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Effects of chronic ethnic discrimination in the daily life of Turkish immigrants living in Austria: study protocol of a 30-day ambulatory assessment study

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ABSTRACT

Introduction Chronic ethnic discrimination is associated with negative mental and physical health outcomes in ethnic minority groups. It is assumed that suffering from repeated discriminatory events leads, over time, to psychological consequences such as higher perceived stress, higher negative affect and lower positive affect. Higher stress reactivity to non-discriminatory stressors, such as daily hassles, as well as anticipation and avoidance behaviour regarding discriminatory events, may further contribute to the overall burden for affected individuals. Studies investigating chronic ethnic discrimination and its psychological consequences in the daily lives of affected persons are lacking. Here, we present a study protocol to investigate the impact of chronic ethnic discrimination and acute discriminatory events in the daily lives of Turkish immigrants living in Austria, using an ambulatory assessment design. The feasibility of our study design was tested and confirmed in a pilot study (n=10).

Methods and analysis Ninety male Turkish immigrants will complete daily questionnaires for 30 days. Participants will indicate stress, perceived discrimination, negative and positive affect, daily hassles, anticipation and avoidance behaviour, as well as rumination with regard to discriminatory events on a daily basis. Furthermore, they will use preprogrammed iPods to assess acute discriminatory events in real time. Our hypotheses will be tested using multilevel analyses.

Ethics and dissemination This study has been approved by the institutional review board of the University of Vienna (reference number 00358). Results will be presented at conferences and submitted for publication in a peer-reviewed journal.

Strengths and limitations of this study

- This is the first study to investigate the direct and time-lagged effects of chronic ethnic discrimination on psychological consequences in the daily life of Turkish immigrants.
- Using an ambulatory assessment design, exposure to discriminatory events will be assessed by electronic devices in the daily life of Turkish immigrants in real-time and over 30 days.
- Psychological consequences (ie, perceived stress, affect, stress reactivity to daily hassles, anticipation and avoidance behaviour, as well as rumination) will be assessed using a daily diary design.
- Two groups will be compared: Turkish immigrants who experience chronic ethnic discrimination and Turkish immigrants who rarely experience ethnic discrimination in their lives.
- This study uses self-report measures, and potential effects due to assessment reactivity (ie, changes in participant experiences and behaviour) may arise.

INTRODUCTION

Numerous studies have documented the negative impact of ethnic discrimination on mental and physical health.[1–4] If frequent experiences of ethnic discrimination are encountered in day-to-day life, they may be perceived as threatening and require the mobilisation of internal resources.[5] Chronic exposure to discriminatory events may thus constitute a persistent social stressor in ethnic minority groups, potentially leading to psychological consequences such as negative affect,[5] higher stress reactivity to non-discriminatory stressors[6 7] and maladaptive coping behaviours.[8–10] However, the mechanisms through which chronic ethnic discrimination (CED) leads to impaired health are not fully understood. A stress and coping framework[11–13] suggests the investigation of psychological mechanisms as well as potential protective factors, coping strategies and resources that may help persons to deal with the psychological consequences of ethnic discrimination.[1 14]

Most studies in this area of research are cross-sectional in nature and do not examine individuals on a day-to-day level. The framework of ambulatory assessment methods—which includes daily diaries and experience sampling[15]—allows for reports of discriminatory events and relevant outcomes over longer periods of time and in real-time, rendering

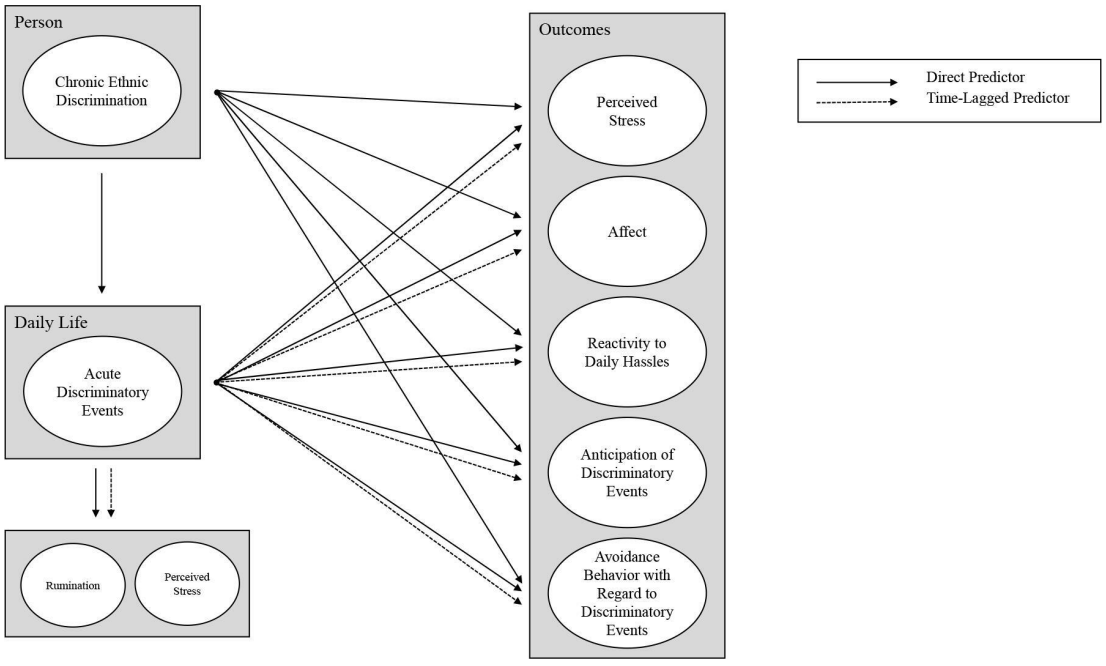

Figure 1 Model of the effects of chronic ethnic discrimination and acute discriminatory events that we plan to investigate in the proposed study.

it possible to investigate between-person and within-person effects without recall bias.[16 17] Compared with single assessments, an ambulatory assessment approach provides highly reliable, ecologically valid and repeated assessments of the outcomes of interest.[18 19] Therefore, we present a study protocol of an ambulatory assessment study that aims to investigate the effects of both CED and acute discriminatory events on stress, affect, stress reactivity to daily hassles, anticipation of discriminatory events and avoidance behaviour with regard to discriminatory events. We plan to investigate these factors over 30 days in the daily lives of Turkish immigrants living in Austria, taking into account direct and indirect (ie, time-lagged) variables. See figure 1 for an overview of the study variables.

Chronic ethnic discrimination as a stressor

Depending on individual factors, any event could be perceived as stressful.[12] Two fundamental mechanisms determine the psychological stress reaction—the exposure and the reactivity to stressful events.[20] In individuals who experience CED, discriminatory events occur frequently and the effects of these events have to be endured over an extended period of time (similar to non-discriminatory chronic stressors).[21 22] It has been suggested that the frequent exposure to chronic stressors, such as discriminatory events, depletes the capability to cope with the stress elicited by these potentially threatening and harmful events.[5 23] The combination of the frequent stress exposure and the burdensome use of coping resources may thus, over time, lead to a higher reactivity to discriminatory events as they continue to occur in daily life.[5 24]

The effects of acute ethnic discrimination in daily life, that is, the psychological responses following a discriminatory event, have not been investigated in detail. Few studies have explored responses to acute discriminatory events in a standardised way in the laboratory.[25 26] However, they were limited to single discriminatory events[27] or exclusion paradigms[28] and did not investigate responses to acute ethnic discrimination in everyday life. Acute discriminatory events in everyday life may occur in many forms and across contexts, that is, they may be subtle or overt, intentional or unintentional, interpersonal or online. All those events may elicit acute psychological responses if they are perceived as discriminatory by the person.

Most studies in the literature have focused on the impact of overt forms of discrimination (eg, threatening behaviour, name-calling), whereas subtle and covert ethnic discrimination has not been investigated as frequently.[29] Subtle ethnic discrimination encompasses behaviours that are low in intensity, and which can easily be denied by perpetrators.[30] This distinct form of ethnic discrimination has also been investigated under the label ethnic/racial microaggressions,[31 32] and it seems to have similar detrimental effects on individuals to overt forms.[29 33 34] It is, therefore, important to account for the different forms of ethnic discrimination when investigating the daily life of ethnic minority groups. In our ambulatory assessment study, any discriminatory event, irrespective of its form, will be reported and included in our analyses.

Affect

Evidence suggests an association between a higher frequency of ethnic discrimination and more negative affect[5 35] as well as less positive affect,[36] supporting the

notion that well-being may be substantially reduced by the emotional impact of discriminatory events.[37 38] Negative affect is a further risk factor for impaired mental and physical health.[39] In addition to cross-sectional studies,[40 41] daily diary studies have also found ethnic discrimination to be an indicator of low levels of daily negative affect.[7 34 42–44]

Stress spillover to daily hassles

The impact that arises from repeated exposure to discriminatory events may also contribute to an accumulation of perceived stress in other domains.[7 45 46] According to this model of stress spillover, the frequent experience of stressful discriminatory events may amplify the reactivity to daily hassles, that is, to negative everyday life events that are potentially stressful.[47] Studies have found that people who are chronically exposed to ethnic discrimination are more likely to report a greater number of stressful life events.[48 49] As different sources of stress in daily life may interact, it is necessary to capture the frequency of and reactivity to daily hassles in a differentiated way in order to understand how CED leads to deleterious psychological outcomes in minority groups.

Coping strategies

Coping refers to various cognitive or behavioural efforts that one undertakes in order to manage situations that are appraised to exceed, strain or tax personal resources.[11 13]The anticipation of future occurrences of discriminatory events might be a predictive factor for the adverse health impact of CED.[50] Several researchers have emphasised that anticipatory and heightened vigilance may constitute a coping strategy that leads to intrusive thoughts or images and may play an important role in determining the negative effects of stressors on health.[46 51] Other maladaptive coping strategies in this context are avoidance behaviour and rumination. Avoidance behaviour may occur after discriminatory events have happened and may manifest in behaviours such as not thinking about the discriminatory event and reducing social contact due to fear of renewed discrimination.[52] Moreover, avoidance behaviour seems to be a predictor of general life stress in Mexican Americans[9 53] and has been associated with worse mental health status.[54–56] Rumination is the tendency to passively perseverate on negative feelings and problems,[57] and it has been found to increase symptoms of depression[58] and negative affect.[59] Potentially, ruminating on negative experiences (eg, after a discriminatory event) exacerbates and prolongs the already existing emotions, further leading to heightened stress.[60]

PROPOSED STUDY

Taken together, past research has illustrated the damaging effects of ethnic discrimination on health.[4 61] Suffering from CED both leads to higher stress and has a negative impact on affect, and also spills over to other domains. Further proximal predictors, such as anticipation and avoidance behaviour, as well as protective factors like coping strategies, have been suggested to play a key role in the processes that ultimately lead to negative effects of ethnic discrimination. Past studies—even longitudinal and diary studies—had limitations in this regard, as they merely looked at single predictors alone, had a limited sampling time period (from 24 hours up to 14 days; with only a small number of studies sampling for 20 days[62 63]), or did not distinguish between the effects of CED and acute discriminatory events.[5–7 16 36 64–66] Due to these limitations of previous studies in this field, we plan to conduct the outlined study in order to add to the understanding of processes that ultimately lead to negative health outcomes for minority groups.

In our proposed study, we will focus on male Turkish immigrants living in Austria. Persons with a Turkish migration background constitute the largest group of non-EU citizens in Austria and other European countries.[67] They are often the target of discrimination,[68] and population-based studies clearly indicate that Turkish immigrants are at increased risk of mental disorders and stress-related physical illnesses.[69 70] Only males will be included since this study is part of a series of studies that also investigates biological factors of CED (eg, using hair cortisol and salivary cortisol levels as outcomes). Due to a greater variability in cortisol levels in females depending on the menstrual cycle phase or the use of hormonal contraceptives,[71] we chose to focus on male participants in these studies. Moreover, women may experience discrimination based on the combination of gender and ethnic background (ie, intersectional discrimination[72]). Since we aim to specifically focus on the consequences of ethnic discrimination, intersectional discrimination would be a potentially confounding factor that we wanted to reduce.

To thoroughly investigate the differential impact of CED on Turkish immigrants living in Austria, we will employ an ambulatory assessment method in a sample of individuals who experience CED and in a comparison group comprising Turkish immigrants who rarely experience ethnic discrimination in their lives (rare ethnic discrimination; RED). Our study will utilise daily diary assessments to depict the effects of CED and acute discriminatory events on perceived stress, affect, stress reactivity to daily hassles, anticipation and avoidance, for 30 consecutive days.

Our hypotheses are as follows:

1. Turkish immigrants who experience CED will report higher perceived stress, lower positive affect, higher negative affect, a higher stress reactivity to daily hassles, higher anticipation of discriminatory events and higher avoidance behaviour with regard to discriminatory events than Turkish immigrants who experience RED.
2. On days when acute discriminatory events occur, Turkish immigrants who experience CED will report higher perceived stress, lower positive affect, higher negative affect, a higher stress reactivity to daily hassles, high-

er anticipation of discriminatory events and stronger rumination than Turkish immigrants who experience RED.
3. Immediately after acute discriminatory events occur, Turkish immigrants who experience CED will report higher perceived stress than Turkish immigrants who experience RED.
4. On the days after the occurrence of acute discriminatory events, Turkish immigrants who experience CED will report higher perceived stress, lower positive affect, higher negative affect and a higher stress reactivity to daily hassles than on days when no acute discriminatory events occurred on the previous day.
5. On days when discriminatory events occur, Turkish immigrants who experience CED will report higher anticipation of discriminatory events and higher avoidance behaviour with regard to discriminatory events than on days when no acute discriminatory events occur.

METHOD

We present the method of our study protocol for the in-depth investigation of the immediate and prolonged effects of both chronic discrimination and acute discriminatory events in the daily life of Turkish immigrants. Participants in this study will provide reports in two ways: at the end of each day via a daily diary questionnaire, and directly after a discriminatory event has occurred via a preprogrammed iPod. In a pilot study conducted from December 2019 to March 2020, we set out to test the feasibility and acceptability of the study design using a small-scale sample of n=10 male Turkish immigrants. Ninety-four percent of all daily assessments were completed by the participants throughout the 30-day assessment, and six discriminatory events were reported. A detailed description of the pilot study is provided in the online supplemental material (see online supplemental table 1).

Participants

We aim to recruit twice as many participants in the CED group than in the RED group to have a sample size that is efficiently powered to compare the two groups over time (hypotheses 1–3) and to detect event-based effects in the CED group alone (hypotheses 4 and 5). We, therefore, conducted power analyses with the software powerlmm[73] using the parameters of our pilot study (94% completed assessments, a mean intraclass correlation of 0.39 and a mean within-variance ratio of 2.12; see online supplemental material. Simulations showed that with group sizes of n=60 and n=30, our study has a power of 82% to detect cross-level interactions[74] with a medium effect size at α=0.05. Therefore, we aim to include a total of n=90 male participants (n=60 Turkish immigrants who experience CED and n=30 Turkish immigrants who experience RED)[75] in this study.

To be considered an immigrant, participants themselves, or at least one of their parents, have to have been born in Turkey (ie, first-generation or second-generation). Further inclusion criteria are male sex, age between 18 and 65 years, sufficient command of the German language, no alcohol or drug abuse, no medical illnesses, no mental disorders and a body mass index between 18 and 30 kg/m^2.

Procedure

For our study, we will recruit participants via advertisements in public places (eg, local shops), and on social media platforms. The study will be conducted in the laboratories of the Faculty of Psychology in Vienna, Austria. Persons who express an interest in participating will undergo a telephone interview and will be screened regarding our eligibility criteria. The absence of a mental disorder will be determined via individual items from the German version of the Structured Interview for Diagnostic and Statistical Manual of Mental Disorders, fourth edition, Axis I Disorders[76] and the Patient Health Questionnaire (PHQ).[77] Furthermore, as our main focus is on the investigation of Turkish immigrants who experience CED, we will ask participants to complete a 10-item version of the Everyday Discrimination Scale (EDS)[78] in a German translation[79] via telephone. The EDS is one of the most widely used measures of perceived discrimination and captures aspects of interpersonal discrimination in daily life.[50] Participants are instructed to report how often they are treated unfairly because of their Turkish background. Items include daily experiences such as being treated with less respect, being treated with less courtesy and people acting as if they think that one is not smart, and will be rated on a 6-point Likert-type scale (1–never, 6–almost every day). The EDS scores will be coded according to a novel approach proposed by Michaels *et al*,[75] which provides a more nuanced exposure assessment than traditional frequency scores, thereby allowing for the comparison of two extreme value groups (ie, CED and RED). In this approach, responses are adjusted to the number of days per year, resulting in the following anchors: 1 (never)=0; 2 (less than once a year)=0.5; 3 (a few times a year)=3; 4 (a few times a month)=36; 5 (at least once a week)=104; 6 (almost every day)=260. A summed value can be calculated—with a potential range from 0 to 2600—referring to the total number of discriminatory events per year (ie, the chronicity). In their study, Michaels *et al*[75] provided evidence for the robustness and sensitivity of this scale-coding approach, and proposed cutoffs with scores of <25 indicating rare exposure to ethnic discrimination and scores of >481 indicating chronic exposure. For the proposed study, we will use a slightly adapted cut-off score for CED (>500) and retain <25 as a cut-off for RED. Potential participants will only be included in the planned study if they fall above or below these cut-off values.

After the screening procedure, participants will be invited to the laboratories of the Faculty of Psychology at the University of Vienna for an introductory session. During this introductory session, participants will

provide written informed consent, complete the baseline measures and will be trained to handle the daily diary questionnaire and a preprogrammed iPod touch (iDialogPad, G Mutz, Cologne, Germany) to report discriminatory events. The definition of discriminatory events (ie, any event that is perceived as discriminatory based on the persons' ethnic background) will be explained and examples of different forms of discriminatory events (eg, subtle, overt) will be provided and discussed. Participants will be instructed to report discriminatory events throughout the assessment time of 30 days via the iPod touch immediately after they are experienced. Additionally, they should provide answers to the daily diary questionnaire every day. The daily diary questionnaire will be completed via an internet survey platform (Unipark EFS Survey, Globalpark, Cologne, Germany), and emails providing a link to each day's questionnaire will be sent every evening at 8 p.m. The daily diary questionnaire can be completed on a personal computer, smartphone or the provided iPod. To match repeated assessments on the daily diary questionnaire, all participants will be provided with an individual code, which they have to enter at every study assessment. Furthermore, a manual will be provided with detailed step-by-step descriptions of the procedure, handling of the iPod, responding to the different items and contact information of the study team.

After completing the study, participants will again be invited to our laboratories to return the iPods and for a postparticipation interview. Each participant will receive 100 € as compensation.

Measures

Baseline

The baseline measures will be presented to participants during the introductory session. First, participants will provide information on their age, sex and education. In the following, we will report the primary variables that are relevant for our hypotheses (ie, the daily diary variables). We will also assess secondary variables that are relevant in the field of ethnic discrimination and health but do not pertain to our specific hypotheses. These variables are cross-sectional and assess aspects of chronic stress, depressive and somatoform symptoms, potential protective factors (eg, in-group identification, acculturation, social support and emotion regulation), as well as personality traits. The secondary variables are listed and described in the online supplemental material, and an overview of all study variables and measures is provided in online supplemental table 2.

Daily diary

In the daily diary assessment, participants will first be asked whether discriminatory events have occurred over the course of the day and if so, to provide detailed descriptions of the event in a text box. Subsequently—and irrespective of the occurrence of acute discriminatory events—current perceived stress and perceived discrimination will be assessed with two items (ie, 'How stressed/discriminated do you feel right now?'). Both items are rated on a 5-point Likert-type scale ranging from 1–not at all to 5–very much.

Affect

To assess daily positive and negative affect, the 20-item Positive and Negative Affect Schedule (PANAS)[80] will be used. The PANAS is one of the most widely used scales to assess affect and was previously validated to assess daily affect.[81] Positive affect (eg, excited, proud) and negative affect (eg, upset, afraid) will be assessed with 10 items each, with responses ranging from 1–not at all to 5–very much.

Daily hassles

Stress reactivity to daily hassles will be assessed with 18 items of the Daily Hassles Scales revised.[82] The items cover negative events from six different domains of life: financial problems, time pressure, work hassles, environmental hassles, family hassles and health hassles. Daily hassles may occur without being perceived as stressful. Therefore, all items are rated on a 5-point Likert scale, with the response options 0–did not occur, 1–occurred, not stressful, 2–occurred, somewhat stressful, 3–occurred, moderately stressful and 4–occurred, very stressful.

Rumination

If a discriminatory event has occurred on a particular day, three items measuring rumination following discriminatory events will be presented. These items ('I kept thinking about it', 'I re-enacted the situation in my mind' and 'I thought about the reasons why I was treated badly') will be rated on a 5-point Likert-type scale ranging from 1–not at all to 5–very much. The items are adapted from the Anger Rumination Scale,[83] which was previously used in the context of ethnic discrimination.[84]

Anticipation of discriminatory events

The anticipation of discriminatory events will be assessed with three items (eg, 'I try to prepare for possible discriminatory events that may happen tomorrow') from the Racism-related Vigilance Scale.[85 86] Items will be rated on a 5-point Likert-type scale ranging from 1–not at all to 5–very much.

Avoidance behaviour with regard to discriminatory events

We will present four items assessing avoidance behaviour with regard to discriminatory events. These items (eg, 'Today, I avoided people or situations because I feared being discriminated against') are adapted from the avoidance subscale of the Coping Strategy Indicator,[52] which was previously used to assess avoidance coping with regard to perceived ethnic discrimination in a sample of African-American students.[55] Items will be rated on a 5-point Likert-type scale ranging from 1–not at all to 5–very much.

Discriminatory events

After experiencing acute discriminatory events during the day, participants should start an assessment by activating the iPod. Subsequently, they will be asked: 'Did you encounter a discriminatory event?', followed by: 'What exactly has happened?', with a range of response options: 'threatened', 'called names or insulted', 'attacked', 'treated as if I knew little/taken for a fool', 'offered advice and opinions I didn't want', 'treated worse, received poorer service', 'denied entry (eg, night club)' and 'other'. These response options were derived from several resources in the literature on unfair treatment and ethnic discrimination[7 87 88] and aim to account for different forms of discriminatory events (ie, overt and subtle, as well as everyday discrimination).

Subsequently, participants will be asked how many persons (from a list of 1–10 or more), and who, discriminated against them, with the response options 'familiar person(s)', 'unfamiliar person(s)', 'the police', 'medical personnel', 'vendor/salesperson', 'service personnel', 'doorman' and 'other'. It is possible to choose multiple options (eg, to choose both familiar person(s) and service personnel to report a waiter who is familiar to the participant) in order to facilitate nuanced responses. The next question asks about the specific area of life in which the event happened, with the response options 'work', 'spare time', 'shopping', 'restaurant/eating or drinking out', 'dealing with government agencies', 'doctor's visit/healthcare setting', 'internet/online gaming' and 'other'. These responses were adapted from a representative study on discrimination by the German Federal Anti-Discrimination Agency.[89] Finally, two items will be presented assessing perceived stress and perceived discrimination during the discriminatory event (ie, 'How stressed did you feel in this situation' and 'How discriminated did you feel in the situation?'), both rated on a 5-point Likert type scale, ranging from 1–not at all to 5–very much.

Data analysis

Analysis will be conducted using the software IBM SPSS 25,[90] HLM 7.03[91] and R 3.6.[92] Descriptive statistics of baseline variables and discriminatory events will be presented, and our hypotheses will be analysed using multilevel models. Repeated data entries at level 1 (ie, stress, affect, reactivity to daily hassles, anticipation of discriminatory events, avoidance behaviour with regard to discriminatory events and rumination) will be nested in participants (level 2).

For hypothesis 1 (effects of CED in daily life), we will compute models with the time-invariant predictor *group* coded as 0/1 (RED/CED) as a random intercept and the daily diary variables as outcomes.

For hypothesis 2 (effects of acute discriminatory events in daily life), random slope models will be computed. These models include the time-invariant predictor *group* as a random intercept, the time-varying predictor *event* coded as 0/1 (acute discriminatory event occurred: no/yes, as indicated in the daily diary assessments) as a random slope, and the cross-level interaction group × event. The outcomes will be the daily diary variables. These models will allow us to explain the variance in the effect of the level 1 predictor *event* with a level 2 predictor *group*.[93]

For hypothesis 3 (immediate effects of acute discriminatory events in daily life), we will compute one model with the time-invariant predictor *group* as a random intercept and the outcome perceived stress immediately after acute discriminatory events occurred. Analyses pertaining to this hypothesis are only possible if the structure of the data permits—especially regarding the frequency and distribution of discriminatory events in the rare discrimination group. Therefore, we may adjust the analyses of hypothesis 3 after data collection is complete (ie, compare immediate stress of the chronic group with a proxy of daily stress in the rare group).

For hypothesis 4 (prolonged effects of acute discriminatory events), random slope models will be computed. These models will include the predictor *group* as a random intercept and a time-varying predictor *event −1* coded as 0/1 (acute discriminatory event occurred on the day before: no/yes, as indicated in the daily diary assessments) denoting the day after the discriminatory event as a random slope. The outcomes will be the daily diary variables. If discriminatory events occurred on two (or more) consecutive days, only the day following the most recent discriminatory event will be included in the analyses.

Finally, for hypothesis 5 (anticipation of discriminatory events and avoidance behaviour with regard to discriminatory events), two models will be computed. These models will include the time-invariant predictor *group* as a random intercept, the time-varying predictor *event* coded as 0/1 (acute discriminatory event occurred: no/yes, as indicated in the daily diary assessments) as a random slope, and the cross-level interaction group × event. The outcomes will be the anticipation and avoidance behaviour variables, respectively, from the daily diary questionnaire.

Ethics and dissemination

The study protocol and the corresponding pilot study were approved by the institutional review board of the University of Vienna (reference number 00358). Informed consent will be obtained by all participants in writing during the introductory session (see Procedure). Data will be collected and stored in a pseudonymised manner with a coded ID stored separately in locked cabinets. Only the project team has access to these cabinets and any personalised data or identifiers. After data collection has finished, all personalised data and identifiers will be deleted. The results of this study will be presented at conferences and submitted to a peer-reviewed journal.

Patient and public involvement

There was no involvement of participants or the public in the development of this study protocol. The results of

this study will be forwarded to interested participants and disseminated via a peer-reviewed journal and at scientific conferences. Furthermore, the results will be disseminated and communicated to relevant stakeholders, persons working in (mental) healthcare and/or persons affected by ethnic discrimination.

ANTICIPATED RESULTS/DISCUSSION

Guided by stress and coping frameworks as well as models of ethnic discrimination, the proposed study aims to examine the direct and indirect effects that both CED and acute discriminatory events exert on stress and stress-related outcomes in Turkish immigrants living in Austria. As noted in our hypotheses, we expect that experiencing CED will lead to reports of more negative outcomes and, furthermore, that acute discriminatory events will have additional negative effects on our outcomes.

The study is based on a pilot study that we conducted to evaluate the feasibility and acceptability of our design. In the pilot study, we were able to recruit a sufficient number of participants in a reasonable period of time, and the compliance with the daily diary assessments was very high. We, therefore, conclude that the design of our pilot study is feasible and can be implemented on a larger scale. However, the cross-sectional reports of perceived ethnic discrimination (ie, the classification of CED according to the EDS, using the cut-off by)[94 95] were discrepant with the occurrence during the sampling period, as only six acute discriminatory events were reported by six persons. This was unexpected, as the number of discriminatory events did not fully correspond to the subpopulation of immigrants we intended to investigate (ie, Turkish immigrants suffering from CED). We conclude that a higher cut-off value should be chosen for inclusion as a chronically discriminated (CED) person in the proposed ambulatory assessment study. Therefore, we will classify participants based on chronicity scores suggested by Michaels *et al*[75] (see Procedure in the Study Protocol).

Several biases may potentially influence the results of our study. Only males will participate in our study and this focus on one gender will not allow us to generalise our findings to other genders. Thus, we may capture discriminatory events that are more often experienced by males than by females and are not able to assess events exclusively experienced by females. However, one large meta-analysis[4] found that gender did not influence the associations between ethnic discrimination and mental or physical health. Selection bias may occur, that is, the participants of our study may not be fully representative of the population of Turkish immigrants living in Austria, since only healthy, non-obese participants that score below or above the cutoffs in the EDS are included. These inclusion criteria are necessary since the goal of our study is to investigate discrimination based on ethnicity as precisely as possible and we are thus unable to assess the impact of ethnic discrimination on unhealthy or impaired participants. In addition, selection bias may arise by our inclusion criteria of a sufficient command of the German language as persons who are experiencing discrimination based on their language skills are not assessed. Furthermore, and due to the language inclusion criteria, our sample may represent a group of persons who are more integrated into Austrian society. Internet access at home will be required for participation, however, internet penetration rates are relatively high in Austria with 89% of all persons in Austria having internet access[96] and internet access is often provided for free at restaurants, cafés, or public organisations.

We assume that the inclusion criteria regarding language and internet access are of little relevance since the sample we recruited for our pilot study provided the first evidence that our recruitment strategy and the design are feasible for people with a broad range of socioeconomic backgrounds. We attempt to limit biases regarding social desirability or assessment reactivity (due to the long assessment period) with a thorough briefing and training during the introductory session and by providing a study manual to participants. Importantly, the results of our study will be interpreted with caution and in light of all putative biases.

Overall, investigating the direct and indirect ways in which ethnic discrimination may impact the everyday life of ethnic minority groups is crucial to facilitate the understanding of the link between ethnic discrimination and health. Moreover, our findings will inform the development of ecological momentary interventions that target the negative effects of ethnic discrimination in the daily lives of affected persons.

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Contributors AG, UMN and RM contributed to the conception and design of the study protocol. AG collected the data for the pilot study, analysed the data and wrote the first version of the manuscript. RM was the principal investigator of the study and was a major contributor in writing the manuscript. UMN provided critical revisions to the manuscript. All authors approved the final version of the manuscript and provided approval for publication.

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1 **Supplementary Material**

SUPP. MATERIAL STUDY PROTOCOL CHRONIC ETHNIC DISCRIMINATION

Pilot Study

We set out to test the feasibility and acceptability of our design by conducting a pilot study, upon which our protocol is based. Here, we report the method and results of our pilot study and discuss implications for the large-scale implementation of our study design.

Method

Procedure

For the pilot study, we recruited participants via advertisements in public places (e.g., local shops), and on social media platforms from December 2019 to March 2020. The screening procedure was identical to the procedure described in our study protocol. For the definition of chronic ethnic discrimination, we assessed ethnic discrimination with the Everyday Discrimination Scale (EDS; Williams, Yu, Jackson, & Anderson, 1997) and used a cutoff based on the definition of high levels of everyday discrimination by Mays & Cochran (2001) and Pérez, Fortuna, & Alegría (2008). Participants were instructed to report how often they were treated unfairly because of their Turkish background. Items were rated on a 6-point Likert-type scale (1–never, 6–almost every day) and participants were subsequently included if they indicated that at least 50% of these items happened to them at least a few times per month (response option 4); this translates into a score of ≥ 25 in the EDS, which classified them as experiencing chronic discrimination. Initially, 34 persons contacted us to express their interest, of whom ten fulfilled our inclusion criteria and were thus included in the pilot study.

The introductory session (informed consent, baseline measures, and training on the daily diary measures and the iPod) was conducted at the Faculty of Psychology, University of Vienna. This session, as well as its procedure, was identical to the procedure described in our study protocol.

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Participants

The sample of the pilot study comprised $N = 10$ male Turkish immigrants who were living in Vienna, Austria, or the adjacent Federal states. Their mean age was 28.8 years (SD = 9.1; range: 21–50 years). Four participants were born in Turkey and had been living in Austria for 4.8 years on average ($SD = 4.1$; range: 1–10); the remainder were born in Austria. Four participants had Austrian citizenship. Half of the sample had a university degree; the remainder had completed higher-track schooling ($n = 3$) or compulsory schooling ($n = 2$). One person was unemployed. Four of the ten participants reported that German was their native language, and the remainder indicated a very good command of the German language.

Measures

Baseline

The baseline measures were presented to participants during the introductory session. We assessed the following cross-sectional variables to gain a thorough descriptive overview of our sample regarding perceived discrimination, health status, and perceived stress. A comprehensive description of the measures of the pilot study can be found in the Secondary Variables section of the Supplementary Material below.

Perceived discrimination. In addition to the EDS (see Procedure), the short form of the Behaviors from Intergroup and Affect Treatment Scale (BIAS-TS; Sibley, 2011) was used to assess different forms of ethnic discrimination.

Depressive and somatoform symptoms. The depression module (PHQ-9) of the Patient Health Questionnaire (PHQ; Löwe, Zipfel, & Herzog, 2002) was used to examine depressive symptoms. The somatoform module (PHQ-15) of the PHQ was used to assess somatoform symptoms.

Perceived stress. The short form of the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to measure perceived stress.

Discriminatory Events

The reporting, classification, and assessment of perceived stress and discrimination of the discriminatory events was conducted—via a preprogrammed iPod touch—as reported in the study protocol.

Daily Diary

The daily diary assessment was identical to the assessment described in the main study, yet the pilot study only included the outcomes daily perceived stress, daily perceived discrimination, and daily affect—assessed with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Within-person Cronbach's alpha was .78 for perceived stress, .95 for perceived discrimination, .99 for positive affect, and .98 for negative affect in this study.

Data Analysis

Repeated data entries at level 1 (i.e., stress, discrimination, and affect) were nested in participants (level 2). Descriptive statistics of baseline variables and discriminatory events are presented. Analyses were conducted in R 3.6.1 (R Core Team, 2019). To probe the effect of acute discriminatory events on perceived stress, perceived discrimination, and affect over the 30 days, hierarchical linear models were conducted with the package lm4 (Bates, Mächler, Bolker, & Walker, 2015). *p*-values of the hierarchical linear models were supplied by the package lmerTest (Kuznetsova, Brockhoff, & Christensen, 2017). Intraclass correlations (i.e., the proportion of variance in the outcomes accounted for by the nesting in participants) were .10 for perceived stress, .56 for perceived discrimination, .50 for positive affect, and .38 for negative affect. Therefore, two separate random intercept models were analyzed: models with a time-varying predictor *event* coded as 0/1 (acute discriminatory event occurred: no/yes) for the effect of acute discriminatory events on each of the daily diary variables on the same day; and models with a time-varying predictor *event -1* coded as 0/1 (acute discriminatory event

occurred on the day before: no/yes). This enabled us to test the direct and the time-lagged effect of discriminatory events on each of the daily diary variables.

Results

Results of Baseline Measures

Passive harm was reported more frequently than active harm by our sample (see Supplementary Table 1). The results of the PHQ-9 indicated mild impairment regarding depressive symptoms and the scores on the PHQ-15 were at the upper end of a low level of somatoform symptom severity. Perceived stress of the sample (M = 15.18) was, on average, higher compared to a representative German sample of men without (M = 11.93) and with a migration background (M = 13.27) reported in a study by Klein et al. (2016).

SUPP. MATERIAL STUDY PROTOCOL CHRONIC ETHNIC DISCRIMINATION

Supplementary Table 1.

Sample Characteristics of the Pilot Study.

Baseline Characteristics	***M***	***SD***	***Mdn***	**Range**
EDS	33.00	4.11	32.00	27–41
BIAS-TS				
Active Harm	1.77	0.86	1.50	1–3.33
Passive Harm	3.27	1.16	3.50	1.33–5.33
PHQ-9	5.20	1.99	5.00	3–8
PHQ-15	4.50	2.32	4.50	1–9
Perceived Stress (PSS-10)	15.80	3.39	15.00	12–24
Daily Diary Variables				
Perceived Stress (Single Item)	2.07	1.13	2	1–5
Perceived Discrimination (Single Item)	1.27	0.72	1	1–5
PANAS Positive Affect	2.55	0.81	2.60	1.00–4.80
PANAS Negative Affect	1.53	0.62	1.30	1.00–4.70

Note. EDS = Everyday Discrimination Scale, BIAS-TS = Behaviors from Intergroup and Affect Treatment Scale, PSS-10 = Perceived Stress Scale 10-item version, PHQ-9 = Patient Health Questionnaire (depression module), PHQ-15 = Patient Health Questionnaire (somatoform module), PANAS = Positive and Negative Affect Schedule

Occurrence and Description of Acute Discriminatory Events

Six acute discriminatory events were reported by six participants over the course of the 30-day assessment. Four of the six events were categorized as ‘being treated worse’ and two were reported via the category ‘other’; these were described as 1) being approached in English because the other person assumed no command of German, and 2) a neighbor behaving in a nervous way around them. The median of the number of perpetrating persons was 1 (M = 1.5, SD = 0.84, range: 1–3). Perpetrating persons were the police and service personnel (one event each), and all but one person—a janitor—were unfamiliar to the participants. Two events occurred while dealing with government agencies; the options during work and leisure time were each reported once. The remaining two events were categorized as ‘other’, as they occurred in the elevator of their home apartment building and at school.

During the acute discriminatory events, perceived stress was reported, on average, with a mean of 3.40 (*SD* = 1.67, *Mdn* = 3, range: 1–5) and perceived discrimination with a mean of 3.20 (*SD* = 1.30, *Mdn* = 3, range: 2–5).

Results of the Daily Diary Assessment

Ninety-four percent of all daily assessments were completed, and participants completed the assessment, on average, for 28.1 days (*SD* = 2.8). The results of our hierarchical linear models revealed that perceived discrimination was rated higher when acute discriminatory events had occurred on the same day, compared to days when it had not (b = 2.47, $p < .001$). Furthermore, discriminatory events were associated with more negative affect (b = 0.43, p = .033), but did not have an impact on positive affect (b = -0.28, p = .250) and perceived stress (b = 0.79, p = .079). Our time-lagged analyses showed no prolonged effect of discriminatory events on one day on perceived stress, perceived discrimination, positive affect, and negative affect on the following day (all ps > .376).

Secondary Variables of the Study Protocol

Here, we provide information about secondary variables that will be used in the proposed study described in the study protocol. Secondary variables may serve as outcome, control, moderator and/or mediator variables in exploratory as well as secondary analyses. A complete list of all study variables (including secondary measures) can be found in Supplementary Table 2.

Perceived Discrimination

In addition to the EDS (see Procedure of the study protocol), the BIAS-Treatment Scale (BIAS-TS; Sibley, 2011) will be used to assess different forms of ethnic discrimination. This is based on the BIAS map (Cuddy, Fiske, & Glick, 2007) and detects four different kinds of harmful and facilitatory behavior that individuals may encounter: active harm (i.e., intention to hurt), passive harm (ignorance, undermining the social value), active facilitation (benefiting a group), and passive facilitation (instrumental collaboration to pursue one's own aims). Active and passive harm are assumed to have negative consequences for the group member (Fiske, 2018; Fiske, Cuddy, Glick, & Xu, 2002).We will apply a short form (Sibley, 2011) with three items for each scale, and items will be rated on a 7-point scale (1 = have never experienced this, 7 = often experience this).

Depressive Symptoms

In addition to the screening (see Procedure of the study protocol), in which we will assess mental health in a categorical way as an exclusion criterion, we aim to assess depressive and somatoform symptoms dimensionally. The depression module (PHQ-9) of the Patient Health Questionnaire (Löwe et al., 2002) will be used to examine depressive symptoms. The nine items cover impairment in the last two weeks in close correspondence with the diagnostic criteria of the DSM-IV for depressive disorders (APA, 2000). Items will be presented on a 4-point Likert-type scale (0–not at all, 1–several days, 2–more than half the days, and 3–nearly every day) and refer to the last two weeks.

148 Supplementary Table 2

149 Overview of all study variables and measures.

Measures		**Baseline**	**Event**	**Daily Diary**
Perceived Discrimination	Single Likert-type item		x	x
	BIAS-TS	x		
	EDS	x		
Depressive Symptoms	PHQ-9	x		
Somatoform Symptoms	PHQ-15	x		
Perceived Stress	Single Likert-type item		x	x
	PSS-10	x		
Stress Reactivity	SRS	x		
Chronic Stress	SSCS	x		x
Stress Reactivity to Daily Hassles	DSH-R			x
Affect	PANAS			x
Anticipation of Discriminatory Events	3 Likert-type items			x
Avoidance of Discriminatory Events	4 Likert-type items			x
Rumination following Discriminatory Events[1]	3 Likert-type items			x
Discrimination-Specific Coping	BRIEF Cope	x		
Social Support	BSSS	x		
In-Group Identification	SIS	x		
Acculturation	FRAKK	x		

Emotion Regulation	ERQ	x	
Resilience	RS-11	x	
Personality Traits	BFI-10	x	x
Anxiety	STAI-T	x	x

Note. EDS = Everyday Discrimination Scale (Williams et al., 1997), BIAS-TS = Behaviors from Intergroup and Affect Treatment Scale (Sibley, 2011), PHQ-9 = Patient Health Questionnaire depression module (Kroenke, Spitzer, & Williams, 2001), PHQ-15 = Patient Health Questionnaire somatoform module (Kroenke, Spitzer, & Williams, 2002), PSS-10 = Perceived Stress Scale 10 (Cohen & Williamson, 1988), SRS = Stress Reactivity Scale (Schulz, Jansen, & Schlotz, 2005), SSCS = Screening Scale for Chronic Stress (Schulz, Schlotz, & Becker, 2004), DSH-R = Daily Hassles Scale Revised (Holm & Holroyd, 1992), PANAS = Positive and Negative Affect Schedule (Watson et al., 1988), BRIEF Cope = Brief Version of the Coping Orientation to Problems Experienced Inventory (Carver, 1997), BSSS = Berlin Social Support Scales (Schulz & Schwarzer, 2003), SIS = Social Identity Scale (Cameron, 2004), FRAKK = Frankfurt Acculturation Scale (Bongard, Pogge, Arslaner, Rohrmann, & Hodapp, 2002), ERQ = Emotion Regulation Questionnaire (Gross & John, 2003), BFI-10 = Big Five Inventory 10-Item Version, STAIT-T = State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, & Jacobs, 1970).

Somatoform Symptoms

To assess somatoform symptoms, we will use the somatoform module (PHQ-15) of the PHQ (Löwe et al., 2002). The module assesses 15 common physical complaints referring to the last four weeks (e.g., stomach and back pain; pain in arms, legs, or joints; pain or problems during sexual intercourse). As our sample will consist only of male participants, the item "menstrual cramps or other problems with your periods" will be excluded. Items will be answered on a Likert-type scale (0–not at all, 1–bothered a little, and 2–bothered a lot). The scores can be summarized, with higher values indicating a higher level of somatic symptom severity.

Perceived Stress

The Perceived Stress Scale (PSS; Cohen et al., 1983) will be used to measure perceived stress. We will use a short scale with ten items (Cohen & Williamson, 1988) and participants will be asked to report how often they have felt a certain way (e.g., "In the last month, how often have you felt that you were unable to control the important things in your life?"). Items will be rated on a 5-point Likert-type scale (0 = never, 4 = very often), with higher scores indicating a higher level of perceived stress.

Chronic Stress

Chronic stress within the last three months will be measured by the 12-item Screening Scale of Chronic Stress (SSCS). The SSCS is part of the Trier Inventory for the Assessment of Chronic Stress (TICS; Schulz et al., 2004). Example items are "I feel overwhelmed by my tasks" and "Sometimes I am consumed by my worries". Items are rated on a 5-point Likert-type scale (1 = never, 5 = very frequently).

Stress Reactivity

Reactivity to potentially stressful situations will be assessed using the 29-item Stress Reactivity Scale (SRS; Schulz et al., 2005). The SRS defines stress reactivity as a person's disposition to respond to stressors with immediate, intense, and long-lasting stress

reactions. Items encompass a wide range of stressful situations, each with three response options. Example items are "If I have little time for my work", with the response options: "1 = I mostly stay calm; 2 = I mostly get uneasy; 3 = I mostly get quite hectic", and "When I have to speak in front of other people", with the response options: "1 = I am mostly very nervous; 2 = I am mostly slightly nervous; 3 = I generally keep my balance".

Discrimination-Specific Coping

Coping strategies may be protective resources—e.g., religious coping (Szymanski & Obiri, 2010) and problem-focused coping (West, Donovan, & Roemer, 2009; Williams et al., 1997)—and buffer the effects of ethnic discrimination on stress and well-being (for a review, see Brondolo, Ver Halen, Pencille, Beatty, & Contrada, 2009). However, maladaptive ways to cope with ethnic discrimination, such as substance use (Gerrard et al., 2012), venting one's anger, and behavioral disengagement (Kaholokula et al., 2017) have been associated with higher levels of stress.

Discrimination-specific coping will be assessed with the Brief Coping Orientation to Problems Experienced Inventory (Brief COPE; Carver, 1997), which is the short form of the original COPE (Carver, Scheier, & Weintraub, 1989). The Brief COPE contains 28 items and 14 scales. In our study, we will use twelve scales (24 items) and omit the scales Emotional Support and Instrumental Support, as they are measured with the Berlin Social Support Scales (see below). All items of the Brief COPE are rated on a 5-point scale (1 = never, 5 = always). We reformulated the instructions to measure coping specifically after perceived experiences of ethnic discrimination, i.e., discrimination-specific individual coping (c.f., Brown, Phillips, Abdullah, Vinson, & Robertson, 2010; Plummer & Slane, 1996). Typical items of the Brief COPE are "I've been refusing to believe that it has happened" and "I've been using alcohol or other drugs to make myself feel better.".

Social Support

Perceived social support has been found to be particularly beneficial to psychological adjustment and well-being in ethnic minority groups (Ajrouch, Reisine, Lim, Sohn, & Ismail, 2010; Noh & Kaspar, 2003; Vega, Kolody, Valle, & Weir, 1991), and access to a supportive social network may be crucial in terms of adaptation to and reduction of stress caused by ethnic discrimination (Schmitt, Postmes, Branscombe, & Garcia, 2014).

Social support will be assessed with the Berlin Social Support Scales (BSSS; Schulz & Schwarzer, 2003). The BSSS contains 33 items and five scales. For this study, only the 8-item subscale perceived social support will be used. For all items, we have specifically reformulated the instructions to refer to ethnic discrimination, similar to the instructions of the Brief COPE. Example items are “When I feel sad, there are people who cheer me up” and “When I am worried, somebody is there to help me”. The items will be rated on a 4-point Likert-type scale (0 = completely agree, 3 = completely disagree).

In-group Identification

In-group identification has been postulated as a factor that potentially influences the association between ethnic discrimination and health (Mewes, Asbrock, & Laskawi, 2015). According to the social identity theory (Cameron, 2004), in-group identification is an important part of an individual’s self-concept. A high level of in-group identification, which translates into high levels of affective (i.e., perceived pride) or cognitive (i.e., perceived importance) connections to one’s in-group, may provide people with the resources to counteract the harm caused by discrimination (Brondolo et al., 2009; Jetten, Haslam, Cruwys, & Branscombe, 2017).

In-group identification will be assessed with the 12-item Social Identity Scale (Cameron, 2004). This scale measures social identity on the basis of its three components: cognitive centrality (the importance of the group for one’s self-concept), in-group affect (positive or negative affect associated with being a group member), and in-group ties

(perceived similarity, bond, and belongingness to other group members). Typical items of the Social Identity Scale are "I often think about the fact that I am a [Turk]." and "I feel strong ties to other [Turks].". Items will be rated on a 6-point Likert-type scale (1 = strongly disagree, 6 = strongly agree).

Acculturation

Acculturation describes psychological processes that occur when individuals of minority groups come into first-hand contact with individuals of the cultural majority (J. W. Berry & Sam, 1997; Oppedal, Røysamb, & Heyerdahl, 2005). The degree of acculturation is typically equated with language acquisition, general culture acquisition, and integration into the host society (Rudmin, 2009). Importantly, in the context of perceived ethnic discrimination, an adoptive degree of acculturation is assumed to be a protective and amplifying resource for affected individuals (e.g., Noh & Kaspar, 2003).

Acculturation will be measured with the 15-item Frankfurt Acculturation Scale (FRAKK; Bongard et al., 2002). The FRAKK assesses the degree to which a person is oriented towards the host culture via statements revolving around language and media use as well as their degree of connectivity in social networks (example items: "I use [Turkish] mass media (TV, press, magazines, etc.)" or "I follow political developments in [Austria]."). Items are rated on a 7-point Likert-type scale (0 = never, 6 = always).

Emotion Regulation

Emotion regulation will be assessed using the 10-item Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). The ERQ measures emotion regulation on the two subscales suppression (i.e., inhibition of emotion-expressive behavior) and reappraisal (i.e., cognitive change of the emotion-eliciting situation to change its impact). The German version (Abler & Kessler, 2009) will be used in the current study. Example items are "I control my emotions by not expressing them" (suppression) and "When I want to feel more positive

emotion (such as joy or amusement), I change what I'm thinking about." (reappraisal). Items are presented on a 7-point Likert-type scale (1 = completely disagree, 7 = completely agree).

Resilience

Resilience will be assessed with the 11-item Resilience Scale (RS-11; Schumacher, Leppert, Gunzelmann, Strauß, & Brähler, 2005), which is a short form of the original Resilience Scale with 25 items (Wagnild & Young, 1993). Resilience potentially moderates the negative effects of stress and promotes adaptation. Example items of the RS-11 are "When I make plans, I follow through with them" and "I can usually look at a situation in a number of ways". Items are rated on a 7-point Likert-type scale (1 = disagree, 7 = agree).

Personality Traits

We will measure the Big Five personality traits (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) with the Big Five Inventory 10 (BFI-10; Rammstedt & John, 2007). The BFI-10 is a 10-item version of the NEO Personality Inventory Revised (NEO-PI-R; Costa & McCrae, 2008) and assesses each of the five personality traits with two items. Example items are "I see myself as someone who is reserved" and "I see myself as someone who has an active imagination". Items are rated on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree).

Anxiety

Anxiety will be measured with the trait anxiety subscale of the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970). Trait anxiety is defined as a stable interindividual characteristic of evaluating situations as threatening (i.e., anxious tendencies). In the German translation (Laux, Glanzmann, Schaffner, & Spielberger, 1981), state anxiety is measured with 20 items on a 4-point Likert-type scale (1 = never, 4 = very frequently). Example items are "I think I feel worse than other people do" and "I get nervous and anxious when I think about my current responsibilities".

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