or recreational events

Source: Author's own elaboration

APPENDIX B. ROBUSTNESS CHECKS

Table B1. Regression results, relationship between daily weather conditions and instant feelings, males

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s	-0.047	-0.050	0.122	0.117	0.011	0.085	-0.101	0.010
	(0.069)	(0.070)	(0.078)	(0.077)	(0.076)	(0.072)	(0.071)	(0.022)
50s	0.069	-0.124*	0.082	0.036	0.025	0.036	-0.063	0.012
	(0.069)	(0.069)	(0.072)	(0.073)	(0.068)	(0.061)	(0.065)	(0.018)
60s	-0.080	-0.036	0.001	0.012	0.057	0.027	-0.068	0.009
	(0.061)	(0.051)	(0.058)	(0.058)	(0.054)	(0.050)	(0.055)	(0.016)
80s	-0.122**	-0.126**	0.015	0.122**	0.176***	0.044	-0.181***	0.059***
	(0.056)	(0.052)	(0.057)	(0.061)	(0.053)	(0.049)	(0.053)	(0.016)
90s and above	-0.081	-0.118	0.001	0.113	0.206***	-0.038	-0.150**	0.027
	(0.075)	(0.072)	(0.092)	(0.081)	(0.071)	(0.064)	(0.073)	(0.021)
Change maximum temperature	-0.003	-0.003	0.003	0.003	0.004	0.004	-0.005**	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)
(Log) Episode duration	0.009	0.048***	0.054**	0.079***	-0.019	0.029*	0.001	0.002
	(0.018)	(0.017)	(0.021)	(0.019)	(0.017)	(0.016)	(0.017)	(0.005)
Episode with other	0.214***	0.226***	-0.114***	-0.039	-0.000	-0.069**	0.226***	-0.026**
	(0.039)	(0.035)	(0.042)	(0.039)	(0.033)	(0.031)	(0.033)	(0.011)
Episode at home	-0.003	0.166***	-0.164**	-0.066	-0.061	0.008	0.126***	-0.013
	(0.044)	(0.050)	(0.073)	(0.058)	(0.050)	(0.041)	(0.048)	(0.013)
Episode outdoors	0.136**	0.158***	-0.131	0.005	-0.176***	0.021	0.182***	-0.047***
	(0.055)	(0.061)	(0.084)	(0.075)	(0.067)	(0.063)	(0.060)	(0.016)
Episode indoors	-0.053	0.078	-0.127*	-0.067	-0.103**	0.044	0.064	-0.009
	(0.049)	(0.052)	(0.066)	(0.055)	(0.052)	(0.045)	(0.049)	(0.015)
0 < prec. < 0.1	-0.062	-0.108	0.085	0.211**	0.087	0.040	-0.156**	-0.022
	(0.075)	(0.077)	(0.079)	(0.088)	(0.086)	(0.078)	(0.069)	(0.022)
0.1 < prec. < 0.5	-0.007	-0.050	0.099	0.123*	0.065	-0.083	-0.066	0.007
	(0.059)	(0.066)	(0.067)	(0.066)	(0.060)	(0.059)	(0.062)	(0.022)
0.5 < prec. <1	-0.034	-0.018	-0.098	-0.116	-0.064	-0.069	0.043	-0.055***
	(0.093)	(0.094)	(0.062)	(0.090)	(0.077)	(0.078)	(0.070)	(0.020)
1 ≤ prec.	-0.032	0.003	0.062	0.012	0.004	0.008	-0.025	-0.004
	(0.044)	(0.039)	(0.047)	(0.045)	(0.038)	(0.039)	(0.039)	(0.013)
Change precipitation	0.000	0.000	0.001	0.001	0.001**	0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
0 < snow. < 0.1	-0.053	0.333*	0.051	0.274	-0.032	0.047	0.073	-0.054*
	(0.149)	(0.180)	(0.211)	(0.290)	(0.305)	(0.269)	(0.208)	(0.032)
0.1 < snow. < 0.5	-0.163	0.145	0.281	0.011	0.225	0.282	-0.142	0.015
	(0.148)	(0.162)	(0.250)	(0.152)	(0.152)	(0.217)	(0.165)	(0.043)
0.5 < snow. <1	0.200	-0.043	-0.272*	-0.080	-0.093	-0.233	0.177	-0.006
	(0.197)	(0.129)	(0.161)	(0.203)	(0.136)	(0.164)	(0.166)	(0.094)
1 ≤ snow.	-0.004	-0.013	0.035	-0.054	-0.053	-0.101	0.029	0.037
	(0.108)	(0.106)	(0.107)	(0.116)	(0.106)	(0.092)	(0.111)	(0.035)
Change snowfall	0.004	0.002	-0.004	-0.003	0.002	-0.001	0.003	-0.001
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)
Age	-0.002	0.023***	0.027***	0.021***	-0.009	0.035***	-0.002	0.001
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.002)
Age squared/100	0.006	-0.017***	-0.027***	-0.026***	0.003	-0.031***	0.008	-0.002
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.002)
Native citizen	-0.086**	-0.112***	-0.101**	0.015	0.017	0.075*	-0.091**	0.038***

	(0.043)	(0.042)	(0.047)	(0.047)	(0.045)	(0.042)	(0.044)	(0.012)
Secondary education	-0.138**	-0.013	-0.129*	-0.041	-0.004	-0.059	-0.021	0.024
	(0.058)	(0.058)	(0.072)	(0.066)	(0.062)	(0.059)	(0.063)	(0.016)
University education	-0.199***	-0.026	-0.040	0.111*	0.112*	-0.077	-0.117**	0.037**
	(0.054)	(0.053)	(0.073)	(0.064)	(0.059)	(0.056)	(0.057)	(0.015)
Employed	0.117**	0.054	-0.134***	-0.062	0.125***	-0.210***	0.112***	-0.003
	(0.047)	(0.043)	(0.050)	(0.045)	(0.042)	(0.042)	(0.043)	(0.012)
Married or cohabiting	0.097**	0.047	-0.020	0.004	0.024	0.032	0.050	-0.010
	(0.040)	(0.040)	(0.041)	(0.045)	(0.040)	(0.042)	(0.041)	(0.013)
Number of household members	0.022	0.019	0.027	-0.006	0.013	0.015	0.009	0.003
	(0.018)	(0.019)	(0.021)	(0.020)	(0.019)	(0.019)	(0.018)	(0.006)
Number of children	0.003	0.011	-0.061**	0.009	-0.029	-0.023	0.024	-0.009
	(0.024)	(0.024)	(0.026)	(0.025)	(0.025)	(0.023)	(0.023)	(0.007)
Medium family income	-0.027	-0.093*	-0.117**	-0.136**	-0.064	-0.192***	0.040	-0.014
	(0.051)	(0.051)	(0.056)	(0.056)	(0.049)	(0.049)	(0.052)	(0.014)
High family income	-0.054	-0.152***	-0.172***	-0.054	-0.006	-0.235***	-0.012	-0.013
	(0.051)	(0.052)	(0.055)	(0.058)	(0.051)	(0.051)	(0.054)	(0.015)
Health status	0.275***	0.133***	-0.368***	-0.338***	-0.344***	-0.675***	0.492***	-0.130***
	(0.051)	(0.050)	(0.057)	(0.054)	(0.047)	(0.058)	(0.055)	(0.018)
Weekend day	0.111***	-0.012	-0.089**	-0.162***	-0.147***	-0.055*	0.126***	-0.020**
	(0.034)	(0.031)	(0.037)	(0.034)	(0.033)	(0.031)	(0.031)	(0.010)
Holiday	-0.009	-0.183*	0.175	-0.039	0.211*	-0.013	-0.154*	0.013
	(0.092)	(0.105)	(0.153)	(0.117)	(0.124)	(0.107)	(0.091)	(0.029)
Constant	-0.880***	-1.583***	-0.372*	-0.930***	0.578***	-0.337*	-0.915***	0.092
	(0.196)	(0.201)	(0.210)	(0.208)	(0.207)	(0.191)	(0.203)	(0.063)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	30,031	30,031	30,031	30,031	30,031	30,031	30,031	30,031
Number of individuals	7,651	7,651	7,651	7,651	7,651	7,651	7,651	7,651
R-squared	0.119	0.140	0.077	0.173	0.065	0.140	0.156	0.073

Notes: Clustered standard errors at the individual level appear in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Omitted categories are no rain, no snowfall, and maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the activity level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B2. Regression results, relationship between daily weather conditions and instant feelings, females

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s	-0.033	-0.104	0.105	0.124	0.017	0.030	-0.112	0.046*
	(0.080)	(0.075)	(0.081)	(0.078)	(0.077)	(0.079)	(0.081)	(0.028)
50s	0.029	-0.007	0.055	0.012	-0.009	0.064	-0.014	0.020
	(0.064)	(0.063)	(0.059)	(0.067)	(0.066)	(0.060)	(0.070)	(0.023)
60s	-0.010	0.046	0.019	0.043	-0.002	0.018	0.002	0.014
	(0.055)	(0.048)	(0.056)	(0.058)	(0.054)	(0.056)	(0.060)	(0.020)
80s	0.028	0.049	0.006	-0.014	0.028	0.008	0.026	0.014
	(0.048)	(0.047)	(0.049)	(0.051)	(0.053)	(0.054)	(0.054)	(0.019)
90s and above	0.085	0.110*	-0.029	-0.035	0.032	0.011	0.083	-0.005
	(0.066)	(0.057)	(0.061)	(0.073)	(0.065)	(0.075)	(0.066)	(0.022)
Change maximum temperature	-0.005*	-0.003	-0.001	0.002	0.006**	-0.007*	-0.004	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.001)
(Log) Episode duration	0.020	0.070***	0.027*	0.047***	-0.012	0.038**	0.020	0.002
	(0.017)	(0.016)	(0.015)	(0.017)	(0.018)	(0.017)	(0.019)	(0.006)
Episode with other	0.209***	0.219***	-0.079**	-0.036	0.027	0.007	0.188***	-0.036***
	(0.032)	(0.030)	(0.033)	(0.032)	(0.032)	(0.031)	(0.032)	(0.012)
Episode at home	-0.024	0.249***	-0.047	-0.036	-0.005	0.005	0.118***	-0.037**
	(0.046)	(0.043)	(0.040)	(0.046)	(0.044)	(0.050)	(0.044)	(0.015)
Episode outdoors	-0.043	0.285***	0.044	0.054	-0.068	0.082	0.093	-0.057***
	(0.082)	(0.062)	(0.064)	(0.078)	(0.069)	(0.084)	(0.075)	(0.020)
Episode indoors	0.031	0.168***	-0.070	-0.021	-0.140***	-0.002	0.136***	-0.025
	(0.049)	(0.046)	(0.043)	(0.049)	(0.051)	(0.050)	(0.048)	(0.017)
0 < prec. < 0.1	-0.073	-0.042	-0.119*	0.023	-0.097	-0.119*	0.015	0.026
	(0.066)	(0.067)	(0.065)	(0.081)	(0.083)	(0.067)	(0.076)	(0.033)
0.1 < prec. < 0.5	0.128**	0.085*	-0.060	-0.001	-0.030	-0.047	0.112**	-0.036**
	(0.052)	(0.051)	(0.053)	(0.056)	(0.062)	(0.057)	(0.056)	(0.017)
0.5 < prec. <1	-0.112	0.032	0.132	0.129	0.165**	0.063	-0.128	0.016
	(0.092)	(0.066)	(0.084)	(0.085)	(0.076)	(0.091)	(0.082)	(0.027)
1 ≤ prec.	0.002	0.032	-0.005	0.058	0.034	-0.011	-0.002	-0.006
	(0.039)	(0.040)	(0.036)	(0.040)	(0.041)	(0.042)	(0.045)	(0.015)
Change precipitation	0.000	-0.000	0.000	0.000	-0.001	-0.001	0.000	-0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
0 < snow. < 0.1	-0.351*	-0.045	0.365	-0.102	-0.220	-0.149	-0.106	0.003
	(0.193)	(0.191)	(0.232)	(0.214)	(0.285)	(0.128)	(0.163)	(0.076)
0.1 < snow. < 0.5	0.297**	0.254*	0.147	0.139	0.187	-0.055	0.137	-0.060
	(0.147)	(0.133)	(0.131)	(0.158)	(0.182)	(0.134)	(0.125)	(0.039)
0.5 < snow. <1	0.238**	0.022	-0.130	-0.165	-0.318	-0.129	0.256*	-0.056
	(0.110)	(0.207)	(0.103)	(0.161)	(0.199)	(0.114)	(0.150)	(0.035)
1 ≤ snow.	-0.006	-0.034	-0.006	-0.151	-0.096	0.064	0.026	0.006
	(0.089)	(0.082)	(0.097)	(0.095)	(0.096)	(0.115)	(0.093)	(0.034)
Change snowfall	0.001	0.002	-0.002	-0.003	-0.000	0.003	0.002	-0.000
	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)
Age	0.004	0.034***	0.016***	0.017***	0.001	0.031***	0.005	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.002)
Age squared/100	0.001	-0.026***	-0.014**	-0.022***	-0.008	-0.026***	0.003	0.001
	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.002)
Native citizen	-0.105**	-0.085**	-0.137***	0.035	0.064	0.040	-0.086**	0.036***
	(0.042)	(0.036)	(0.044)	(0.042)	(0.045)	(0.042)	(0.044)	(0.013)
Secondary education	0.038	0.022	-0.078	-0.080	-0.083	-0.112*	0.095	-0.035**

	(0.057)	(0.053)	(0.058)	(0.062)	(0.064)	(0.060)	(0.061)	(0.018)
University education	-0.049	-0.022	-0.131**	0.019	-0.037	-0.158***	0.029	-0.002
	(0.054)	(0.048)	(0.051)	(0.056)	(0.059)	(0.055)	(0.056)	(0.018)
Employed	0.007	-0.024	0.016	-0.070**	0.131***	-0.081**	-0.011	0.012
	(0.035)	(0.033)	(0.032)	(0.035)	(0.037)	(0.036)	(0.036)	(0.011)
Married or cohabiting	0.069**	-0.034	-0.078**	-0.065*	-0.006	-0.056	0.050	-0.005
	(0.033)	(0.031)	(0.038)	(0.037)	(0.035)	(0.039)	(0.035)	(0.013)
Number of household members	0.048***	0.033**	-0.017	-0.026	-0.027	-0.004	0.048***	-0.010*
	(0.018)	(0.016)	(0.017)	(0.019)	(0.019)	(0.017)	(0.018)	(0.005)
Number of children	-0.000	0.028	-0.038*	0.012	0.042	-0.031	0.012	-0.003
	(0.024)	(0.022)	(0.021)	(0.024)	(0.026)	(0.026)	(0.023)	(0.007)
Medium family income	-0.063	-0.093**	-0.057	0.023	0.043	-0.113**	-0.049	0.010
	(0.043)	(0.039)	(0.044)	(0.048)	(0.048)	(0.050)	(0.048)	(0.015)
High family income	-0.139***	-0.216***	-0.089*	-0.001	0.016	-0.202***	-0.098*	0.022
	(0.049)	(0.045)	(0.048)	(0.052)	(0.051)	(0.056)	(0.053)	(0.018)
Health status	0.263***	0.054	-0.469***	-0.434***	-0.527***	-0.825***	0.578***	-0.132***
	(0.040)	(0.036)	(0.052)	(0.046)	(0.045)	(0.052)	(0.046)	(0.016)
Weekend day	0.028	-0.033	-0.019	-0.098***	-0.071**	-0.073**	0.051	-0.012
	(0.031)	(0.028)	(0.030)	(0.032)	(0.035)	(0.032)	(0.033)	(0.011)
Holiday	0.204***	0.218***	0.125	-0.149*	-0.096	-0.005	0.209***	-0.052***
	(0.077)	(0.069)	(0.105)	(0.080)	(0.090)	(0.093)	(0.081)	(0.020)
Constant	-1.102***	-1.187***	0.216	-0.481**	0.740*	0.418	-1.133***	0.526***
	(0.393)	(0.201)	(0.233)	(0.204)	(0.434)	(0.356)	(0.308)	(0.152)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	37,191	37,191	37,191	37,191	37,191	37,191	37,191	37,191
Number of individuals	9,339	9,339	9,339	9,339	9,339	9,339	9,339	9,339
R-squared	0.115	0.146	0.093	0.167	0.089	0.184	0.164	0.089

Notes: Clustered standard errors at the individual level appear in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Omitted categories are no rain, no snowfall, and maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the activity level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B3. Regression results, relationship between maximum temperature and instant feelings (controlling for life satisfaction), males

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s	0.020	0.041	0.097	-0.010	0.031	-0.005	0.008	0.007
	(0.068)	(0.074)	(0.076)	(0.076)	(0.078)	(0.073)	(0.073)	(0.024)
50s	0.106	-0.099	0.022	0.010	0.104	0.032	-0.040	0.013
	(0.068)	(0.078)	(0.073)	(0.080)	(0.077)	(0.066)	(0.066)	(0.020)
60s	-0.051	-0.024	0.003	0.029	0.129**	0.039	-0.074	0.007
	(0.062)	(0.055)	(0.063)	(0.064)	(0.063)	(0.056)	(0.057)	(0.017)
80s	-0.121**	-0.112*	-0.071	0.094	0.213***	0.025	-0.161***	0.062***
	(0.060)	(0.059)	(0.062)	(0.067)	(0.059)	(0.053)	(0.057)	(0.018)
90s and above	-0.063	-0.158*	-0.096	0.068	0.269***	-0.008	-0.157**	0.039*
	(0.079)	(0.082)	(0.082)	(0.083)	(0.073)	(0.074)	(0.072)	(0.022)
(Log) Episode duration	-0.002	0.053***	0.071***	0.090***	-0.021	0.028	-0.005	0.002
	(0.019)	(0.019)	(0.024)	(0.022)	(0.019)	(0.018)	(0.018)	(0.006)
Episode with other	0.206***	0.249***	-0.129***	-0.045	-0.004	-0.070**	0.238***	-0.029**
	(0.043)	(0.040)	(0.044)	(0.044)	(0.037)	(0.035)	(0.037)	(0.012)
Episode at home	0.029	0.107**	-0.260***	-0.182***	-0.109*	-0.034	0.167***	-0.017
	(0.050)	(0.054)	(0.089)	(0.070)	(0.060)	(0.048)	(0.056)	(0.015)
Episode outdoors	0.141**	0.089	-0.218**	-0.044	-0.186**	0.039	0.174**	-0.042**
	(0.061)	(0.067)	(0.092)	(0.086)	(0.079)	(0.067)	(0.068)	(0.019)
Episode indoors	-0.014	0.020	-0.212***	-0.121*	-0.126**	0.037	0.081	-0.014
	(0.055)	(0.059)	(0.079)	(0.069)	(0.061)	(0.053)	(0.058)	(0.017)
Age	0.007	0.030***	0.020***	0.015**	-0.004	0.031***	0.006	-0.000
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.002)
Age squared/100	-0.006	-0.026***	-0.018***	-0.017**	-0.000	-0.026***	-0.004	-0.000
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.002)
Native citizen	-0.072	-0.093*	-0.058	0.029	0.043	0.104**	-0.097**	0.039***
	(0.046)	(0.048)	(0.048)	(0.052)	(0.050)	(0.047)	(0.048)	(0.014)
Secondary education	-0.074	0.059	-0.150**	-0.096	0.009	-0.109*	0.058	0.013
	(0.063)	(0.066)	(0.066)	(0.067)	(0.069)	(0.066)	(0.070)	(0.018)
University education	-0.154***	0.051	-0.048	0.087	0.121*	-0.115*	-0.053	0.029*
	(0.058)	(0.060)	(0.065)	(0.063)	(0.066)	(0.064)	(0.062)	(0.016)
Employed	0.027	-0.001	-0.089	-0.071	0.105**	-0.191***	0.047	0.016
	(0.051)	(0.048)	(0.054)	(0.050)	(0.048)	(0.049)	(0.048)	(0.014)
Married or cohabiting	0.034	-0.007	-0.009	0.096*	0.042	0.079*	-0.032	-0.002
	(0.044)	(0.046)	(0.045)	(0.051)	(0.047)	(0.047)	(0.045)	(0.014)
Number of household members	0.011	0.024	0.050**	0.021	0.033	0.017	-0.007	0.006
	(0.020)	(0.022)	(0.023)	(0.023)	(0.021)	(0.022)	(0.019)	(0.007)
Number of children	0.005	0.006	-0.068**	-0.004	-0.041	-0.016	0.028	-0.012
	(0.026)	(0.027)	(0.029)	(0.029)	(0.029)	(0.027)	(0.026)	(0.008)
Medium family income	-0.040	-0.103*	-0.064	-0.140**	-0.121**	-0.197***	0.037	-0.015
	(0.055)	(0.058)	(0.062)	(0.063)	(0.057)	(0.055)	(0.056)	(0.016)
High family income	-0.115**	-0.174***	-0.104*	-0.026	-0.012	-0.247***	-0.058	-0.007
	(0.054)	(0.059)	(0.061)	(0.066)	(0.058)	(0.058)	(0.058)	(0.017)
Health status	0.031	0.016	-0.190***	-0.123**	-0.232***	-0.568***	0.228***	-0.087***
	(0.056)	(0.057)	(0.060)	(0.063)	(0.057)	(0.067)	(0.061)	(0.020)
Weekend day	0.110***	-0.031	-0.118***	-0.157***	-0.151***	-0.086**	0.127***	-0.014
	(0.036)	(0.034)	(0.040)	(0.039)	(0.038)	(0.034)	(0.033)	(0.011)
Holiday	-0.034	-0.142	0.178	-0.067	0.201	0.063	-0.150	0.041
	(0.088)	(0.098)	(0.170)	(0.122)	(0.152)	(0.117)	(0.105)	(0.033)

Life satisfaction (*z*-score)	0.299***	0.194***	-0.219***	-0.253***	-0.134***	-0.144***	0.347***	-0.059***
	(0.021)	(0.021)	(0.023)	(0.022)	(0.019)	(0.020)	(0.022)	(0.006)
Constant	0.067	-0.808***	-0.189	-0.697***	0.688*	0.421	-0.420	0.186*
	(0.221)	(0.273)	(0.222)	(0.253)	(0.360)	(0.362)	(0.260)	(0.106)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	21,259	21,259	21,259	21,259	21,259	21,259	21,259	21,259
Number of individuals	5,470	5,470	5,470	5,470	5,470	5,470	5,470	5,470
R-squared	0.206	0.177	0.120	0.226	0.083	0.169	0.266	0.114

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B4. Regression results, relationship between maximum temperature and instant feelings (controlling for life satisfaction), females

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s	0.041	-0.071	0.140	0.021	-0.005	0.148*	-0.071	0.021
	(0.082)	(0.076)	(0.093)	(0.088)	(0.084)	(0.089)	(0.085)	(0.030)
50s	0.115*	0.031	0.046	-0.040	-0.069	0.094	0.056	-0.002
	(0.065)	(0.068)	(0.068)	(0.073)	(0.072)	(0.067)	(0.072)	(0.025)
60s	0.045	0.067	0.001	0.010	-0.015	0.013	0.046	0.003
	(0.061)	(0.052)	(0.064)	(0.065)	(0.061)	(0.062)	(0.065)	(0.022)
80s	0.042	0.062	-0.052	-0.053	0.009	-0.060	0.073	-0.000
	(0.048)	(0.050)	(0.052)	(0.052)	(0.057)	(0.059)	(0.055)	(0.019)
90s and above	0.069	0.148**	-0.067	-0.001	-0.005	-0.050	0.113	-0.007
	(0.066)	(0.062)	(0.069)	(0.080)	(0.073)	(0.085)	(0.071)	(0.024)
(Log) Episode duration	0.004	0.056***	0.020	0.048***	-0.011	0.035*	0.009	0.006
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.020)	(0.019)	(0.007)
Episode with other	0.202***	0.258***	-0.068*	-0.011	0.075**	0.060*	0.174***	-0.033***
	(0.034)	(0.033)	(0.037)	(0.035)	(0.035)	(0.035)	(0.031)	(0.013)
Episode at home	-0.010	0.288***	-0.038	-0.024	-0.043	-0.023	0.151***	-0.047***
	(0.052)	(0.049)	(0.047)	(0.052)	(0.052)	(0.060)	(0.049)	(0.018)
Episode outdoors	0.011	0.269***	0.027	0.009	-0.149*	-0.001	0.153*	-0.072***
	(0.087)	(0.069)	(0.076)	(0.084)	(0.081)	(0.099)	(0.081)	(0.024)
Episode indoors	0.077	0.156***	-0.066	-0.053	-0.129**	-0.026	0.156***	-0.031
	(0.055)	(0.051)	(0.049)	(0.056)	(0.059)	(0.059)	(0.051)	(0.019)
Age	0.011**	0.037***	0.014**	0.009	-0.002	0.028***	0.011*	-0.005**
	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.002)
Age squared/100	-0.008	-0.029***	-0.010	-0.012**	-0.003	-0.022***	-0.007	0.004
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.002)
Native citizen	-0.112**	-0.105***	-0.116**	0.043	0.040	0.012	-0.091*	0.043***
	(0.046)	(0.040)	(0.050)	(0.046)	(0.049)	(0.046)	(0.047)	(0.015)
Secondary education	0.055	0.076	-0.073	-0.039	-0.098	-0.075	0.113*	-0.057***
	(0.062)	(0.057)	(0.066)	(0.070)	(0.069)	(0.070)	(0.065)	(0.020)
University education	0.040	0.079	-0.183***	0.007	-0.073	-0.167***	0.128**	-0.031
	(0.059)	(0.053)	(0.060)	(0.063)	(0.065)	(0.060)	(0.062)	(0.021)
Employed	0.001	-0.029	0.006	-0.096**	0.113***	-0.084**	-0.004	0.012
	(0.036)	(0.036)	(0.037)	(0.040)	(0.042)	(0.040)	(0.039)	(0.013)
Married or cohabiting	0.017	-0.117***	-0.036	-0.026	0.000	-0.046	-0.025	0.015
	(0.035)	(0.034)	(0.044)	(0.040)	(0.039)	(0.044)	(0.037)	(0.014)
Number of household members	0.031*	0.013	-0.001	-0.028	-0.003	0.009	0.023	-0.003
	(0.017)	(0.016)	(0.020)	(0.019)	(0.021)	(0.020)	(0.017)	(0.006)
Number of children	-0.011	0.037*	-0.043*	0.031	0.029	-0.049*	0.015	-0.004
	(0.023)	(0.022)	(0.025)	(0.025)	(0.026)	(0.028)	(0.023)	(0.008)
Medium family income	-0.052	-0.063	-0.074	0.027	-0.028	-0.156***	-0.003	-0.015
	(0.045)	(0.042)	(0.051)	(0.052)	(0.048)	(0.055)	(0.048)	(0.017)
High family income	-0.230***	-0.235***	-0.052	0.083	-0.021	-0.181***	-0.159***	0.013
	(0.049)	(0.050)	(0.057)	(0.055)	(0.052)	(0.061)	(0.053)	(0.020)
Health status	0.097**	-0.025	-0.324***	-0.269***	-0.390***	-0.708***	0.366***	-0.088***
	(0.045)	(0.044)	(0.061)	(0.051)	(0.052)	(0.059)	(0.050)	(0.019)
Weekend day	0.040	-0.034	-0.013	-0.108***	-0.108***	-0.110***	0.072**	-0.020*
	(0.033)	(0.030)	(0.037)	(0.035)	(0.035)	(0.037)	(0.033)	(0.012)
Holiday	0.210***	0.157**	0.038	-0.102	-0.170*	-0.030	0.210**	-0.050**
	(0.076)	(0.076)	(0.093)	(0.095)	(0.099)	(0.096)	(0.086)	(0.025)

Life satisfaction (*z*-score)	0.288***	0.172***	-0.210***	-0.258***	-0.166***	-0.173***	0.346***	-0.069***
	(0.018)	(0.018)	(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.007)
Constant	-1.034***	-1.448***	0.217	0.167	0.918**	0.382	-1.396***	0.705***
	(0.361)	(0.215)	(0.291)	(0.463)	(0.418)	(0.353)	(0.356)	(0.134)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	26,326	26,326	26,326	26,326	26,326	26,326	26,326	26,326
Number of individuals	6,695	6,695	6,695	6,695	6,695	6,695	6,695	6,695
R-squared	0.202	0.190	0.130	0.222	0.116	0.213	0.276	0.133

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B5. Placebo test, maximum temperature from one year before, males

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s (*one year before*)	0.008	-0.052	-0.017	0.049	0.041	0.044	-0.046	0.008
	(0.069)	(0.064)	(0.068)	(0.073)	(0.071)	(0.067)	(0.067)	(0.019)
50s (*one year before*)	0.063	-0.058	-0.033	-0.046	-0.069	-0.017	0.030	0.002
	(0.065)	(0.063)	(0.066)	(0.064)	(0.066)	(0.059)	(0.064)	(0.018)
60s (*one year before*)	-0.068	-0.100*	0.000	0.071	-0.057	-0.013	-0.072	0.013
	(0.063)	(0.053)	(0.064)	(0.062)	(0.055)	(0.048)	(0.055)	(0.017)
80s (*one year before*)	-0.023	-0.042	-0.022	0.027	-0.037	0.038	-0.029	0.010
	(0.059)	(0.053)	(0.065)	(0.062)	(0.056)	(0.050)	(0.056)	(0.017)
90s and above (*one year before*)	-0.065	-0.073	0.023	0.037	-0.020	0.024	-0.070	0.012
	(0.078)	(0.072)	(0.089)	(0.077)	(0.071)	(0.068)	(0.071)	(0.022)
(Log) Episode duration	0.009	0.046***	0.057***	0.080***	-0.016	0.034**	-0.002	0.002
	(0.018)	(0.017)	(0.021)	(0.019)	(0.016)	(0.016)	(0.017)	(0.005)
Episode with other	0.222***	0.237***	-0.115***	-0.037	-0.001	-0.066**	0.234***	-0.028**
	(0.039)	(0.034)	(0.042)	(0.038)	(0.032)	(0.031)	(0.033)	(0.011)
Episode at home	0.002	0.160***	-0.175**	-0.078	-0.072	-0.005	0.135***	-0.013
	(0.044)	(0.049)	(0.072)	(0.057)	(0.049)	(0.041)	(0.047)	(0.013)
Episode outdoors	0.143***	0.165***	-0.147*	0.007	-0.181***	0.011	0.193***	-0.051***
	(0.054)	(0.060)	(0.084)	(0.075)	(0.067)	(0.063)	(0.060)	(0.016)
Episode indoors	-0.046	0.073	-0.140**	-0.073	-0.120**	0.022	0.075	-0.008
	(0.049)	(0.051)	(0.066)	(0.055)	(0.051)	(0.046)	(0.049)	(0.015)
Age	-0.003	0.024***	0.027***	0.021***	-0.007	0.035***	-0.003	0.001
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.002)
Age squared/100	0.007	-0.018***	-0.027***	-0.025***	0.001	-0.031***	0.009	-0.002
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.002)
Native citizen	-0.087**	-0.110***	-0.109**	0.006	0.013	0.069*	-0.085*	0.036***
	(0.042)	(0.042)	(0.048)	(0.047)	(0.044)	(0.042)	(0.044)	(0.012)
Secondary education	-0.118**	-0.007	-0.134*	-0.041	-0.003	-0.059	-0.010	0.023
	(0.057)	(0.058)	(0.071)	(0.065)	(0.061)	(0.059)	(0.062)	(0.016)
University education	-0.170***	-0.014	-0.048	0.114*	0.113*	-0.086	-0.099*	0.034**
	(0.053)	(0.053)	(0.072)	(0.063)	(0.059)	(0.056)	(0.057)	(0.015)
Employed	0.126***	0.050	-0.144***	-0.079*	0.107**	-0.221***	0.125***	-0.007
	(0.047)	(0.042)	(0.051)	(0.045)	(0.042)	(0.042)	(0.044)	(0.012)
Married or cohabiting	0.092**	0.042	-0.006	0.007	0.020	0.037	0.043	-0.010
	(0.038)	(0.039)	(0.041)	(0.044)	(0.039)	(0.041)	(0.041)	(0.013)
Number of household members	0.027	0.023	0.027	-0.004	0.008	0.013	0.014	0.002
	(0.018)	(0.019)	(0.021)	(0.020)	(0.019)	(0.018)	(0.018)	(0.006)
Number of children	0.000	0.005	-0.062**	0.007	-0.019	-0.020	0.018	-0.007
	(0.024)	(0.024)	(0.026)	(0.025)	(0.024)	(0.022)	(0.023)	(0.007)
Medium family income	-0.030	-0.090*	-0.112**	-0.129**	-0.058	-0.184***	0.035	-0.015
	(0.050)	(0.050)	(0.055)	(0.055)	(0.047)	(0.048)	(0.051)	(0.014)
High family income	-0.059	-0.148***	-0.169***	-0.042	0.012	-0.233***	-0.020	-0.012
	(0.050)	(0.052)	(0.054)	(0.058)	(0.050)	(0.051)	(0.054)	(0.015)
Health status	0.276***	0.133***	-0.353***	-0.332***	-0.354***	-0.666***	0.489***	-0.129***
	(0.051)	(0.049)	(0.057)	(0.054)	(0.046)	(0.056)	(0.054)	(0.018)
Weekend day	0.117***	-0.015	-0.091**	-0.163***	-0.145***	-0.059*	0.129***	-0.020**
	(0.034)	(0.031)	(0.037)	(0.034)	(0.033)	(0.030)	(0.031)	(0.010)
Holiday	-0.008	-0.171	0.181	-0.032	0.231*	-0.017	-0.154*	0.013
	(0.092)	(0.104)	(0.157)	(0.111)	(0.128)	(0.106)	(0.093)	(0.030)

Constant	-0.998***	-1.679***	-0.132	-0.733***	0.680***	-0.370*	-1.099***	0.128**
	(0.186)	(0.188)	(0.201)	(0.202)	(0.203)	(0.192)	(0.203)	(0.061)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	30,824	30,824	30,824	30,824	30,824	30,824	30,824	30,824
Number of individuals	7,865	7,865	7,865	7,865	7,865	7,865	7,865	7,865
R-squared	0.116	0.135	0.072	0.168	0.059	0.140	0.149	0.067

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature (*one year before*) in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B6. Placebo test, maximum temperature from one year before, females

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s (*one year before*)	-0.023	0.011	0.059	-0.006	-0.031	0.069	-0.018	0.030
	(0.063)	(0.064)	(0.069)	(0.067)	(0.069)	(0.067)	(0.069)	(0.024)
50s (*one year before*)	-0.054	0.005	-0.016	0.071	-0.010	0.038	-0.036	0.020
	(0.055)	(0.051)	(0.058)	(0.061)	(0.059)	(0.056)	(0.057)	(0.020)
60s (*one year before*)	-0.081*	-0.023	0.041	0.001	0.008	0.008	-0.051	0.005
	(0.049)	(0.046)	(0.055)	(0.053)	(0.053)	(0.048)	(0.051)	(0.016)
80s (*one year before*)	-0.037	-0.027	-0.084*	0.029	0.017	-0.001	-0.022	0.024
	(0.050)	(0.051)	(0.049)	(0.054)	(0.059)	(0.052)	(0.059)	(0.020)
90s and above (*one year before*)	-0.002	-0.016	-0.075	0.097	0.087	0.011	-0.039	0.010
	(0.069)	(0.059)	(0.066)	(0.079)	(0.077)	(0.073)	(0.074)	(0.025)
(Log) Episode duration	0.022	0.071***	0.028*	0.043**	-0.014	0.037**	0.022	0.002
	(0.017)	(0.016)	(0.015)	(0.017)	(0.018)	(0.017)	(0.018)	(0.006)
Episode with other	0.204***	0.221***	-0.081**	-0.034	0.029	0.024	0.184***	-0.028**
	(0.031)	(0.030)	(0.033)	(0.032)	(0.032)	(0.031)	(0.031)	(0.012)
Episode at home	-0.031	0.244***	-0.040	-0.030	-0.006	0.002	0.112**	-0.039***
	(0.046)	(0.043)	(0.040)	(0.045)	(0.044)	(0.050)	(0.044)	(0.015)
Episode outdoors	-0.060	0.286***	0.049	0.056	-0.060	0.074	0.085	-0.060***
	(0.081)	(0.061)	(0.063)	(0.076)	(0.068)	(0.084)	(0.074)	(0.020)
Episode indoors	0.022	0.158***	-0.065	-0.013	-0.134***	-0.012	0.126***	-0.025
	(0.048)	(0.045)	(0.043)	(0.048)	(0.050)	(0.050)	(0.047)	(0.016)
Age	0.004	0.033***	0.016***	0.018***	0.004	0.033***	0.003	-0.002
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.002)
Age squared/100	0.002	-0.025***	-0.014**	-0.023***	-0.010*	-0.027***	0.004	0.000
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.002)
Native citizen	-0.112***	-0.087**	-0.127***	0.044	0.062	0.037	-0.092**	0.040***
	(0.041)	(0.035)	(0.045)	(0.042)	(0.045)	(0.042)	(0.043)	(0.013)
Secondary education	0.030	0.011	-0.056	-0.059	-0.101	-0.100*	0.082	-0.032*
	(0.056)	(0.052)	(0.057)	(0.062)	(0.063)	(0.060)	(0.059)	(0.017)
University education	-0.040	-0.019	-0.123**	0.046	-0.046	-0.137**	0.025	0.000
	(0.053)	(0.048)	(0.051)	(0.057)	(0.059)	(0.056)	(0.055)	(0.019)
Employed	0.012	-0.023	0.011	-0.085**	0.123***	-0.089**	-0.002	0.007
	(0.034)	(0.032)	(0.033)	(0.035)	(0.037)	(0.036)	(0.035)	(0.011)
Married or cohabiting	0.070**	-0.033	-0.066*	-0.065*	-0.027	-0.070*	0.056	-0.007
	(0.033)	(0.030)	(0.038)	(0.037)	(0.034)	(0.039)	(0.034)	(0.013)
Number of household members	0.047***	0.037**	-0.020	-0.020	-0.018	0.009	0.044**	-0.009
	(0.018)	(0.016)	(0.017)	(0.019)	(0.018)	(0.017)	(0.017)	(0.005)
Number of children	0.000	0.022	-0.034	0.002	0.030	-0.041	0.016	-0.005
	(0.023)	(0.021)	(0.021)	(0.024)	(0.026)	(0.026)	(0.023)	(0.007)
Medium family income	-0.068	-0.098**	-0.059	0.007	0.035	-0.137***	-0.042	0.004
	(0.043)	(0.038)	(0.044)	(0.049)	(0.047)	(0.050)	(0.047)	(0.015)
High family income	-0.151***	-0.218***	-0.095*	-0.001	0.016	-0.223***	-0.098*	0.018
	(0.048)	(0.044)	(0.049)	(0.053)	(0.050)	(0.055)	(0.052)	(0.018)
Health status	0.280***	0.065*	-0.476***	-0.450***	-0.522***	-0.840***	0.595***	-0.136***
	(0.040)	(0.036)	(0.052)	(0.046)	(0.044)	(0.052)	(0.045)	(0.016)
Weekend day	0.030	-0.032	-0.028	-0.084***	-0.066*	-0.069**	0.048	-0.012
	(0.031)	(0.028)	(0.031)	(0.033)	(0.034)	(0.033)	(0.033)	(0.011)
Holiday	0.189**	0.221***	0.115	-0.163**	-0.092	-0.031	0.214***	-0.055***
	(0.074)	(0.067)	(0.099)	(0.077)	(0.088)	(0.091)	(0.078)	(0.019)

Constant	-1.134***	-1.393***	0.398	0.067	0.672*	0.278	-1.339***	0.610***
	(0.333)	(0.188)	(0.247)	(0.438)	(0.400)	(0.291)	(0.348)	(0.133)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	38,189	38,189	38,189	38,189	38,189	38,189	38,189	38,189
Number of individuals	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600
R-squared	0.113	0.143	0.089	0.166	0.085	0.187	0.164	0.087

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature (*one year before*) in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B7. Placebo test, maximum temperature from a random county, males

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s (*random county*)	0.057	0.010	-0.003	-0.168**	-0.095	-0.047	0.091	-0.021
	(0.059)	(0.060)	(0.060)	(0.066)	(0.064)	(0.059)	(0.058)	(0.019)
50s (*random county*)	0.060	-0.050	0.026	-0.052	0.033	-0.013	0.001	-0.027
	(0.061)	(0.060)	(0.063)	(0.063)	(0.059)	(0.059)	(0.058)	(0.018)
60s (*random county*)	0.001	-0.027	0.062	-0.016	0.021	-0.028	-0.018	-0.001
	(0.055)	(0.056)	(0.057)	(0.059)	(0.053)	(0.049)	(0.054)	(0.018)
80s (*random county*)	-0.095	0.028	0.129**	0.058	0.048	-0.007	-0.065	-0.011
	(0.060)	(0.053)	(0.060)	(0.058)	(0.049)	(0.048)	(0.051)	(0.016)
90s and above (*random county*)	0.038	0.063	0.020	0.006	-0.023	0.030	0.040	-0.007
	(0.066)	(0.069)	(0.071)	(0.074)	(0.067)	(0.067)	(0.066)	(0.022)
(Log) Episode duration	0.005	0.048***	0.052**	0.078***	-0.014	0.038**	-0.002	0.001
	(0.018)	(0.017)	(0.021)	(0.019)	(0.016)	(0.016)	(0.016)	(0.005)
Episode with other	0.230***	0.238***	-0.112***	-0.052	-0.011	-0.074**	0.244***	-0.030***
	(0.037)	(0.033)	(0.041)	(0.037)	(0.032)	(0.031)	(0.031)	(0.011)
Episode at home	0.013	0.168***	-0.172**	-0.068	-0.065	-0.009	0.140***	-0.012
	(0.044)	(0.050)	(0.073)	(0.058)	(0.050)	(0.042)	(0.047)	(0.013)
Episode outdoors	0.148***	0.169***	-0.111	0.036	-0.177***	0.027	0.182***	-0.044***
	(0.055)	(0.061)	(0.084)	(0.075)	(0.068)	(0.063)	(0.060)	(0.016)
Episode indoors	-0.041	0.067	-0.134**	-0.064	-0.107**	0.024	0.068	-0.008
	(0.049)	(0.051)	(0.066)	(0.055)	(0.051)	(0.047)	(0.048)	(0.015)
Age	-0.004	0.024***	0.027***	0.021***	-0.006	0.036***	-0.004	0.001
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.002)
Age squared/100	0.009	-0.017***	-0.028***	-0.026***	-0.000	-0.033***	0.011*	-0.002
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.002)
Native citizen	-0.075*	-0.098**	-0.106**	0.011	0.019	0.068	-0.078*	0.034***
	(0.042)	(0.042)	(0.048)	(0.047)	(0.045)	(0.042)	(0.044)	(0.013)
Secondary education	-0.072	0.003	-0.130*	-0.044	-0.020	-0.053	0.016	0.025
	(0.064)	(0.058)	(0.072)	(0.065)	(0.061)	(0.058)	(0.060)	(0.016)
University education	-0.119**	-0.001	-0.059	0.100	0.093	-0.084	-0.064	0.032**
	(0.060)	(0.052)	(0.073)	(0.062)	(0.059)	(0.056)	(0.055)	(0.015)
Employed	0.112**	0.048	-0.145***	-0.079*	0.100**	-0.230***	0.122***	-0.005
	(0.048)	(0.042)	(0.051)	(0.044)	(0.042)	(0.042)	(0.042)	(0.012)
Married or cohabiting	0.078**	0.032	-0.001	0.010	0.019	0.037	0.032	-0.010
	(0.040)	(0.039)	(0.041)	(0.044)	(0.040)	(0.042)	(0.040)	(0.012)
Number of household members	0.030*	0.023	0.031	-0.002	0.012	0.013	0.013	0.002
	(0.018)	(0.019)	(0.020)	(0.020)	(0.019)	(0.018)	(0.018)	(0.006)
Number of children	-0.003	0.007	-0.067***	0.007	-0.025	-0.019	0.020	-0.007
	(0.024)	(0.024)	(0.026)	(0.025)	(0.025)	(0.022)	(0.023)	(0.007)
Medium family income	0.021	-0.080	-0.121**	-0.139**	-0.063	-0.193***	0.066	-0.021
	(0.055)	(0.049)	(0.056)	(0.054)	(0.047)	(0.048)	(0.049)	(0.014)
High family income	-0.011	-0.135***	-0.180***	-0.051	0.006	-0.243***	0.012	-0.017
	(0.056)	(0.051)	(0.054)	(0.058)	(0.049)	(0.051)	(0.052)	(0.015)
Health status	0.274***	0.147***	-0.370***	-0.344***	-0.378***	-0.695***	0.512***	-0.132***
	(0.052)	(0.050)	(0.057)	(0.053)	(0.046)	(0.057)	(0.053)	(0.018)
Weekend day	0.135***	-0.014	-0.089**	-0.161***	-0.149***	-0.046	0.134***	-0.021**
	(0.035)	(0.031)	(0.037)	(0.034)	(0.033)	(0.031)	(0.031)	(0.010)
Holiday	0.042	-0.152	0.144	-0.055	0.187	-0.047	-0.100	0.009
	(0.098)	(0.108)	(0.149)	(0.108)	(0.126)	(0.107)	(0.098)	(0.029)

Constant	-1.100***	-1.736***	-0.125	-0.504**	0.768***	-0.229	-1.257***	0.157**
	(0.209)	(0.194)	(0.215)	(0.208)	(0.206)	(0.195)	(0.200)	(0.063)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	30,525	30,525	30,525	30,525	30,525	30,525	30,525	30,525
Number of individuals	7,787	7,787	7,787	7,787	7,787	7,787	7,787	7,787
R-squared	0.114	0.135	0.076	0.170	0.063	0.145	0.153	0.068

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature (*from a random county*) in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B8. Placebo test, maximum temperature from a random county, females

	Happy	Meaningful	Sad	Stress	Tired	Pain	Net affect	U-index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 50s (*random county*)	-0.076	-0.068	0.003	0.035	0.037	0.078	-0.091	0.034*
	(0.056)	(0.053)	(0.055)	(0.059)	(0.065)	(0.058)	(0.057)	(0.019)
50s (*random county*)	-0.089	-0.124**	0.005	0.001	0.038	0.074	-0.113*	0.033
	(0.058)	(0.055)	(0.052)	(0.060)	(0.063)	(0.054)	(0.062)	(0.021)
60s (*random county*)	-0.171***	-0.129**	0.155***	0.217***	0.109**	0.131**	-0.245***	0.048***
	(0.053)	(0.052)	(0.056)	(0.054)	(0.054)	(0.057)	(0.051)	(0.018)
80s (*random county*)	-0.070	-0.040	0.051	0.025	-0.074	0.022	-0.045	0.021
	(0.046)	(0.046)	(0.046)	(0.048)	(0.057)	(0.049)	(0.054)	(0.016)
90s and above (*random county*)	-0.138**	-0.045	0.011	0.047	0.005	0.018	-0.088	0.035
	(0.059)	(0.063)	(0.060)	(0.063)	(0.067)	(0.067)	(0.066)	(0.026)
(Log) Episode duration	0.020	0.071***	0.025	0.048***	-0.008	0.041**	0.019	0.002
	(0.017)	(0.016)	(0.015)	(0.017)	(0.018)	(0.017)	(0.018)	(0.006)
Episode with other	0.201***	0.219***	-0.080**	-0.024	0.034	0.017	0.180***	-0.029**
	(0.032)	(0.030)	(0.033)	(0.032)	(0.032)	(0.032)	(0.031)	(0.012)
Episode at home	-0.014	0.245***	-0.046	-0.042	-0.007	-0.011	0.124***	-0.035**
	(0.046)	(0.043)	(0.040)	(0.045)	(0.045)	(0.052)	(0.045)	(0.015)
Episode outdoors	-0.056	0.280***	0.041	0.056	-0.067	0.069	0.089	-0.056***
	(0.082)	(0.061)	(0.063)	(0.077)	(0.069)	(0.086)	(0.075)	(0.020)
Episode indoors	0.046	0.148***	-0.079*	-0.037	-0.140***	-0.023	0.142***	-0.023
	(0.049)	(0.045)	(0.043)	(0.049)	(0.051)	(0.052)	(0.048)	(0.016)
Age	0.004	0.035***	0.017***	0.018***	0.001	0.033***	0.004	-0.003
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.002)
Age squared/100	0.001	-0.026***	-0.015***	-0.023***	-0.008	-0.028***	0.003	0.001
	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.002)
Native citizen	-0.108***	-0.072**	-0.123***	0.037	0.053	0.041	-0.081*	0.036***
	(0.041)	(0.035)	(0.045)	(0.043)	(0.046)	(0.042)	(0.043)	(0.013)
Secondary education	0.049	0.017	-0.055	-0.064	-0.092	-0.103*	0.091	-0.035**
	(0.056)	(0.053)	(0.057)	(0.061)	(0.063)	(0.060)	(0.059)	(0.017)
University education	-0.025	-0.012	-0.126**	0.040	-0.043	-0.141**	0.035	-0.001
	(0.054)	(0.048)	(0.051)	(0.057)	(0.058)	(0.055)	(0.055)	(0.019)
Employed	0.005	-0.023	0.022	-0.072**	0.132***	-0.087**	-0.011	0.010
	(0.034)	(0.032)	(0.033)	(0.035)	(0.037)	(0.036)	(0.035)	(0.011)
Married or cohabiting	0.053	-0.032	-0.058	-0.053	-0.009	-0.055	0.039	-0.003
	(0.033)	(0.031)	(0.038)	(0.037)	(0.034)	(0.039)	(0.034)	(0.013)
Number of household members	0.047***	0.034**	-0.020	-0.019	-0.016	0.008	0.042**	-0.009
	(0.018)	(0.016)	(0.017)	(0.019)	(0.018)	(0.017)	(0.017)	(0.005)
Number of children	0.001	0.030	-0.034	0.003	0.028	-0.045*	0.021	-0.006
	(0.023)	(0.022)	(0.022)	(0.024)	(0.025)	(0.026)	(0.023)	(0.007)
Medium family income	-0.078*	-0.102***	-0.055	0.014	0.033	-0.129***	-0.051	0.004
	(0.043)	(0.038)	(0.044)	(0.048)	(0.047)	(0.050)	(0.046)	(0.015)
High family income	-0.158***	-0.226***	-0.096**	-0.001	0.007	-0.230***	-0.101*	0.020
	(0.049)	(0.045)	(0.049)	(0.053)	(0.051)	(0.056)	(0.053)	(0.018)
Health status	0.258***	0.052	-0.469***	-0.449***	-0.512***	-0.837***	0.578***	-0.133***
	(0.040)	(0.036)	(0.052)	(0.047)	(0.045)	(0.053)	(0.045)	(0.016)
Weekend day	0.036	-0.030	-0.030	-0.091***	-0.079**	-0.069**	0.056*	-0.011
	(0.031)	(0.028)	(0.031)	(0.033)	(0.034)	(0.033)	(0.033)	(0.011)
Holiday	0.206***	0.232***	0.096	-0.176**	-0.090	-0.028	0.229***	-0.058***
	(0.076)	(0.070)	(0.101)	(0.076)	(0.091)	(0.091)	(0.080)	(0.020)

Constant	-1.079***	-1.357***	0.333	-0.010	0.649*	0.243	-1.265***	0.602***
	(0.334)	(0.191)	(0.251)	(0.461)	(0.392)	(0.284)	(0.349)	(0.135)
Activity categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of episodes	37,917	37,917	37,917	37,917	37,917	37,917	37,917	37,917
Number of individuals	9,502	9,502	9,502	9,502	9,502	9,502	9,502	9,502
R-squared	0.113	0.144	0.089	0.166	0.086	0.185	0.166	0.087

Notes: Clustered standard errors at the individual level are given in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Dependent variables in columns (1-7) are standardized. Omitted category is maximum temperature (*from a random county*) in the 70s. Estimates are weighted using sampling demographic weights at the activity level. All models control for activity categories, month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

APPENDIX C: ADDITIONAL ANALYSES

Table C1. Cognitive well-being measures

	General health status		
	Pooled	Males	Females
	(1)	(2)	(3)
Under 50s	0.011	0.046	-0.020
	(0.040)	(0.073)	(0.049)
50s	-0.015	-0.017	-0.015
	(0.036)	(0.050)	(0.046)
60s	-0.020	0.023	-0.056
	(0.030)	(0.048)	(0.040)
80s	-0.013	-0.003	-0.019
	(0.032)	(0.038)	(0.041)
90s and above	0.049	0.077	0.026
	(0.035)	(0.049)	(0.047)
Male	-0.024	-	-
	(0.021)		
Age	0.051***	0.051***	0.051***
	(0.005)	(0.008)	(0.004)
Age squared/100	-0.043***	-0.043***	-0.044***
	(0.005)	(0.008)	(0.004)
Native citizen	-0.053**	-0.043	-0.054
	(0.026)	(0.039)	(0.047)
Secondary education	-0.187***	-0.154*	-0.223***
	(0.057)	(0.090)	(0.037)
University education	-0.349***	-0.329***	-0.384***
	(0.061)	(0.094)	(0.045)
Employed	-0.228***	-0.240***	-0.237***
	(0.023)	(0.031)	(0.034)
Married or cohabiting	-0.124***	-0.046	-0.196***
	(0.024)	(0.032)	(0.028)
Number of household members	0.075***	0.062***	0.094***
	(0.012)	(0.011)	(0.019)
Number of children	-0.086***	-0.071***	-0.113***
	(0.014)	(0.017)	(0.024)
Medium family income	-0.247***	-0.176***	-0.294***
	(0.027)	(0.037)	(0.035)
High family income	-0.446***	-0.315***	-0.548***
	(0.028)	(0.041)	(0.034)
Weekend day	-0.011	0.017	-0.037
	(0.021)	(0.028)	(0.028)
Holiday	0.024	0.161	-0.093
	(0.116)	(0.177)	(0.102)
Constant	1.517***	1.320***	1.626***
	(0.087)	(0.127)	(0.146)
Month F.E.	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes
State F.E.	Yes	Yes	Yes
Number of individuals/observations	17,499	7,879	9,620
R-squared	0.110	0.100	0.136

Notes: Clustered standard errors at the state level are given in parentheses. Data come from the 2010, 2012, 2013 and 2021 ATUS WB-Module. Estimation method for specifications is OLS. Omitted category is maximum temperature in the 70s. Estimates are weighted using sampling demographic weights at the individual level. All models control for month, year and state fixed effects, but not shown for brevity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.