

**Queer Minority Stress and Resilience in everyday life: An ecological
momentary assessment study**

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Abstract

Background. Queer people (i.e., sexual and gender minorities) report higher rates of adverse mental health and well-being than their cisgender and heterosexual peers. This disparity can be explained as a function of stress experienced due to minority identity membership. Specifically, queer minority stress and resilience processes. Distal stress summarises instances of stigma being enacted upon an individual. Such stigma may be internalised as negative beliefs by the individual, leading to proximal stress. Both stressors are associated with adverse mental health and well-being. These associations are buffered by resilience factors of positive coping. The current study investigated the variability of these constructs throughout everyday life and their within-person associations. **Methods.** Ecological momentary assessment was applied across 14 days, consisting of five daily assessments through brief surveys. The sample (N = 22, Mage= 22.86) was 91% Dutch, 100% sexual minorities, 73% gender minorities, and recruited through local queer associations. Conditional process analysis (CPA) was applied to investigate within-person associations between constructs, combining hierarchical linear modelling and moderated mediation analysis. **Results.** Event-based constructs were found to have substantial portions of within-person variability and constructs relating to internally held beliefs were better explained by differences on the between-person level. CPA results affirmed the theoretical framework. Distal stress predicted momentary increases adverse mental health and well-being directly, and through proximal stress. Resilience was positively associated with mental health and well-being and functioned as buffering in many indirect associations. **Discussion.** The study demonstrates the extent to which minority stress and resilience processes are relevant on an event-level in the daily lives of queer people. Researchers should aim to mitigate minority stress and enhance resilience factors amongst queer people on both interpersonal and intrapersonal levels moving forward.

Keywords: LGBTQIA+, minority stress, resilience, well-being, ecological momentary assessment

Queer Minority Stress and Resilience in everyday life: An ecological momentary assessment study

Queer people (i.e., sexual and gender minorities, e.g., gay, lesbian, transgender, non-binary people) represent the diversity and complexity that is integral to the human experience. However, as a minority group, they are burdened by societal stigma (Veldhuis et al., 2018). Such stigma is connected to pronounced health disparities experienced by queer people (Mezza et al., 2024). The link between this lies in unique stressors people are subject to as a function of minority identity, referred to as minority stress (Testa et al., 2015). This study examines stigma, minority stress, resilience, and mental health and well-being in queer people. Specifically, how these processes are observable in everyday life as a function of changes within individuals over time.

The term 'queer' serves as an umbrella term for sex, gender, and sexual minorities. In the literature, 'sex' is commonly used to summarise an organism's physical and physiological sexual characteristics, including chromosomes, reproductive anatomy, genetic expression, and hormonal functioning (Testa et al., 2015). 'Gender' most commonly refers to socially constructed roles, (sexual) behaviours, expressions, and expectations exhibited and experienced by people in society, as well as the cognitive and emotional self-identification with specific dimensions of gender (Testa et al., 2015). Sexual and Gender minorities are colloquially summarised by the term 'queer' because the central characteristic of queerness is a departure from cis-hetero normative conceptions about sex, gender and associated (sexual) behaviours and expressions¹ (Barker & Sgheele, 2019). Cis-hetero normativity is the most salient set of beliefs about sex and gender and forms the dominant social organisational structure of western, educated, industrialised, rich, democratic (WEIRD) societies (Franco-Rocha et al., 2023). Cis-hetero normativity is a suit of institutional, cultural, and legal assumptions, claiming that physical sexual characteristics identified at birth dictate gender within an unchangeable, binary system of men/males and women/females (cisgender); and only attraction between the two 'opposite' genders is natural or acceptable (heterosexual). Conforming to these norms grants privilege by virtue of belonging to the majority group. Deviation from dominant majority groups norms leads to a lesser allocation of privilege and, in turn, more stigmatisation² (Butler, 1999; Davis, 2010; Franco-Rocha et al., 2023).

¹ For a more extensive exploration of sex and gender, please consult the [supplementary materials](#).

² For a discussion of privilege and how forces of patriarchal cis-hetero normality, capitalism, and colonialism shape contemporary oppressive power dynamics, read *Women, Race & Class* by Angela Y. Davis (2010).

Health Disparities experienced by Queer People

Queer people experience heightened stigmatisation and stereotyping as a function of deviating from the dominant social norms of cis-hetero normativity. This interplay sets the stage for understanding the severe health disparities observed between queer and cis-hetero people (Kidd et al., 2016). The World Health Organisation (WHO) defines health as a 'state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO, 2020). Thus, both dimensions of mental health and well-being must be considered when examining psychological health disparities. Dutch sexual minorities are more likely to suffer from Axis 1 disorders, substance use disorders, anxiety disorders, and mood disorders than heterosexual peers (Sandfort et al., 2015). Cross-national evidence from the World Mental Health Survey found odds-ratios for sexual minorities experiencing major depressive disorder and dysthymia of 2.5, bipolar disorder of 4.0, any mood disorder of 2.8, and any anxiety disorder of 29.7 compared to heterosexual participants (Gmelin et al., 2022). Similarly, odds-ratios reported in U.S. gender minorities are 2.32 for depression, 2.9 for anxiety, 1.64 for eating disorders, 2.66 for non-suicidal self-injury, 3.67 for suicidal ideation, 5.18 for suicide plans, and 4.42 for suicide attempts across the past year compared to cisgender peers (Lipson et al., 2019). Furthermore, queer people report lower well-being than cis-hetero peers across dimensions such as life purpose, community belonging, physical and mental health, and financial well-being (Stacey et al., 2022). Correspondingly, the mental health and well-being dimensions of interest to the current study are depression, anxiety, and psychological, emotional, and social well-being.

Stress, Health, and Minority Identities

Experiences of enacted stigma result in stress, which results in adverse mental health and well-being outcomes (Epel et al., 2018). To understand this association, theories of stress and health are reviewed first. These theories are then connected to minorities and the unique minority stress they may experience as a function of stigma.

Contemporary interdisciplinary literature posits stress as a bio-psycho-social phenomenon, occurring as a function of interactions between individuals and their environments, dependent on context (Epel et al., 2018). A much-cited psychological framework is the transactional model of stress by Lazarus & Folkman (1984). Here, stress is described as an experience of disequilibrium, resulting from the continuous appraisal of environmental transactions, and adaptive coping processes to reach equilibrium (Biggs et al.,

2017). Stressors may be internally or externally demanding and taxing or exceeding the available coping resources. Continued experiences of disequilibrium, meaning the pervasion of stressor demands and failure to cope, may lead to adverse health outcomes (Biggs et al., 2017). This theory describes a psychological perspective on stress. Expanding this frame, psychological dimensions further interact with various physiological dimensions. Amongst these are the hypothalamic-pituitary-adrenal axis and cortisol levels, cellular aging and telomere length, and altered neural functioning and structure (Epel et al., 2018). As such, stress is connected to both negative emotions and physiological disturbances. It has been linked to various negative psychological and physiological health outcomes, including anxiety, depression, biological aging, and (early onset of) disease (Berjot & Gillet, 2011; Biggs et al., 2017; Epel et al., 2018). Another pertinent part of stress is the perception of stressors and coping resources, as highlighted by Epel et al. (2018). Individuals are objectively exposed to, and subjectively experience stressors within the context of their life. This includes 'individual-level characteristics such as personality and demographic factors, the environment in which one lives, current and past stressor exposures, and protective factors; all of which combine to determine the baseline allostatic state of physiological regulation, and the lens through which stressors are perceived and assigned meaning' (Epel et al., 2018). Critical for the current study is an individual's characteristic of being queer, leading to stress experienced specifically as a function of queer minority status and identity.

The concept of minority stress has gained prominence in the psychological literature over the past three decades (Mezza et al., 2024). The general proposition is that minority groups experience stigma by virtue of their deviance³ (i.e., difference) from majority groups, resulting in stress (Berjot & Gillet, 2011). Illustrative examples include stressors arising through racism against Black Indigenous people of colour (BIPOC) and heterosexism against homosexuals (Davis, 2010). Prominent frameworks focussed on queer people are the minority stress theory (MST) for lesbian, gay, and bisexual populations by Meyer (1995), and the gender minority stress and resilience (GMSR) theory and measurement instrument by Testa et al. (2015). These models summarise distal and proximal stressors, as well as protective resilience factors. First, distal stressors encompass observable instances of enacted stigma, meaning prejudice events like discrimination or violence (Meyer, 1995). Distal

³ Notably, it is the marginalisation of identity leading to the experience of stressors, not the minority identity membership itself (Testa et al., 2015). Whereas queerness has historically been viewed as indicative of pathology, the minority stress approach destigmatises queerness and shifts the focus onto processes of marginalisation (Meyer, 1995; Panza et al., 2021). Thus, it offers a more holistic explanation for mental health disparities in queer people.

stressors can elicit high stress responses as they often present acutely dangerous situations with little control. Second, proximal stressors encompass negative internalised schema, derived from such events and minority identity membership (Meyer, 2003). As such, specific cognitions connected to distal stress are themselves classified as stressors. Third, resilience factors of coping and social support denote positive, protective influences of minority identity membership, on both individual and community levels (Meyer, 2015). In line with general stress research, stressors are negatively associated with mental health and well-being. Resilience factors are conceptualised as protective and buffering these associations (Epel et al., 2018; Meyer, 2015). For the current study, queer minority stress and resilience (QMSR) is the term used to encompass the body of literature on minority stress and resilience processes across sexual and gender minorities (i.e., queer people) and associated frameworks.

Queer Minority Stress and Resilience Frameworks

A wealth of literature documents processes under the QMSR umbrella and robust associations with health. Large systematic reviews have examined connections of QMSR dimensions with suicidal ideation (Gosling et al., 2022), substance use (Hughes et al., 2023), depression, anxiety, self-harm, and suicidality (Inderbinen et al., 2021), mental health in Europe (Mezza et al., 2024), and mental health in the US (Valentine & Shipherd, 2018). These reviews overwhelmingly find that people who experience higher levels of distal stress are more likely to experience higher levels of proximal stress and, in turn, a higher prevalence of poor mental health, though often to a lesser extent when they report high resilience. The mental health outcomes most often considered are anxiety, depression, suicidality and self-harming behaviours, and substance use. As such, the focus of QMSR research has centred around negative mental health in a deficit-based approach. Positive mental health outcomes, such as well-being, are seldom considered (Mezza et al., 2024). Moreover, studies have predominantly utilised cross-sectional designs, meaning no temporality can be added to the underlying theoretical models. In the following, the most important QMSR dimensions identified by the literature are discussed. This also defines the scope for the current study.

Distal Stress

Distal Stress entails instances of enacted stigma, namely discrimination, rejection, victimisation, and non-affirmation (Testa et al., 2015). Discrimination relates to structural inequalities regarding access to resources such as housing, employment, health care, or public

bathrooms (Meyer, 1995). Rejection summarises experiences of exclusion, motivated by stigma, across various contexts (e.g., family, friends, communities) (Testa et al., 2015). Victimization refers to instances of harassment and assault, including verbal, physical, and sexual violence, as well as threats thereof (Meyer, 1995). Non-affirmation references instances in interactions where a person's gender identity is invalidated, purposefully or by accident. This refers to misgendering (i.e., addressing someone incorrectly with regard to their gender) and deadnaming (i.e., addressing someone using a name other than their preferred name) (Testa et al., 2015). These distal stress dimensions share high degrees of similarity across different minority groups (Jackson et al., 2021). However, confrontation with them may depend on the specific conceptualisation and definition. For example, whilst many derogatory slurs exist for various identities, queer people are not equally likely to encounter all. Moreover, dimensions like non-affirmation may be more relevant for people with novel chosen names and/or pronouns than those with more common ones (Expósito-Campos et al., 2023). Overall, distal stress entails objectively observable instances of enacted stigma and prejudice events, encountered because of minority identity group membership.

Proximal Stress

The most relevant proximal stress dimensions are internalisations of cis-/heterosexist beliefs (hereafter 'queerphobia'), identity concealment, and negative expectations of the future (Testa et al., 2015). Internalised queerphobia describes negative internal schema and beliefs relating to queer minority identity group membership (Bockting et al., 2020; Stein et al., 2023; Testa et al., 2015). This may manifest as directed towards the self and/or towards others. Towards the self, this includes negative self-evaluations and esteem (e.g., feeling disgusting for being gay). Towards others, this includes negative evaluations of queer identities, expressions, and/or behaviours (e.g., disliking seeing two men kiss). In the current study, internalised queerphobia was conceptualised as self-directed. Negative expectations denote the belief that distal stressor events will occur in the future, specifically due to the individual's queer minority identity and/or expression (Testa et al., 2015). As such, adverse outcomes are anticipated because of minority identity group membership. Identity concealment summarises action taken to hide one's queer minority identity (Meyer, 1995). Furthermore, it refers to increasing one's conformance with cis-hetero normative assumptions in behaviour, communication, and expression (Testa et al., 2015). This can also be understood under the concept of 'passing', meaning achieving levels of cis-hetero conformance high enough for most people to not recognise an individual as a queer minority

(Meidlinger & Hope, 2014; Testa et al., 2015). Here, it is important to note that the degree to which identity concealment is possible varies across individuals and the intersections of their identities (Frible et al., 1998; Meidlinger & Hope, 2014). To illustrate, a masculine gay man electing not to disclose his homosexuality may find identity concealment more possible than a transgender woman who recently started social transition and displays physical features traditionally associated with masculine bodies, or a BIPOC trying to conceal their ethnicity (Frible et al., 1998). Furthermore, differences exist in the form identity concealment takes. Continuing the example, it is possible that both the gay man and transgender woman elect to present in masculine ways. Whilst this may be affirming for the man, the woman would likely feel distressed as her gender identity and expression become incongruent (Meidlinger & Hope, 2014). Contrastingly, a transgender woman concealing her transgender identity and presenting and/or passing as a cisgender woman may find the experience affirming (Testa et al., 2015). Therefore, identity concealment may have both adverse and positive associations. Mezza et al. (2024) note that the felt need to conceal one's identity may induce experiences of internal stress. However, it may also reduce exposure to external, distal stressors. Overall, identity concealment carries significant nuances to be considered when interpreting it and its associations with other QMSR dimensions and mental health. In the current study, it was conceptualised as the concealment of queerness as a conforming effort to cis-hetero normative expectations.

Resilience Factors

Resilience factors summarise coping resources and social support, available through minority identity group membership, across individual and community levels (Gosling et al., 2022). The two factors most relevant for queer people are pride and community connectedness. Pride refers to positive self-schema, derived from queer minority identity membership (Meyer, 2015). It emphasizes seeking and deriving joy, dignity, and happiness from a valued identity. Community connectedness is connected to pride and denotes positive social relatedness and belongingness with other queer people and derived social resources (Bockting et al., 2013). This kinship is available through shared experiences and intersecting identities (Jackson et al., 2021). Community connectedness has received much attention in the literature (Barr et al., 2016; Kosciw et al., 2015; Stanton et al., 2017; Wall et al., 2022; Woodrum et al., 2021). Members of minority groups are able to affirm each other's experiences and identities, contributing to feelings of normalcy despite experiences of stigma by majority groups. This can take many forms, including spending time with queer people,

engaging in activism, and feeling represented in the physical world. Such peer-support is a critical coping resource as it not only offers social support, a key coping resource for stress, but also offers it specifically within the context of minority identity group membership (Barr et al., 2016). As such, it is most relevant for coping with queer minority stress, mental health, and well-being. In the current study, community connectedness was conceptualised as event-based, referencing specific instances of relatedness, belongingness, and feeling represented.

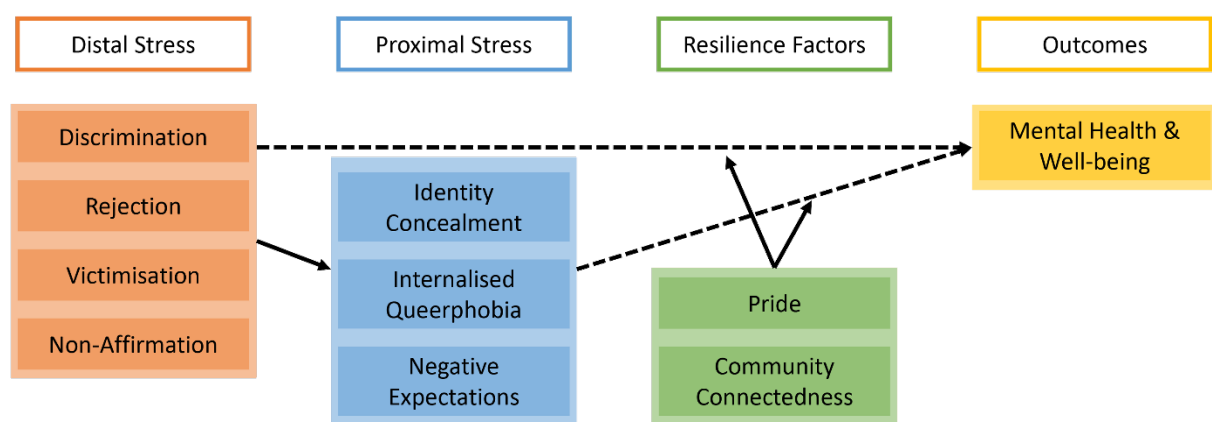
In sum, the most relevant dimensions of QMSR identified in the literature are the distal stressors of discrimination, rejection, victimisation, and non-affirmation; the proximal stressors of internalised queerphobia, identity concealment, and negative expectations; and the resilience factors of pride and community connectedness. Figure 1 illustrates the QMSR framework, the relevant assumed relationships, and the identified dimensions as applied in the current study.

Queer Minority Stress and Resilience in Everyday Life

Previous studies have also investigated QMSR constructs through ecological momentary assessment (EMA) in order to assess QMSR in naturalistic environments and investigate temporality (Livingston et al., 2017). EMA is a data collection methodology suited to examine within-, and between-person covariances of transient phenomena by using repeated sampling of data throughout the daily lives of participants (Liao et al., 2016).

Figure 1:

Framework of Queer Minority Stress and Resilience processes



Note. Processes of queer specific minority stress and resilience. Dashed lines denote inverse relationships.

Such continuous assessment allows for small variations and trends in the data to be detected. Additionally, issues with recall are avoided and the ecological validity of results increased by measuring phenomena close to where they occur (Liao et al., 2016). Moreover, EMA can be used to establish causality⁴ and temporality between psychological constructs (Livingston et al., 2017). Therefore, EMA enables a deeper exploration of constructs and how they are experienced by people, as opposed to assessing only differences between people's average experiences at one point in time. Six recent studies were identified that investigate associations between QMSR constructs and health outcomes (Dyar et al., 2022; Livingston et al., 2017, 2020; Mereish et al., 2022; Panza et al., 2021; Williams et al., 2022). Overall, these studies demonstrate evidence in favour of the theoretical assumptions of QMSR models.

First, four studies have centred around distal stress in queer samples. Livingston et al. (2017) found distal stress events to predict odds-ratios of 3 for nicotine usage and 3.6 for alcohol or other substance usage at subsequent measurements. Robust predictive power of distal stress for momentary increases in anxious and depressed mood was also demonstrated in the same sample (Livingston et al., 2020; Newberger et al., 2022). Dyar et al. (2022) similarly demonstrate predictive power of distal stress leading to more sessions of cannabis use, longer intoxication, higher subjective intoxication, and more adverse consequences compared to cannabis use without preceding distal stress events. They further conclude that these minority stress processes unfold on the event level and do not require accumulation over time to be observable. Mereish et al. (2022) found both between-, and within-person associations of distal stress with greater probability of nicotine usage. On the within-person level, these were mediated by nicotine craving and positive affect. Relevant limitations to these studies are the consideration of only distal and not proximal stress, and the non-assessment of resilience factors. Additionally, mental health and well-being were not comprehensively assessed as the outcomes focussed on substance use behaviours. As a result, these studies allow for valuable but limited insight into the various connections between QMSR constructs, mental health, and well-being.

Second, two studies have considered dimensions of proximal stress. Panza et al. (2021) found robust associations of internalised queerphobia and identity concealment at baseline predicting more cumulative episodes of dysregulated eating during subsequent EMA assessment. In their sample, lifetime distal stress experiences did not have a significant

⁴ Observational EMA studies, however, are limited to inferences about temporality through within-person associations. The robust establishment of causality, such as in Granger-causal processes, requires additional considerations for experimental control. Please refer to Shojaie & Fox, 2021 for a review.

predictive power. The study lends moderate support for QMSR frameworks, as minority stress was not assessed during EMA and no mediation or moderation paths were considered. Williams et al. (2022) have published a study on the feasibility and acceptability of EMA in a queer sample, including measures of distal and proximal stress. However, they have not conducted analyses using this data, meaning no conclusions can be made regarding QMSR processes or evidence. As such, no comprehensive assessment of daily proximal stress has been conducted in the identified studies applying EMA in queer populations.

Overall, the research to date has failed to deliver a holistic exploration of QMSR processes in everyday life, using EMA. Distal stress has been the most considered construct, demonstrating robust predictive associations with outcomes of interest. Proximal stress has received less attention and conclusions about relevant processes in everyday life cannot yet be made. Resilience factors have not yet been included in the identified EMA studies. Finally, the health outcomes investigated have largely been behavioural, constraining insights into mental health and well-being.

Purpose of the Current Study

The current study was designed as a broad exploration of within-person associations between minority stress, resilience, mental health, and well-being in queer people using EMA. An instrument was constructed with queer people for this purpose in a previous study (Behrens & Dekkers, 2023). This was applied to explore the daily (co-) variation of QMSR constructs in a sample of queer people. The current study aims to address several limitations in the contemporary literature and propose guidance for future, similar investigations. First, cross-sectional research does not allow for the investigation of within-person associations between constructs, meaning no temporal inferences can be drawn. Second, previous EMA studies have focussed on important, but few QMSR dimensions, failing to deliver holistic perspectives. Third, the health outcomes most commonly considered provide a deficit-based understanding of health, both in cross-sectional and EMA studies. Two research questions (RQ) guide this study:

1. To what extent is there daily variation in QMSR processes, mental health, and well-being on the within-person level?
2. To what extent is daily variation in mental health and well-being associated with QMSR processes on the within-person level?

Methodology

Design

An EMA design was identified as the most appropriate to use in the current study to investigate momentary queer minority stress and resilience processes and momentary mental health⁵. The study was reviewed and approved by the BMS ethical committee / Domain Humanities & Social Sciences at the University of Twente under request #231320. The set-up and format of the EMA data collection was initially based on Myin-Germeys & Kuppens (2022) and further informed by studies investigating queer minority stress and resilience processes through EMA, identified in a previous study, and described above. Specifically, these previous EMA studies informed the prompt design as relating to frequency, length, answering modalities, and which types of questions would be appropriate to assess the various constructs of interest. Illustrative of this, two answering modalities (event-checklist, 100-point visual analogue scale) were used successively and separately to reduce participant burden (Myin-Germeys & Kuppens, 2022). Questions also appeared in the same order each prompt. Finally, a 50€ incentive was provided to enhance adherence. For this, each completed survey was entered into a raffle pool, meaning that a higher response rate (% of surveys completed) increased the participants chance to win. Only participants who complete the study were eligible: completing the baseline & follow-up surveys and being active on at least 12 out of 14 days. The winning participant (ID 10) received the prize money approximately three weeks after data collection concluded.

Participants

The inclusion criteria for the study are/were: 1) being queer (i.e., a sexual and/or gender minority), 2) being between 18 and 35 years old, and 3) being proficient in English⁶. Additionally, participants had to respond to a minimum of 10% of surveys. In general, participants who respond to fewer surveys may only respond when it is convenient or when exceptional circumstances occur (Myin-Germeys & Kuppens, 2022). This may introduce bias to the data and subsequent analyses. Whilst 60% to 80% are suggested as minimum response rates in the literature, the explorative nature of current study justified a lower cut-off point for inclusion. The final sample ranged between ages 19 and 30 ($M_{\text{age}} = 22.86$, $SD_{\text{age}} = 3.18$). Most

⁵ The reporting of the EMA protocol follows the Checklist for Reporting EMA Studies (CREMAS; Liao et al., 2016).

⁶ A CONSORT Flowchart for participant selection can be found in the [supplementary materials](#).

resided in the Netherlands at the time of the study and were part of a queer association. No one identified their sexuality as heterosexual and a minority identified as cisgender. Full demographic characteristics of the final sample are available in Table 1.

Table 1:*Demographic characteristics*

Demographic	N	%
Country of residence		
German	2	9.1
Netherlands	20	90.9
Sex assigned at birth		
Male	6	27.3
Female	16	72.7
Intersex	0	0
Gender identity label*		
Non-binary	7	31.8
Transgender	4	18.2
Woman	7	31.8
Man	8	36.4
Agender	1	4.5
Demigender	1	4.5
Questioning	3	13.6
Cisgender	6	27.3
Sexual identity label*		
Queer	6	27.3
Pansexual / Bisexual	12	54.5
Lesbian	4	18.2
Gay	3	13.6
Aromantic/Asexual	1	4.5
Demisexual	3	13.6
Association membership*		
J&SV Exaltio	10	45.5
S.V. QUEER!	4	18.2
Th!nk with Pride	4	18.2
COC	1	4.5
Pink Pearl NL	1	4.5

Note: * denotes choices where multiple options could be selected

Procedure

Participants were recruited through convenience sampling via the WhatsApp group chats of LGBTQIA+ associations, namely J&SV Exaltio, S.V. QUEER!, and Th!nk with Pride UT, and through the informal network of the primary researcher. Participants were initially directed to a landing page for the study, outlining the activities of the study, informing them about how to participate, and offering a short instructional video (<https://cosoc.com/queer>). Participants were then presented with a short video to introduce them to the study platform, help them with registering, and how to complete both the baseline assessment and daily surveys as training for the EMA protocol. They were also informed about how many surveys they would receive per day and in total. Data collection succeeded through the University of Twente's 'Twente Intervention and Interaction Machine' (TIIM) platform. Participants installed this as a mobile app on their personal phones running either iOS or Android. Once registering with the TIIM app, participants added the study to their dashboard by entering a code provided previously. Participants were then fully informed about all aspects of the study and asked to provide their informed consent (Appendix 1). Next, they proceeded through demographic data collection (age, country of residence, sexuality, gender assigned at birth, gender identity, affiliation with LGBTQIA+ associations) which was followed by the baseline assessment. Subsequently, the EMA data collection took place. The study utilised one wave of data collection spanning 14 days, from 16.11.2023 to 29.11.2023. The 14 days were continuous, and no changes were made between weekdays vs. weekends. Prompts were sent five times per day and used a fixed three-hour interval-based strategy. In total, 70 prompts were scheduled. They were sent out at 10:00, 13:00, 16:00, 19:00, and 22:00, each prompt being available for 1 hour with an initial notification and a reminder 30 minutes before closing. After the final EMA survey closed, the follow-up assessment became available for participants to complete. This concluded the study.

Materials

Baseline assessment

The baseline assessment consisted of the Gender Minority Stress and Resilience Scale (GMSR; Testa et al., 2015), the Generalised Anxiety Disorder 7 (GAD-7; Spitzer et al., 2006), the Patient Health Questionnaire 9 (PHQ-9; Manea et al., 2015), the Mental Health Continuum Short Form (MHC-SF; Lamers et al., 2011), the Nebraska Outness Scale (NOS; Meidlinger & Hope, 2014), and the Multidimensional Scale of Perceived Social Support

(MSPSS; Zimet et al., 1988). These were used to infer average sample characteristics at the beginning of the study. An overview of the instruments and corresponding constructs is available in Table 2.

EMA Instruments

Each prompt delivered to participants included two event-based checklist items, twelve 100-point visual analogue scale (VAS) items, and was intended to be completed in under five minutes.

Table 2:

Baseline Assessment.

Instrument	Construct	Number of items	Range
GMSR	Minority stress and resilience	58	0 – 211
	Lifetime Discrimination	5	0 – 15
	Lifetime Rejection	6	0 – 18
	Lifetime Victimization	6	0 – 18
	Non-Affirmation	6	0 – 25
	Internalised Queerphobia	8	0 – 32
	Identity Concealment	5	0 – 20
	Negative Expectations	9	0 – 36
	Pride	8	0 – 32
	Community Connectedness	5	0 – 20
GAD-7	Anxiety	7	0 – 21
PHQ-9	Depression	9	0 – 27
MHC-SF	Well-being	14	0 – 5
	Emotional Well-being	3	0 – 5
	Psychological Well-being	6	0 – 5
	Social Well-being	5	0 – 5
NOS	Outness	10	0 – 100
	Disclosure	5	0 – 100
	Concealment	5	0 – 100
MPSSS	Perceived social support	12	0 – 84
	Significant Other	4	0 – 28
	Family	4	0 – 28
	Friends	4	0 – 28

Note: More information about the instruments applied at baseline and their psychometric properties is available in the [supplementary materials](#).

QMSRS. The Queer Minority Stress and Resilience Scale (QMSRS; Behrens & Dekkers, 2023) is a brief scale designed to assess queer minority stress and resilience processes as identified by Meyer (1995) and Testa et al. (2015). It was initially developed, face validated, and adjusted accordingly in a previous pilot study together with a queer advisory group. The items and structure were based on the GMSR instrument by Testa et al. (2015). This was combined with the measurement approaches taken by previous studies investigating queer minority stress and resilience using EMA to construct an instrument appropriate for use in brief surveys (e.g., Dyar et al., 2022; Williams et al., 2022). A draft instrument was scrutinised by six queer participants across multiple rounds of cognitive interviewing. Their feedback was integrated to improve each item in readability, clarity, consistency, feasibility, and relevance. The final instrument consisted of seven questions across 23 items covering nine scales. Distal stress was assessed first. Here, participants indicated which, if any, of 13 enacted stigma events had occurred since the last survey, or in the last 2-3 hours, whichever denotes the smaller interval. Two participants elected to describe a negative event in their own words (“I discussed the Dutch trans health care system with friends”; “Dutch election outcomes are downright xenophobic right-wing Conservative”) which could not be clearly identified as distal stress events and, thus, the responses were omitted. Next, five community connectedness events were assessed, using same answering instructions as before. A fill-in option was also available but not used. These events were conceptualised as counters, meaning that each type of event endorsed would add one (1) without weighing. The next section of the instrument assessed proximal stressor dimensions through one item each and pride through two items. These were measured by 100-point VAS, ranging from 0 - fully disagree, to 100 - fully agree. An overview of the QMSRS instrument is presented in Appendix 2.

PHQ-4 (Anxiety & Depression). The PHQ-4 (Löwe et al., 2010) was used in the survey to assess momentary anxiety and depression. It has been shown to strongly correlate with the GAD-7 (0.81) and PHQ-9 (0.84) and combines the two items with the highest factor loadings of each instrument (Löwe et al., 2010). As before, visual analogue scales were used as the answering modality, ranging from 0 - not at all, to 100 - extremely, referencing how much participants had been ‘bothered by problems since the last survey’. The items for anxiety were: ‘feeling nervous, anxious or on edge’ and ‘not being able to stop or control worrying’. The items for depression were: ‘feeling down, depressed or hopeless’ and ‘little interest or pleasure in doing things’.

MHC-SF (Positive well-being). The EMA survey concluded with three items from

the MHC-SF which assessed positive well-being. The items were chosen as they showed the highest factor loadings for their respective sub-scale (Lamers et al., 2011), similarly to the PHQ-4. Participants indicated the extent to which they had felt a specific way since the last survey, again along 100-point visual analogue scales, ranging from 0 - not at all, to 100 - extremely. Emotional well-being was denoted by feeling: 'satisfied with life'; psychological well-being by feeling: 'confident to think or express your own ideas and opinions'; and social well-being by feeling: 'that our society is becoming a better place for people'.

Data Analysis

RQ 1: To what extent is there variation in queer minority stress and resilience processes and mental health on the within-person level?

To assess the first RQ, the intraclass correlation coefficients (ICC) of the relevant constructs were examined. The ICC indicates the extent to which variance of a construct is due to between-person differences, ranging from 0 to 1 (Myin-Germeys & Kuppens, 2022). A high ICC (0.75 – 1) indicates that most variance is explained by stable between-person differences, a low ICC (0 – 0.25) indicates that most variance is explained by time-varying within-person differences, and a moderate ICC (0.25 – 0.75) indicates that there is a balance in between-, and within-person variation. Further, the ICC informs the interpretability of CPA in EMA, as higher ICCs suggest that differences in a construct may be better explained by between-person differences than within-person differences.

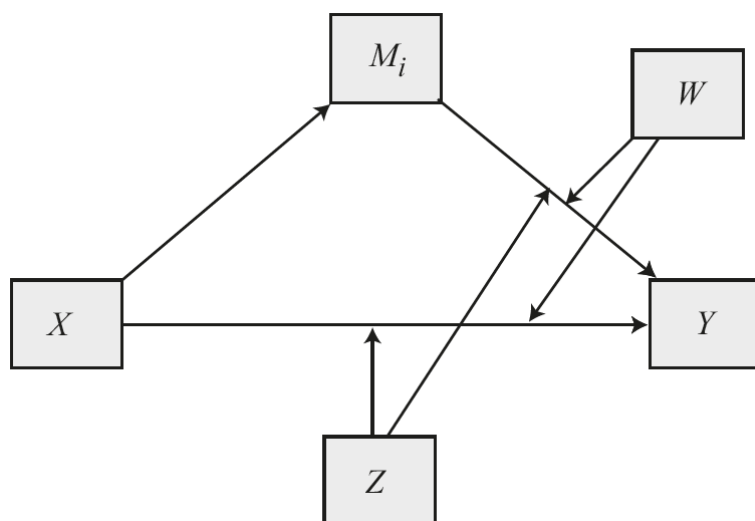
RQ 2: To what extent is mental health associated with queer minority stress and resilience processes on the within-person level?

To answer the second RQ, conditional process analysis (CPA) was identified as the most appropriate approach, specifically multilevel CPA⁷ (Livingston et al., 2016; Montoya, 2023). This combines hierarchical linear modelling and moderated mediation analysis. In this study, it was applied to investigate associations between within-person processes of queer minority stress and resilience and mental health. The model follows the theoretical assumptions of QMSR processes as described before and is represented by PROCESS Model 17 by Hayes (2022), visualised in Figure 2. All predictors were person-mean centred standardised (P-S), meaning all data points represented a momentary experience relative to each participants own average and variation in each construct (Wang et al., 2019).

⁷ Further details and considerations for the data analysis can be found in the [supplementary materials](#).

Figure 2

Conditional process model 17 by Hayes (2022).



Note. X is distal stress; Y are outcomes; M_i are proximal stressors; Z and W are resilience factors. Figure 1 also represents these relationships.

In addition to CPA, visual analyses of time-series graphs were conducted. This was supplementary to CPA and designed to aid the interpretation of results, as well as offer insight into the lived experience of participants. Overall, the CPA and visual analyses allowed for a broad exploration of within-person associations between minority stress, resilience, mental health, and well-being in the current study.

R Packages

‘esmpack’. The R package *esmpack* by Viechtbauer (2023), which is a ‘collection of functions that facilitate preparation, management, visualization, and analysis of data collected via ecological momentary assessment (EMA)’ was used to prepare the data for analysis.

‘bruceR’. To conduct the CPA⁸, the ‘BRoadly Useful Convenient and Efficient R functions that BRing Users Concise and Elegant R data analyses’ (*bruceR*) package function ‘PROCESS’ by Bao 包寒吴霜 (2021) was used. Internally, *bruceR* uses the packages ‘mediation’ (Tingley et al., 2014), ‘interactions’ (Long, 2019), and ‘lavaan’ (Rosseel, 2012), ‘lmerTest’ (Kuznetsova et al., 2017) to manage linear mixed models. At the time of writing,

⁸ An annotated description of the code used to run the conditional process analysis is available in the [supplementary materials](#).

the 'bruceR' package supports 24 'PROCESS' models as proposed by Hayes and supports multilevel mediation moderation analyses as described by Rockwood et al. (2017).

Results

Adherence & Attrition

32 participants initially signed up to participate in the study and completed the baseline assessment. Three participants never started the EMA part of the study, dropping out after the baseline assessment. Of the remaining participants, 22 completed more than 10% of surveys and, thus, met the inclusion criteria. After excluding ineligible participants, the average compliance rate was 52.5% (SD= 29.6, [12.9 - 98.6]), or 808 of 1540 surveys. Individual attrition and compliance rates for participants may be appreciated in Appendix 3.

Three participants (7, 14, and 18) logged no distal stress events. Due to these zero variances, their distal stress P-S scores returned a missing value. As a result, these participants were excluded from CPA. Elsewhere, their data remained included. All surveys were internally complete and provided a full set of data points⁹. Missing surveys were deleted listwise in all analyses. No data imputation method was employed to compensate for missing data.

Data Model & Analysis

Descriptive Analysis

On average, participants indicated moderate anxiety, depression, and well-being. Participants were open about their queer identity to, and concealed it from around half of their social environment. Further, participants indicated high perceived social support overall. Table 3 hosts an overview of the baseline assessment¹⁰. Next, Table 4 shows the EMA survey and each assessed construct in the current sample across all surveys. Participants appear to have had a high chance of encountering distal stress and community connectedness events. The mean values here indicate the average number of events logged per survey, across all surveys, across the full sample. Further, it was notable that average pride was significantly higher than any proximal stressor.

⁹ More information about missing data and the EMA technology can be found in the [supplementary materials](#).

¹⁰ More detailed individual participant mean and CI plots are available in the [supplementary materials](#).

Table 3:*Participants' minority stress, resilience, and mental health at baseline*

Instrument	Subscale	Sample Mean	Sample SD	Sample Range	Possible range	
GMSR	Overall	105.68	25.43	59 – 150	0 – 211	
	Lifetime Discrimination	6.05	1.40	5 – 10	0 – 15	
	Lifetime Rejection	8.41	2.82	6 – 16	0 – 18	
	Lifetime Victimization	7.14	1.55	6 – 12	0 – 18	
	Non-Affirmation	13.95	6.63	2 – 24	0 – 25	
	Internalised Queerphobia	9.45	8.82	0 – 30	0 – 32	
	Identity Concealment	7.82	5.99	0 – 20	0 – 20	
	Negative Expectations	15	8.47	3 – 29	0 – 36	
	Pride	22.59	7.14	8 – 32	0 – 32	
	Community Connectedness	15.27	4.61	5 – 20	0 – 20	
	GAD-7	Anxiety	9.32	6.15	1 – 20	0 – 21
	PHQ-9	Depression	10.23	7.26	0 – 25	0 – 27
	MHC-SF	Overall	2.66	0.83	0.86 – 4.21	0 – 5
		Emotional Well-being	3.30	1.00	1.33 – 4.66	0 – 5
Psychological Well-being		2.89	1.07	0.67 – 4.83	0 – 5	
Social Well-being		2.01	0.75	0.40 – 3.40	0 – 5	
NOS	Overall	51.55	20.64	6 – 85	0 – 100	
	Disclosure	52.18	22.24	12 – 100	0 – 100	
	Concealment	49.09	26.39	12 – 82	0 – 100	
MPSSS	Overall	61.81	15.95	30 – 84	0 – 84	
	Significant Other	21.32	7.80	5 – 28	0 – 28	
	Family	16.64	7.80	4 – 28	0 – 28	
	Friends	23.82	5.03	7 – 28	0 – 28	

Table 4:*Construct sample mean and standard deviation of the EMA survey.*

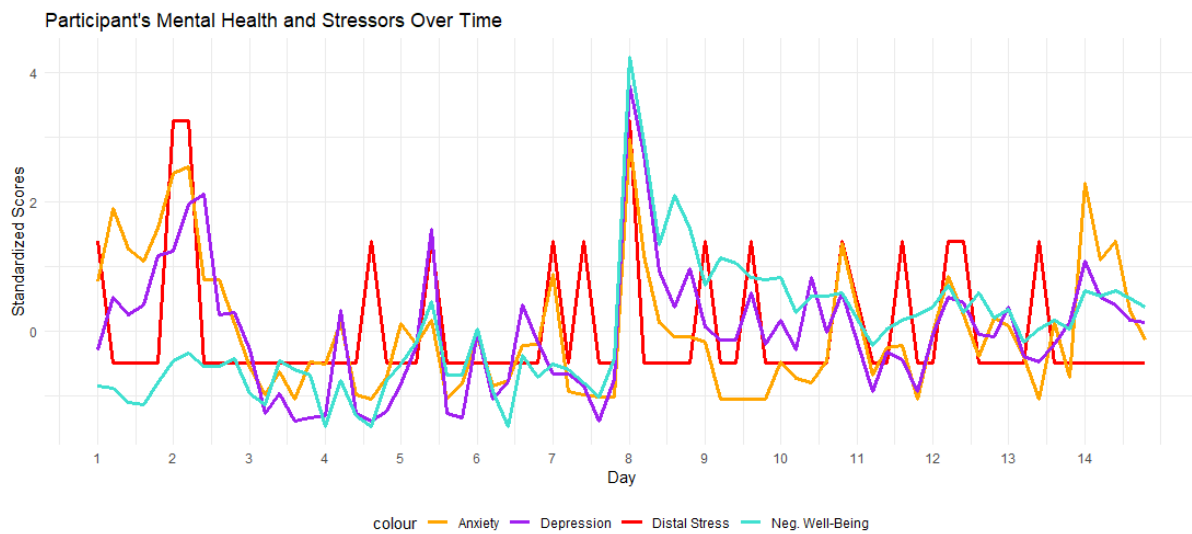
Construct	Sample Mean	Sample SD
Anxiety	27.99	5.45
Depression	27.15	5.59
Well-Being (R)*	47.86	3.81
Identity Concealment	25.04	5.34
Internalised Queerphobia	15.78	4.11
Negative Expectations	26.05	4.19
Pride	59.41	5.18
Distal Stress	0.39	0.08
Community Connectedness	1.55	0.28

Note: * Reversed score so higher scores indicate negative well-being.

Across the EMA period, observable events of enacted stigma and community connectedness were assessed¹¹. 19 participants indicated that they had encountered distal stress across a total of 248 events in 163 surveys. When experiencing distal stress, an average of 1.52 events were encountered and there was a 20.15% chance for any survey to indicate enacted stigma. All participants logged community connectedness events. They reported a total of 1116 positive events across 447 surveys, with an average of 2.5 events per survey. There was a 55.25% chance for any completed survey to indicate some positive event(s).

Finally, the data was visualised in time-series graphs. The first visualisation of data concerns the correlations between distal stress and mental health and well-being. Figure 3 illustrates these across a single participant (ID 26). This case data was selected because it fit the model well, as shown by the co-occurring peaks, carried a high number of data points, and indicated multiple distal stress events. Especially the centre of the graph is notable (beep 36), denoting the highest peak for all variables. This occurred around the time of the Dutch general elections, which saw a right-wing populist majority elected. Another observation is that peaks in distal stress vary regarding which, if any, mental health outcome shows an increase around the same time. This suggests that different types of distal stress affect mental health and well-being in different ways, but that distal stress consistently predicted increased anxiety, depression, and negative well-being.

¹¹ More detailed information about the relative frequency of events and individual event reporting can be found in the [supplementary materials](#).

Figure 3*Participant case data: Distal stress and mental health over time*

Next, Figure 4 illustrates a single participants (ID 25) distal and proximal stress over time. This case data was also chosen for good model fit, high number of data points, and presence of distal stress. As before, clear co-occurrence of peaks could be observed, now between distal and proximal stress. Furthermore, there were observable differences in which, if any, proximal stressor(s) peak together with reports of distal stress. This suggests some variability in the associations of different distal stress events. Assessments that followed peaks also commonly saw proximal stress return to lower levels, suggesting that such stress was indeed momentary in nature. Overall, these findings fit the theoretical assumptions of QMSR frameworks well.

Finally, by plotting distal and proximal stress and mental health and well-being outcomes, indirect effects can be illustrated. Figure 5 shows the data of participant 25 (*as in Figure 4*). Both proximal stress and mental health and well-being could be observed to vary across time and independently from distal stress. However, with the exception of beep 50, all distal stress peaks are clearly associated with distinct peaks in the other constructs. As such, distal stress appeared to be highly predictive of momentary increases in proximal stress, anxiety, depression, and negative well-being. However, which one of these constructs may peak with distal stress appeared to fluctuate over time. Thus, whilst proximal stress and mental health and well-being demonstrated patterns of occurrence alongside distal stress, the specific nature and makeup of these associations was ambiguous.

Figure 4

Participant case data: Distal and proximal stress over time

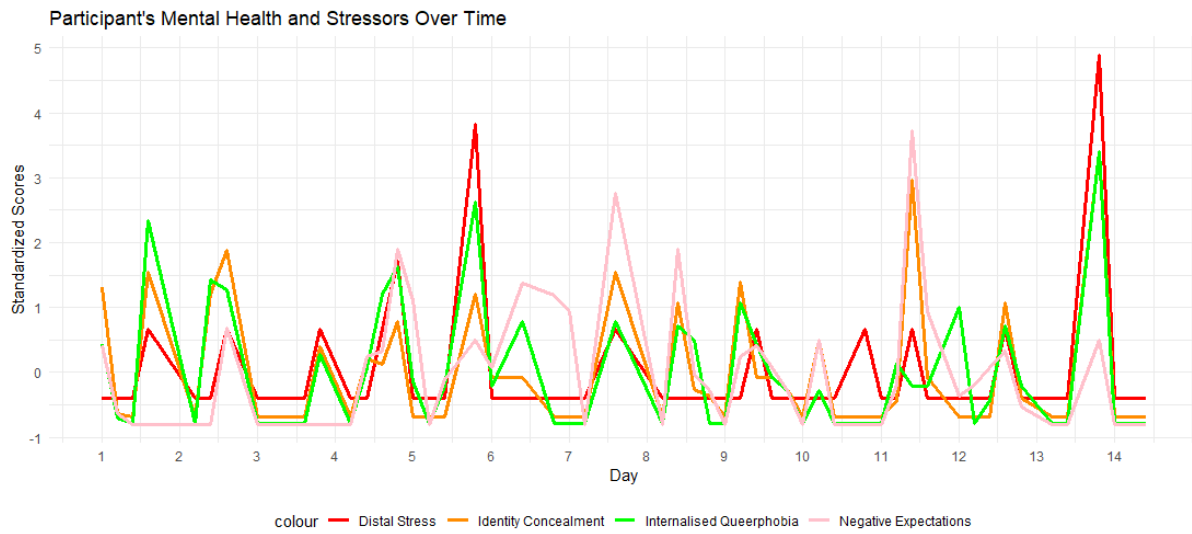
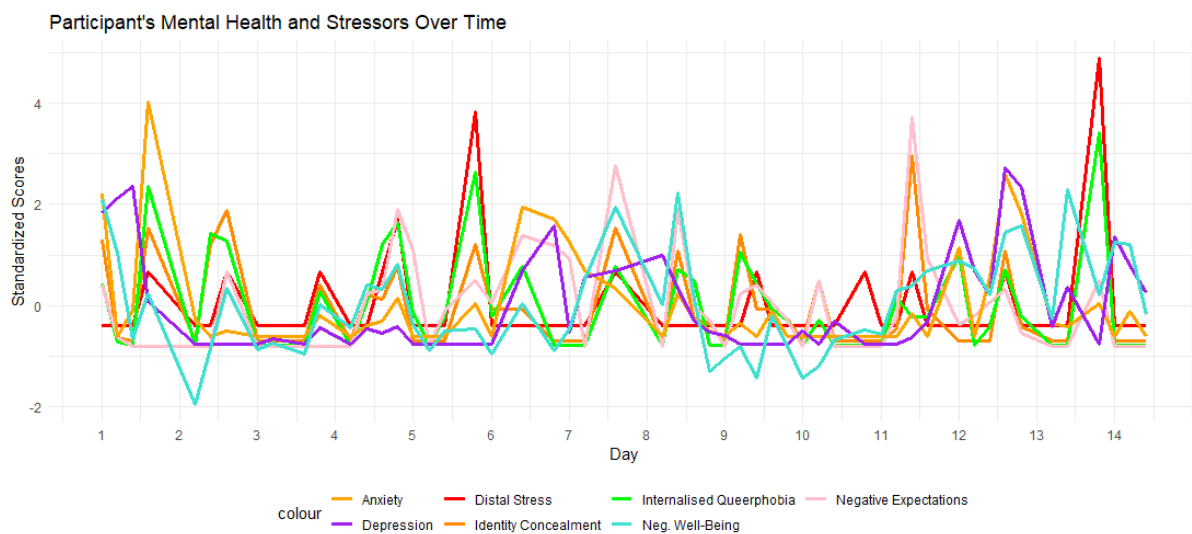


Figure 5

Participant case data: Distal and proximal stress and mental health over time (beep)



RQ 1: To what extent is there variation in queer minority stress and resilience processes and mental health on the within-person level?

In the current study, ICC values for the outcomes (i.e., anxiety, depression, well-being) indicate that the majority of variance was better accounted for by between-person differences. The same was true for proximal stress (i.e., identity concealment, internalised

queerphobia, negative expectations) and pride. Whilst within-person variance exists and reflects the lived experience of each participant, differences in the average experiences of these constructs may be more pronounced and important for individual experiences overall. Distal stress had a low ICC, suggesting that within-person differences were more relevant for the observed variation than between-person. Lastly, community connectedness was balanced in between-, and within-person variance. Exact values are available in Table 5.

RQ 2: To what extent is mental health associated with queer minority stress and resilience processes on the within-person level?

To answer the second RQ, the direct effects of distal stress on mental health outcomes are reported first. Following this, the full model is reported for each outcome, consisting of the main effects of queer minority stress and resilience constructs and the relevant interaction effects. Finally, the conditional indirect effects of distal stress over proximal stress on mental health as dependent on resilience factors are reported for each outcome. For these conditional indirect effects, resilience factors were divided into low, average, and high conditions. Each participant has data points associated with higher or lower resilience depending on their own average due to the P-S approach. Therefore, all conditions include all participants and not only those who, compared to the sample mean, were higher or lower in resilience.

Table 5

Intraclass correlation coefficients (ICC)

Construct	ICC
Anxiety	0.743
Depression	0.767
Well-being	0.784
Identity concealment	0.865
Internalised queerphobia	0.819
Negative expectations	0.786
Pride	0.854
Distal stress	0.178
Community connectedness	0.446

Distal stress: direct effects. When examining only the main effect of distal stress, it significantly predicted momentary increases in anxiety ($b = 2.533$, $CI = [1.475; 3.591]$, $p < 0.001$), depression ($b = 1.344$, $CI = [0.319; 2.369]$, $p < 0.05$), and negative well-being ($b = 0.639$, $CI = [0.001; 1.268]$, $p < 0.05$) on the within-person level.

Anxiety: main effects. Distal stress was not significantly associated with anxiety when entering all predictors and their interaction terms in the full model. Anxiety significantly correlated with higher internalised queerphobia and negative expectations, but not identity concealment. Higher pride was also significantly associated with lower anxiety, but community connectedness was not. Two main interaction terms were significant, which were conceptualised in line with the theoretical assumptions of QMSR frameworks. Pride with identity concealment was correlated with higher anxiety, suggesting an exacerbating pattern. As such, the association between identity concealment and increased anxiety was greater when pride was also high. Contrastingly, pride with internalised queerphobia correlated with lower anxiety. Thus, association between internalised queerphobia and increased anxiety were inhibited when pride was also high, suggesting a protective function. The marginal R^2 was low, indicating that little variance was explained by within-person fixed effects. The conditional R^2 was high, indicating that additional variance could be explained by between-person slope differences in fixed effects. Table 6 displays all relevant statistics.

Table 6

Anxiety: main effect regression coefficients

Predictor	b	95% CI lower	95% CI upper
Distal Stress	0.740	-0.406	1.886
Identity Concealment	0.520	-0.759	1.799
Internalised queerphobia	2.757***	1.162	3.898
Negative expectations	1.876**	0.720	3.032
Community Connectedness	0.392	-0.684	1.672
Pride	-2.072***	-3.238	-0.906
Pride x Identity Concealment	0.915*	0.023	1.807
Pride x Internalised Queerphobia	-0.940*	-1.748	-0.132
Marginal $R^2 = 0.037$			
Conditional $R^2 = 0.785$			

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Depression: main effects. In the full model, the effect of distal stress on depression was not statistically significant. Out of the proximal stressors, higher internalised queerphobia and negative expectations were associated with increased depression. Of the resilience factors, pride was significantly associated with lower depression. Three interaction effects were indicated to be significant. As before, the conceptualisation of these follows the theoretical assumptions of QMSR frameworks. Both community connectedness and pride significantly interacted with identity concealment. Here, higher identity concealment was associated with greater depression at higher community connectedness and pride. Thus, these protective resilience factors instead exacerbated the association of identity concealment with higher depression. Third, community connectedness with internalised queerphobia. Community connectedness was protective as the associations between higher internalised queerphobia and increased depression were inhibited by high community connectedness. The marginal R² indicated little explanatory power for fixed effects and the conditional R² suggested that between-person differences in the fixed effect slopes could account for more variance. An overview of these statistics is available in Table 7.

Table 7*Depression: main effect regression coefficients*

Predictor	b	95% CI lower	95% CI upper
Distal Stress	0.248	-1.092	1.589
Identity Concealment	-1.061	-2.199	0.077
Internalised queerphobia	3.108***	2.011	4.206
Negative expectations	1.427*	0.314	2.540
Community Connectedness	-0.135	-1.211	0.941
Pride	-3.579***	-4.702	-2.456
Community Connectedness x Identity Concealment	1.750*	0.713	2.787
Pride x Identity Concealment	1.123*	0.265	1.981
Community Connectedness x Internalised Queerphobia	-1.419*	-2.277	-0.560
Marginal R ² = 0.036			
Conditional R ² = 0.781			

Note: * p < 0.05, ** p < 0.01, *** p < 0.001.

Well-being: main effects. Distal stress was not significantly predictive of well-being in the full model. Both internalised queerphobia and negative expectations were significantly predictive of lower well-being. Associations between pride and higher well-being were also significant. Community connectedness and identity concealment showed no significant correlation with well-being, nor did any interaction terms. Note that well-being was reverse scored in analyses to be in line with the other outcomes, meaning higher scores denoted lower well-being. This model also carries the lowest marginal R² and highest conditional R². This indicates that fixed effects explained little variation and individual differences in their slopes could explain more variance. This difference was greater for well-being than for the other outcomes. A summary of these statistics may be appreciated in Table 8.

Anxiety: conditional indirect effects. Distal stress significantly predicted higher anxiety through higher identity concealment specifically when pride and community connectedness were also high. These results suggest that the concealment of a valued identity is associated with more anxiety following distal stress when said value is salient. Therefore, resilience factors may not be protective in this relationship, but exacerbate it. For example, identity concealing at the same time as feeling highly proud of, and connected to a queer identity could be experienced as a mismatch between one's internal experience and external expression.

Table 8

Well-being: main effect regression coefficients

Predictor	b	95% CI lower	95% CI upper
Distal Stress	-0.076	-0.750	0.598
Identity Concealment	0.025	-1.206	1.256
Internalised queerphobia	0.781*	0.109	1.453
Negative expectations	0.803*	0.123	1.483
Community Connectedness	-0.520	-1.273	0.233
Pride	-2.656***	-3.342	-1.97
Marginal R ² = 0.027			
Conditional R ² = 0.836			

Note: * p < 0.05, ** p < 0.01, *** p < 0.001.

Next, distal stress significantly predicted higher anxiety through internalised queerphobia unless both pride and community connectedness were high. Here, the regression coefficient was largest when both were low and was reduced as the conditions changed to average and high. Internalised queerphobia as negative self-schema related to queer identity may, therefore, be in conflict with positive schema (self and other) related to queer identity. When these positive schemata are highly salient, the associations between negative schema and anxiety could not be observed in the current sample. Therefore, resilience factors could be observed as serving a protective function in these associations.

Lastly, distal stress significantly predicted higher anxiety through negative expectations when pride was low or average, but not when pride was high. As such, distal stress and subsequent expectations of future distal stress were associated with higher anxiety at lower resilience. This association was inhibited by resilience as regression coefficients were not statistically significant when pride was high. Within pride clusters, the regression coefficient was larger with higher community connectedness. Therefore, pride appeared as the more important protective factor in these associations. The conditional indirect effect statistics of distal stress on anxiety over proximal stress are available in Table 9.

Table 9

Conditional indirect effects of distal stress on anxiety through proximal stress.

Identity Concealment					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
High	High	0.625	0.288	0.030	[0.117, 1.225]
Internalised Queerphobia					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
Low	Low	0.921	0.246	<.001	[0.489, 1.452]
Low	Mean	0.766	0.206	<.001	[0.392, 1.217]
Low	High	0.605	0.230	0.009	[0.205, 1.082]
Mean	Low	0.728	0.210	<.001	[0.359, 1.161]
Mean	Mean	0.558	0.162	<.001	[0.274, 0.894]
Mean	High	0.400	0.188	0.034	[0.067, 0.802]
High	Low	0.529	0.222	0.017	[0.126, 0.987]
High	Mean	0.373	0.156	0.017	[0.100, 0.709]

Negative Expectations					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
Low	Low	0.391	0.166	0.019	[0.115, 0.759]
Low	Mean	0.448	0.168	0.008	[0.167, 0.801]
Low	High	0.487	0.209	0.020	[0.124, 0.938]
Mean	Low	0.273	0.135	0.043	[0.037, 0.570]
Mean	Mean	0.317	0.128	0.013	[0.099, 0.608]
Mean	High	0.367	0.174	0.035	[0.050, 0.709]

Note: An extended version of this Table and effect visualisations can be found in the [supplementary materials](#).

Depression: conditional indirect effects. Distal stress significantly predicted depression through identity concealment when pride was low, given that community connectedness was also low or average; and when pride was average, given that community connectedness was low. The regression coefficient was negative and largest when both were low. As was the case with anxiety, identity concealment and resilience appeared to interact differently than resilience and the other proximal stressors. In other words, identity concealment following distal stress was predictive of lower depression at low momentary resilience. Thus, low resilience was demonstrated as buffering these associations and high resilience was not. For example, concealing one's queer identity in moments when resilience was low may have facilitated reduced depression without raising inner conflict.

Distal stress significantly predicted depression through internalised queerphobia unless both pride and community connectedness were high. Again, the regression coefficients were largest when both were low and decreased in size as the conditions changed to average and high. Thus, it could be observed that these associations were buffered by higher resilience and became more pronounced at lower resilience. Especially community connectedness determined the extent of buffering as evident in the clustering of effects.

Finally, distal stress significantly predicted depression through negative expectations unless pride was high; and when pride was low while community connectedness was high. Regression coefficients for low pride were larger than those for average pride. Thus, higher resilience buffered the associations between distal stress and higher depression over higher negative expectations. At lower resilience, these associations became more pronounced. A summary of all statistics relating to the conditional indirect effects of distal stress over proximal stress on depression may be appreciated in Table 10.

Table 10*Conditional indirect effects of distal stress on depression through proximal stress.*

Identity Concealment					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
Low	Low	-0.958	0.258	<.001	[-1.497, -0.503]
Low	Mean	-0.530	0.195	0.006	[-0.939, -0.187]
Mean	Low	-0.687	0.242	0.005	[-1.180, -0.264]
Internalised Queerphobia					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
Low	Low	1.043	0.263	<.001	[0.560, 1.578]
Low	Mean	0.753	0.205	<.001	[0.409, 1.174]
Low	High	0.463	0.218	0.034	[0.099, 0.933]
Mean	Low	0.937	0.234	<.001	[0.517, 1.409]
Mean	Mean	0.634	0.165	<.001	[0.342, 0.985]
High	Low	0.848	0.246	<.001	[0.418, 1.364]
High	Mean	0.533	0.163	0.001	[0.247, 0.866]
Negative Expectations					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
Low	Low	0.357	0.164	0.030	[0.091, 0.709]
Low	Mean	0.346	0.140	0.013	[0.099, 0.648]
Mean	Mean	0.242	0.114	0.033	[0.037, 0.476]
Mean	High	0.267	0.149	0.072	[0.026, 0.554]

Note: An extended version of this Table and effect visualisations can be found in the [supplementary materials](#).

Well-being: conditional indirect effects. First, the indirect effect of distal stress on well-being through identity concealment was statistically non-significant in all conditions. Therefore, it may be concluded that well-being was not predicted by distal stress through identity concealment.

Second, distal stress significantly predicted lower well-being through internalised queerphobia when pride was average or high and community connectedness was low or average. No consistent buffering pattern could be observed here, as associations were non-significant at the lowest and highest momentary resilience. Moreover, all significant effects were marginally significant, meaning they were close to the cutoff point of $p \leq 0.05$.

Finally, distal stress significantly predicted lower well-being through negative expectations when both pride and community connectedness were either low or average. Here, resilience clearly demonstrated a buffering function as the associations with well-being only showed statistical significance at lower momentary resilience. Table 11 summarises all relevant statistics for the conditional indirect effects on well-being.

Discussion

The first research question pertained to the extent to which there is variation in QMSR processes in everyday life. The most variation in the reporting of distal stress events was found to be captured by within-person differences. Thus, experiencing enacted stigma was less a function of differences between participants and more a function of differences over time. Variation in community connectedness events was balanced in within-, and between-person differences. Thus, both differences in each participants average community connectedness, as well as their connectedness fluctuating over time were pertinent to explaining variation. For distal stress and, to a lesser extent, community connectedness, it may be the case that belonging to a queer minority group was pertinent in shaping differences between individuals (Myin-Germeys & Kuppens, 2022), which was a characteristic shared

Table 11

Conditional indirect effects of distal stress on well-being through proximal stress.

Internalised Queerphobia					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
Mean	Mean	0.163	0.075	0.031	[0.022, 0.317]
High	Low	0.244	0.125	0.050	[0.021, 0.510]
High	Mean	0.181	0.091	0.047	[0.019, 0.375]
Negative Expectations					
Pride	Community Connectedness	Effect	SD	p	MCMC 95% CI
Low	Low	0.217	0.097	0.026	[0.043, 0.427]
Low	Mean	0.191	0.084	0.022	[0.050, 0.376]
Mean	Low	0.165	0.082	0.045	[0.015, 0.328]
Mean	Mean	0.136	0.066	0.039	[0.018, 0.272]

Note: An extended version of this Table and effect visualisations can be found in the [supplementary materials](#).

amongst participants of the study. On the other hand, all proximal stressors, pride, and the mental health and well-being outcomes were better explained by between-person differences in the current sample. Therefore, stable differences in the average experience of participants better accounted for the observed variation in these constructs than moment-to-moment fluctuations within participants (Dyar et al., 2022; Myin-Germeys & Kuppens, 2022). Furthermore, these results suggest that the event-level may be less relevant and that these constructs are subject to gradual changes over time, as suggested by previous EMA studies. Common ICC values in EMA studies are between 0.2 and 0.4 (Myin-Germeys & Kuppens, 2022) and previous QMSR EMA studies report ICC values around 0.5 for mental health outcomes (Dyar et al., 2022; Livingston et al., 2020; Mereish et al., 2022). These are lower than those found in the current study and, thus, assessing proximal stress, pride, and mental health and well-being with lower frequency may be more appropriate. This could facilitate assessing constructs in more detail without raising participant burden (Williams et al., 2022).

Based on these findings, event-based sampling instead of fixed-interval may appeal more to the distribution of distal stress variation. Further, infrequent but detailed assessments of proximal stress, pride, and mental health and well-being may facilitate a more appropriate understanding of how QMSR processes relate to health (Dyar et al., 2022; Livingston, 2017; Myin-Germeys & Kuppens, 2022). Finally, whilst changes in proximal stress, pride, and mental health and well-being may be less frequent, as indicated by the high ICC's, these changes may yet be meaningful to the lived experience of participants (Koopman & Dimotakis, 2022; Livingston et al., 2017; Williams et al., 2022). This is not something captured by the ICC (Dyar et al., 2022; Myin-Germeys & Kuppens, 2022). To remedy this, it could be considered to include qualitative measures that allow for more detailed and nuanced insight into the experience of these constructs. In conclusion, the current study found high portions of between-person variation in internally held constructs and low portions in event-based constructs. Future research should consider event-based sampling approaches based on distal stress encounters, investigate the role of cumulative stress in more detail, and consider qualitative measures to gain more insight into lived experience.

The second research question was concerned with the extent to which mental health is associated with queer minority stress and resilience processes on the within-person level. Overall, based on these findings, the current study can be said to affirm the theoretical assumption of QMSR frameworks and previous research conducted in this domain, momentary and cross-sectional. Whilst conclusions about causality cannot be drawn, the results indicate temporality between experiences of distal stress and subsequent mental health

and wellbeing consequences on the within-person level. Distal stress was conceptualised as events of enacted stigma and found to predict momentary increases in subsequent anxiety, depression, and negative well-being directly. For depression and anxiety, the current study replicated the findings by Livingston et al. (2020) and Mereish et al. (2022) by indicating that distal minority stress is associated with momentary within-person increases in these constructs. Furthermore, internalised queerphobia and negative expectations demonstrated predictive power, emerging as the most important negative factors associated with momentary mental health and well-being out of the included minority stress constructs. Regarding resilience, pride emerged as a consistently associated with positive momentary mental health and well-being. These factors, distal stress, internalised queerphobia, negative expectations, and pride, were found to best explain within-person associations of QMSR with mental health and well-being when examining the full QMSR framework as conceptualised in the current study. Moreover, several interaction terms were observed as significantly predictive, affirming the assumed interactive nature of proximal stress and resilience factors.

Internalised queerphobia and negative expectations were buffered against by resilience. Associations of distal stress with negative mental health and well-being over these proximal stressors were often not observable at higher momentary resilience. With reduced resilience, however, the associations gained predictive power and weight. This was in line with findings reported in cross-sectional literature (Bockting et al., 2013; Herek et al., 2009; Inderbinen et al., 2021; Stein et al., 2023; Williams et al., 2023) and, therefore, demonstrated that conceptualisations of these interactions apply on the within-person level as well. Additionally, community connectedness may specifically serve as an effective buffer against internalised queerphobia. A specific observed pattern was high community connectedness demonstrating high influence on the associations between internalised queerphobia and anxiety. The lower bound MCMC 95% CI of effects with high community connectedness was consistently amongst the lowest estimates. Social identity theory (Turner & Oakes, 1986) and the contact hypothesis (Pettigrew & Tropp, 2006) suggest that contact with stigmatised social groups under appropriate circumstances leads to reduced stigma through positive and nuanced exposure. Moreover, SIT posits that experiencing stigma may enhance identification with the stigmatised identity (Berjot & Gillet, 2011). This is consistent with the findings of the current study, which suggest that positive community experiences inhibit the negative associations of enacted stigma through internalised stigma on mental health.

Identity concealment on the other hand was observed as quite nuanced in its interactions with resilience. As such, identity concealing was beneficial during moments of

low resilience and adverse during moments of high resilience. Previous research has suggested that identity concealment may have different meanings depending on context. As such, identity concealment may serve a protective function against enacted stigma by reducing the chance of encountering it (Bockting et al., 2013; Cooke & Melchert, 2019). Moreover, for binary-trans individuals invested in presenting as their sex/gender, it may be gender-affirming to conceal one's gender minority identity (Meidlinger & Hope, 2014). Yet, while Livingston et al. (2020) suggest that identity concealment may be functional to reduce enacted stigma experiences, it may also exacerbate the effect these have on anxious and/or depressed mood. Additionally, the concealability of one's minority identity and the impact this may have varies between individuals (Frable et al., 1998). Thus, it may be protective, affirming, invalidating, or not possible in the first place. The results lend support towards this and indicate that pride and community connectedness can shape the meaning of identity concealment. More research is needed to fully explore the functions and nuances of this proximal stressor and its interactions with different minority identities.

The current study was exploratory in nature and has identified which QMSR constructs are likely of high importance to explain mental health and well-being. For the main effect models, however, it was also observed that little variance could be explained when considering only fixed within-person effects. Thus, considering individual differences in addition to within-person factors likely provides a better understanding of the associations between QMSR and mental health and well-being. This is also in line with the findings relating to the first research question. Furthermore, the complex nature of the model and the low average response rate raise concerns about overfitting of the data (Myin-Germeys & Kuppens, 2022; Nakagawa & Schielzeth, 2013). Future research should apply simpler models using these most important constructs and aim to scrutinise their predictive and explanatory power¹².

Limitations and Strengths

Limitations

The sample was convenience-based and not representative of the (queer) population. It consisted of young people with enough free time to participate, access to mobile phones, and fluent in English. Education and ethnicity were not assessed, further limiting inferences

¹² A more detailed discussion of future avenues for research and intervention studies is available in the [supplementary materials](#).

about representativeness. It also likely overrepresented gender minorities and sexual identities other than lesbian, gay, or bisexual compared to regional demographics (Hasselt et al., 2023). Therefore, the degree to which the findings are generalisable to the larger population of Dutch queer youth may be limited.

The current study underperformed regarding the average response rate. In previous studies applying EMA in queer samples, these were reported between 60% and 95%. Higher compliance rates would bring more certainty to the results by virtue of more accurate P-S scores. This was, in part, due to the TIIM app being technically unreliable and future research should avoid TIIM for EMA studies. Another likely factor was the low incentive provided for adherence. The analyses conducted remained possible as no data was lagged. Still, addressing these factors would improve the data quality and, thus, the robustness of the findings.

The EMA measure deployed to assess the QMSR constructs did not undergo an investigation of its psychometric properties prior to the study. It was rigorously face validated with a queer advisory group during development, but detailed insights about convergent, discriminant, and ecological validity, as well as reliability could not be drawn. Thus, the interpretation of the results of the current study must assume these as given, based on the affirmation of the face validity of items during initial scale development.

Strengths

The first strength is that the EMA instrument was not defined by binary-trans boundaries or references to specific queer identities. Instead, the divergence from cis-heterosexist assumptions (i.e., queerness) overall was conceptualised as the source of stressors and, thus, non-binary genders and sexualities were able to be included. The current study, therefore, adopts a more intersectional approach to queerness than previously seen.

Further, the current study expands on the literature by including measures of positive well-being. In contrast, much of the existing literature places a focus on deficits in mental health and wellbeing (Gosling et al., 2022; Mezza et al., 2024). Such approaches further contribute to the pathologisation of social deviance and, thus, perpetuate stigma. As such, the current study stands out by exploring mental health and well-being more holistically.

Next, the current study was a wider exploration of QMSR and mental health and well-being processes in queer people using EMA than previously seen and offers a variety of novel insights for future studies seeking to investigate such processes. Especially insights about the variability of proximal stress and resilience suggest clear future directions of how to appropriately assess and work with these constructs.

More, the EMA setup was informed by participatory design and led to the collected data being relatively dense, allowing for detailed insight into the lived experience of participants (Liao et al., 2016; Myin-Germeys & Kuppens, 2022). This enhanced the research by investigating psychological processes closer to where they occur and appropriately connecting lived experience and research.

Conclusion

To the authors knowledge, this study was the first to comprehensively and holistically investigate within-person associations of QMSR processes with mental health in queer people in everyday life. The purpose of the study was to explore the within-person daily variance of the relevant constructs, and applicability of the minority stress theory to them. To do this a purpose-build measure was applied across a two-week EMA data collection. The findings lend support towards the theoretical framework and demonstrate QMSR processes as varying and interconnected throughout everyday life, whilst offering valuable methodological insights for future studies seeking conduct similar investigations. Multiple limitations and shortcomings of the existing literature were addressed. First, both outcomes of mental health and well-being were considered, shifting the deficit-based approach taken by many studies to include aspects of positive psychology. Second, by applying EMA, inferences about temporality could be drawn and the lived experience of participants could be appropriately captured. Third, the current study was the first to examine a full model of queer specific distal stress, proximal stress, and resilience factors through EMA and examine their within-person variability and associations. Fourth, the current study was not defined by the boundaries suggested by cis-hetero-normativity and enabled insights about queer experiences across various sexual and gender minority identities.

The results expand upon the understanding of QMSR processes and highlight the extent to which these processes are important to daily life. Where previous literature suggests that people who experience more queer minority stress on average also experience more adverse health outcomes, the current study demonstrated this to be the case on an event-level as well. Where resilience factors are suggested as buffering against negative influences, the current study demonstrates their varying dynamics, interplays, and the conditions under which associations occur. As such, the findings underline the critical need to mitigate minority stress and enhance resilience factors amongst queer people. Not only as a function of averages and the majority, but also on inter-, and intrapersonal levels with respect to lived experience.

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Appendix

Appendix 1:

Informed Consent Form

Thank you for your interest in this study!

The purpose of this research project is to investigate event-level processes of queer minority stress and resilience. The LGBTQIA+ community sets itself apart from a majority cis-hetero normative society. The status as sexual and gender minorities leads to experiences of enacted stigma (i.e., discrimination, harassment, violence, exclusion). From such events, negative self-evaluations can be derived (internalised queerphobia, negative expectations, identity concealment). These external and internal stressors negatively affect mental health. Queer people may also derive positive resources from their identity, such as pride and social connection (e.g., the Queer community). Such resilience factors buffer against the negative effect of stressors on mental health.

We understand that queerness is a natural part of human diversity and not an illness, a condition, or pathology. However, there exist very real and concerning health disparities between Queer and cis-hetero people. Queer people globally report significantly worse mental and physical health. If queerness is not illness, how can we explain this?

A suitable model to explain this is the minority stress theory, which posits that minorities experience unique types of stressors resulting from their minority status (i.e., being different from the majority).

This model has been shown to be robust in predicting health outcomes. However, we know little about what these processes look like throughout daily life. Thus, the current study aims to investigate processes of queer minority stress and resilience, as they unfold in everyday life, using ecological momentary assessment.

What happens in this study?

- Providing informed consent & demographics
- Baseline assessment: online survey (10 – 30 minutes)
- Then, for 14 days, five short, daily surveys (3 minutes).
- Skipping surveys has no consequences to the participant (except for the raffle, see below).

- Follow-up assessment: online survey (10 – 30 minutes)

Benefits and risks of participating

- You can win 50€ ! After the study concludes, each eligible participant is entered into a raffle. A higher response rate (% of surveys completed) increases your entries and chance to win. Therefore, each survey filled out raises your chances! Only participants who complete the study are eligible: completing the baseline & follow-up surveys AND being active on at least 12 out of 14 days.
- This study considerably contributes to the literature of LGBTQIA+ mental health. By participating in research like this, you help with expanding the basis for diversity, equity, and inclusion.
- Throughout this study, you will be reflecting on your mental health, as it relates to your queer identity. This could possibly lead to new personal insights and a heightened awareness of mental health processes.
- EMA relies on a multiple, short questionnaires to be filled out throughout the day, across multiple days. This can lead to participant response burden, as one may feel negatively about filling out/missing surveys.
- This study has been reviewed and approved by the BMS Ethics committee/domain Humanities & Social Sciences, application #231320

Procedures for withdrawal from the study

To withdraw from the study during data collection, participants can choose to opt-out inside the TIIM app at any time without providing a reason. To withdraw after study completion, please email the primary researcher at j.r.behrens@student.utwente.nl

Personal Data collection, use, & storage

Personal data to be collected include age, gender/sex assigned at birth, current gender identity, sexual orientation, country of birth, and membership/affiliation with LGBTQIA+ associations. These are used to determine eligibility to the study and to separate different demographic groups in data analysis. All information is fully anonymised and is only accessible to the primary researcher. Withdrawing from the study also means the final and complete deletion of all your data. The data from this study is stored in encrypted files, only accessible to the primary researcher. No directly identifiable data is collected. After study

completion, the data will not be published or made accessible to anyone. The data will be retained for five (5) calendar years, after which it will be permanently deleted.

Contact details

Primary Researcher: Jan Behrens j.r.behrens@student.utwente.nl

Primary Supervisor: Tessa Dekkers (t.dekkers@utwente.nl)

Research organisation: Th!nk with Pride/UT (pride@utwente.nl)

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee/domain Humanities & Social Sciences of the Faculty of Behavioural, Management and Social Sciences at the University of Twente by ethicscommittee-hss@utwente.nl

By clicking 'continue' you confirm your informed consent to participate in the study.

Appendix 2:*Queer Minority Stress and Resilience Scale*

QMSR Construct	Item
<i>Event-based items (choose which apply)</i>	
Discrimination	I had difficulties finding and/or could not find an all-gender bathroom. I felt dysphoric, judged, and/or unsafe in a public bathroom.
Rejection	I was rejected, excluded, and/or made to feel unwelcome. I was treated unfairly, differently, and/or disrespectfully. I was stared or looked at judgementally. I was ignored, isolated, made to feel invisible, and/or not taken seriously. I was criticised for my appearance and/or made to change it.
Victimisation	I heard a queerphobic slur, stereotype, and/or statement. I was pushed, hit, targeted when someone threw something, and/or otherwise physically harmed. I was made to feel unsafe and/or acted uncomfortably around. I was sexually harassed or assaulted. I was verbally harassed, made fun of, and/or threatened.
Non-Affirmation	I was misgendered, deadnamed, and/or addressed with the wrong pronouns.
Community Connectedness	I have spent time interacting with queer people. I felt connected to, and as a part of the queer community. I saw and/or felt seen by queer people. I saw queer representation. I was accepted, affirmed, and/or embraced by queer people.
<i>VAS items (0 - fully disagree/100 - fully agree)</i>	
Negative expectations	Openly expressing my queerness will lead to negative events in the future
Identity concealment	I hide, mask, or repress my queer identity/expression

Internalised queerphobia	Being queer makes me feel depressed, unhappy, embarrassed, or ashamed
Pride	Being queer makes me feel proud, happy, special, and unique I am comfortable being open about my queer identity/expression

Appendix 3:*Participant's last response and compliance rate*

Eligible participants			
ID	Last Day	Last Beep	Compliance rate
3	14	70	70%
4	14	68	72.9%
5	14	70	74.3%
7	14	66	25.7%
8	14	66	27.1%
9	14	70	82.9%
10	14	70	88.6%
11	5	21	14.3%
12	14	68	20%
13	13	61	35.7%
14	14	70	54.3%
15	14	70	97.1%
16	6	29	12.9%
17	14	67	51.4%
18	14	70	94.3%
19	14	70	30%
20	12	60	48.6%
22	13	62	31.4%
25	14	68	75.7%
26	14	70	98.6%
27	4	18	12.9%
31	14	70	35.7%
Ineligible participants			
ID	Last Day	Last Beep	Compliance rate
1	1	3	4.3%
2	5	22	4.3%
6	4	17	7.1%
21	1	0	0%
23	3	14	4.3%
24	1	0	0%
28	1	0	0%
29	7	34	4.3%
30	1	1	1.4%
32	4	20	5.7%