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Authors	Young, Anna Navin;Di Blasi, Zelda;van Zyl, Llewellyn;Foley, Sarah;Hunt, Eithne
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"The normal flow of time stopped with the normal flow of life": A mixed methods investigation of multifaceted subjective experiences of time during the first year of the COVID-19 pandemic

Anna Navin Young[1], Zelda Di Blasi[1], Llewellyn E. van Zyl[2,3], Sarah Foley[1], and Eithne Hunt[4]

Abstract

The COVID-19 pandemic caused widespread disruptions to daily life which impacted how people used and experienced time. This study employed a mixed-method, person-centered approach to investigate people's subjective experiences of time during the first year of the pandemic. Specifically, it aimed

[1]School of Applied Psychology, University College Cork, Cork, Ireland
[2]Psynalytics, Eindhoven, the Netherlands
[3]Optentia Research Unit, North-West University, Vanderbijlpark, South Africa
[4]Department of Occupational Science and Occupational Therapy, University College Cork, Cork, Ireland

Corresponding author:
Anna Navin Young, School of Applied Psychology, University College Cork, T23 TK30 Cork, Ireland.
Email: anavinyoung@ucc.ie

to investigate experiences of time as multifaceted, measuring the pandemic's impact on people's perceptions of routine changes, passage of time, and quantity of time. Further, the study explored participants' descriptions of their temporal experiences. Data were collected from an online survey of 272 participants ($M_{age} = 27.74$, SD = 11.95) in Spring 2021. A latent class analysis identified two distinct classes: Varied Time Changes and Minimal Perceived Changes. Reflexive thematic analysis (RTA) of open-ended survey responses revealed that those in the Varied Time Changes group described feelings of disorientation, lack of temporal structure, and an inability to use time meaningfully, while Minimal Perceived Changes participants focused on themes of accepting change as normal, maintaining routines, and savoring the present moment. Notably, the Minimal Perceived Changes group was significantly older ($M = 37.86$, SD = 14.28) than Varied Time Changes ($M = 26.89$, SD = 11.36). This study contributes to understanding the complexity of temporal experiences under prolonged uncertainty, highlighting the importance of personal context in shaping one's response to broad social disruptions.

Keywords
COVID-19 pandemic, latent class analysis, mixed methods, reflexive thematic analysis, subjective time

Introduction

Time researchers have long noted the role social contexts play in shaping individuals' relationship with time (Flaherty, 2018; Flaherty et al., 2005; Levine, 1997; Orlikowski and Yates, 2002; Shipp and Jansen, 2021; Zimbardo and Boyd, 2008). The COVID-19 pandemic is a stark example of how widespread disruptions to daily life impacted how people used and experienced time. On one level, these disruptions were visible in changes to how people used their time during the pandemic. For instance, time-use data demonstrated an overall increase in time spent in the home and a corresponding decrease in time spent traveling or outside the home during the early stages of the pandemic (e.g., Batur et al., 2023; Gershuny et al., 2021). Consequently, time spent on occupations such as cleaning, cooking, and childcare was noted to increase (Gershuny et al., 2021). Additionally, changes in time use were observed in work time such as increased work-from-home patterns (e.g., Batur et al., 2023), and a rise in work activities occurring outside of traditional work hours (Lee and Tipoe, 2021).

Beyond changes in time use, a growing body of research has also investigated how the COVID-19 pandemic impacted subjective experiences of time (e.g., Andersson et al., 2023; Cellini et al., 2020; Droit-Volet et al., 2020, 2021,

2023; Martinelli et al., 2021; Ogden, 2020, 2021; Restubog et al., 2020). Several qualitative studies have aimed to capture lived experiences of time during the pandemic. For example, a diary study conducted by Ruse et al. (2023) identified patterns of frozen temporality in which participants described living in a suspended present. Participants described this suspended present as an experience where normal routines disappeared and they were unable to plan or set expectations for the future (Ruse et al., 2023). Furthermore, an interview study conducted in Poland found participants struggling with a lost sense of control of their time (Krajewski et al., 2023). Here, participants described feeling unable to structure time or activities due to the disruptions caused by the pandemic and related public health measures (Krajewski et al., 2023). These participants also described an orientation toward the present, which related to patterns of greater reflection as well as overwhelm related to news and current affairs (Krajewski et al., 2023).

In addition to these qualitative insights, time-related pandemic studies have also taken quantitative approaches to investigating subjective experiences of time, often using specific subjective time constructs. For example, passage of time judgments (PoTJs) have been frequently evaluated to understand temporal distortions during the COVID-19 pandemic (e.g., Droit-Volet et al., 2020, 2021; Ogden 2020, 2021). PoTJs describe the subjective pace at which time seems to move (Ogden, 2020). PoTJs are perceived comparisons to a conceptualized norm in that the perception of time moving faster, slower, or the same as normal are all judgments based on a conceived baseline of a "normal" pace of time (Flaherty, 2018). Employing quantitative surveys, studies across the globe have reported a majority of people experienced distortions in PoTJs during the pandemic, with perceptions of time moving slower or faster than normal (e.g., Droit-Volet et al., 2020, 2023; Ogden 2020, 2021). Factors such as age (e.g., Andersson et al., 2023; Ogden, 2020), boredom (e.g., Droit-Volet et al., 2020, 2021), and social satisfaction (e.g., Ogden, 2020; Velasco et al., 2022) were associated with changes in PoTJs.

Perceptions related to quantity of available time are recognized as another important facet of multifaceted experiences of time (Giurge et al., 2020), though have received less direct attention in the pandemic literature (Andersson et al., 2023; Cravo et al., 2021). In the current study, we refer to these as quantity of time judgments (QoTJs). Fundamentally, QoTJs assess how much time people perceive is available to them and often involve demand-resource appraisals related to how much time people feel is available compared to everything they need and want to do that requires that time. Experiencing feelings of having too much time can be associated with boredom and lack of purpose (e.g., Sharif et al., 2021), which have been widely observed during the pandemic (e.g., Droit-Volet et al., 2021). Conversely, experiences of not having enough time may be related to changes in job or household demands during the pandemic

(e.g., Clark et al., 2021). QoTJs can thus be useful to garner insight into how people perceived their time in relation to changes brought on during the pandemic.

Underlying mechanisms of time perceptions

Several underlying cognitive and psychological mechanisms have been identified that influence perceptions of time (Wearden, 2016; Wittmann, 2020). Importantly, time judgments can occur both prospectively (period presently being experienced) and retrospectively (period that has already elapsed; Wittmann, 2020). Mechanisms such as attentional allocation, emotional valence, and event salience can impact uniquely on prospective and retrospective perceptions (Wearden et al., 2014; Wittmann, 2020). Internal clock models, such as the Scalar Expectancy Theory, recognize the role of a biological pacemaker, or internal clock, that influences individuals' perception of time (Wearden, 2003). For example, the more attention allocated to time, the more time pulses from the internal clock are accumulated within working memory, and the longer a duration is perceived to be (Wearden, 2003; Wittmann, 2020). Similarly, the attentional-gate model identifies attention to time as well as emotional arousal as core features impacting prospective time judgments (Zakay and Block, 1997). From this perspective, individuals may perceive time to pass slower when they pay more attention to time and when they experience greater affect (e.g., irritation, boredom; Jokic et al., 2018).

Retrospective time judgments rely on memory content and event salience (Wearden, 2016). Periods with less experiential diversity may be perceived as passing faster due to fewer stored memories (Wittmann, 2020). Equally, when experiencing time pressure, people are typically less focused on the present, resulting in fewer detailed experiences stored in memory and the perception that time moves faster (Wittmann, 2020; Wittmann et al., 2015). Similar to prospective time judgments, retrospective time judgments may also be influenced by affect and arousal, with greater negative affect and lower levels of arousal associated with perceptions of time passing slower (Wearden et al., 2014).

These underlying mechanisms provide important considerations when seeking to understand experiences of time during the COVID-19 pandemic. As previous time-related pandemic literature has found, experiences of boredom and monotony, which might be characterized by lower cognitive load, negative affect, and lower arousal, may correspond with perceptions of time passing slower during the pandemic (Ogden, 2020; Wearden et al., 2014; Wittmann, 2020). In contrast, increased feelings of stress and overwhelm in response to the public health crisis may involve higher arousal and could correspond with perceptions of time passing faster (Wittmann, 2020). Equally, if people experienced greater monotony or time pressure in their daily routines, this might have resulted in fewer stored memories, influencing retrospective time judgments of the first year of the pandemic.

A multifaceted perspective of experiences of time

Though experiences of time are acknowledged to be complex and multidimensional (Aeon et al., 2020; Shipp and Jansen, 2021), they are commonly studied individually (Andersson et al., 2023). Furthermore, though several qualitative studies have been conducted to investigate felt experiences of time during the pandemic (e.g., Krajewski et al., 2023; Ruse et al., 2023), time-related pandemic literature has predominantly relied on quantitative approaches. Specifically, time research to date has predominantly relied on variable-centered quantitative approaches, which work from the assumption that "all individuals from a sample are drawn from a single population for which a single set of 'averaged' parameters can be estimated" (Morin et al., 2016: 8). Variable-centered approaches overlook the possibility of distinct subgroups within a sample that may be characterized by unique experiential differences (Howard and Hoffman, 2018). In contrast, applying a person-centered approach to investigate multifaceted experiences of time would allow for the identification of distinct temporal profiles within the dataset based on different temporal experiences (Ferguson et al., 2019).

Experiences of time can relate to how socially and occupationally connected individuals feel including how engaged people feel in daily routines (e.g., Ogden, 2020; Sharif et al., 2021), how synchronized they feel with larger collective temporal rhythms (Levine, 1997; Lundström, 2022), and generally how disrupted they feel in response to uncertainty and change (Holman and Grisham, 2020). Experiences of time may differ across individual characteristics such as age, gender, living conditions, and engagement in employment and/or education (e.g., Andersson et al., 2023; Bhattacharjee and Mogilner, 2014; Bó, 2022; Bó and Dukhovnov, 2022; Giurge et al., 2021; Ogden, 2020). Furthermore, different countries took different approaches to implementing and enforcing public health restrictions throughout the pandemic. These restrictions may have additionally contributed to how individuals experienced time based on their country of residence. Few studies to date have evaluated individual characteristics and multidimensional experiences of time during the pandemic. One example, Andersson et al. (2023), found that having children at home was associated with greater reports of feeling rushed, time moving quicker, and not having enough time. They also found that older individuals were less likely to report feeling rushed or feeling that time was moving too slowly (Andersson et al., 2023). Further multifaceted, person-centered investigations would enhance our understanding of how people experienced time during the pandemic, who experienced time differently, and in what ways.

Time scholars have called for the use of innovative approaches in seeking to capture and understand the unique lived experiences of time during the pandemic (Bailey et al., 2020). In particular, mixed methods approaches have been

emphasized for their appropriateness in addressing the complex and multifaceted nature of time (Boniwell, 2006). A mixed methods approach, while time-consuming and demanding of multiple skillsets, can provide a deeper, more nuanced understanding of lived experiences (Creswell, 2011; Wasti et al., 2022). When paired, quantitative approaches can identify patterns within a sample and qualitative approaches can then provide greater depth of insight into experiential nuances (Creswell, 2011). In the case of a person-centered analysis, quantitative analysis may first identify distinct temporal subgroups or classes based on multifaceted time constructs. With distinct classes identified, qualitative data can be divided and analyzed by class to provide detailed perspectives of how each class experienced their time.

As such, the purpose of this study was to investigate people's multifaceted experiences of time during the first year of the COVID-19 pandemic using a mixed methods, person-centered approach. By taking a person-centered approach, the study aimed to identify distinct temporal classes based on participants' perceived changes in routines, passage of time, and quantity of time. As previous studies have indicated associations between experiences of time and various demographic factors, the study further aimed to understand whether demographic variables varied across the temporal classes. Upon identifying unique temporal classes, the study then aimed to use participants' qualitative data to further analyze and understand the experiences of each temporal group. Ultimately, by employing this multifaceted approach, the study aimed to offer a robust and holistic understanding of experiences of time under pandemic conditions.

Method

Positionality within the field of time studies

Founding scholars in the area of time studies have noted the field's transdisciplinary nature and the resulting diversity of methodological, conceptual, and theoretical approaches in which time is investigated (Adam, 2022). Within the social sciences, this diversity of investigation is often observed in the distinction of psychological and social time (Flaherty, 2022; Orlikowski and Yates, 2002). The sociological or intersubjective perspective understands time as socially constructed and may examine dominant temporalities, temporal structures, and temporal norms as they serve to shape and guide temporal practices within a population (Sharma, 2022; Shipp and Jansen, 2021). Psychological, or intrasubjective time, focuses on the ways in which individuals experience their time (Shipp and Jansen, 2021). The psychological approach often uses various constructs and measures to investigate perceptions of time's pace, duration, and availability, or orientation to past, present, and future (Denovan and Dagnall,

2019; Shipp and Jansen, 2021; Zimbardo and Boyd, 2008). Here, the challenges and complexities of a transdisciplinary field are evident, as the use of a variety of terms, measures, and concepts are often used interchangeably across the vast literature (Giurge et al., 2020; Orlikowski and Yates, 2002).

Though diverse in its operationalizations, the psychological time literature is fundamental to understanding the ways in which individuals experience time in their daily lives. The current study drew from time studies' transdisciplinary influence in its critical engagement with time while being fundamentally positioned within the scope of psychological time. Implicit in the study's aim to investigate how individuals perceived time during the pandemic is the acknowledgment of the sociological level and the pandemic's potential impact on temporal structures and norms. However, the study aimed to focus on understanding individuals' experiences and perceptions within these larger contexts opposed to examining the contextual constructs themselves.

Participants

A total of 272 participants completed the online survey between April 10 and June 7, 2021. Participants ranged from 18 to 78 years of age ($M = 27.74$, $SD = 11.95$). They identified as female (68.3%), male (27.3%), or other (4.5%). A majority of participants were employed (27.6%), attending university (30.5%), or working and studying (30.7%). Most participants lived with others during the first year of the pandemic (94%), though only 29.4% were living with children under 18 years of age. Living environments ranged between urban (27.3%), suburban (26.9%), and rural (26.6%), with some participants moving between multiple environments during the first year of the pandemic (19.2%). Influenced by the convenience sampling recruitment strategy and the research team's location, participants primarily resided in Ireland (74.6%), where strict public health restrictions were imposed (Brent, 2021). Roughly half of participants were not in a relationship at the time of data collection. See Table 1 for a further overview of participants.

Measures

Demographic questions. Participants reported their age, gender, current employment and/or studies, relationship status, country of residence, living arrangements, whether they had children, living environment (urban, suburban, or rural), and any restrictions or public health measures in place in their area of residence at the time of completing the survey.

Experiences of time variables. A multifaceted survey was used to measure perceptions of changes in routines, passage of time, and quantity of time during the

Table 1. Demographic overview of the dataset.

Sample size	272
Age (mean, SD)	27.74 (11.95)
Range (years)	18–78
Gender	
Female	68.3%
Male	27.3%
Other	4.5%
Employment status	
Employed	27.6%
Student	30.5%
Student and employed	30.9%
Unemployed	11%
Relationship status	
Single	48.9%
Relationship, living together	23%
Relationship, not living together	28.1%
Country of residence	
Ireland	74.6%
USA	21.7%
Other	3.7%
Cohabitation	
Living alone	6%
Living with others	94%
Living with children	
Yes	29.4%
No	70.6%
Restrictions[a]	
No restrictions	5.1%
Some restrictions	21%
Heavy restrictions	73.9%
Living space	
City	27.3%
Suburban	26.9%
Rural	26.6%
Combination	19.2%

[a]Heavy restrictions included six or more of the eleven restriction categories provided, including "masks are required," "travel outside the home is limited to essential activities," and "outdoor social gatherings/meetups are prohibited."

pandemic. Adhering to standard analyses of subjective perceptions of time (e.g., Andersson et al., 2023; Martinelli et al., 2021; Ogden, 2020), we took an item-specific approach in our data collection and analysis. Seven quantitative items assessed perceptions of changes in routines, passage of time, and quantity of time.

The survey began by asking participants whether they perceived time to have changed during the pandemic. Responses on a 4-point scale ranged from "no" to "yes, a lot." Perceptions of routine changes were measured in accordance with previous studies of time during the pandemic (e.g., Ogden, 2020). Participants were asked to report how much they agreed with the statement: "My daily routine has changed a lot as a result of the COVID-19 pandemic" (Ogden, 2020). Responses were measured on a 5-point Likert scale from "strongly agree" to "strongly disagree".

Passage of time judgments were collected using two items to evaluate the pace at which participants perceived time to move during the pandemic. Adapted from Ogden (2020), participants were asked, "Thinking about today, how has time felt like it is passing compared to before the pandemic?" and "Thinking about time generally throughout the pandemic, how has time felt like it is passing compared to before the pandemic?" Responses were measured on a 7-point Likert scale from "extremely slow" to "extremely fast."

Quantity of time judgments were collected using three items to assess the amount of time participants perceived as available to them during the pandemic. Participants were asked "To what extent has the pandemic affected the amount of time you have to do what you need and want to do?" Responses ranged on a 5-point Likert scale from "I have a lot less time to do what I need and want to do" to "I have a lot more time to do what I need and want to do." Additionally, participants were asked how often during the pandemic they felt they did not have enough time and how often they felt they had too much time for everything they needed and wanted to do. Responses ranged on 5-point Likert scales from "rarely to never" to "very often."

Qualitative survey questions. The survey also contained nine open-ended questions to collect qualitative data regarding participants' experiences of time during the first year of the pandemic. These questions invited participants to expand on their quantitative responses by descriptively speaking to their experiences of temporal changes in routines, passage of time, and quantity of time. Responses were not limited by word count and aimed to capture rich insights to supplement data collected through the quantitative questions. Example questions included, "What do you think has influenced your perception of time passing during the pandemic?" and "During the pandemic, what have been your experiences of not having enough time for the things you need and want to do?"

A total of 39,315 words were produced across participants' responses. All participants responded to at least two of the open-ended questions. Missing responses ranged from 21 to 181 participants per question, for an average response rate of 76.31% ($M = 207.56$, $SD = 48.64$). The 181 missing responses were in response to a question asking those who were living with children how this influenced their experiences of time. Presumably only participants

living with children responded to this question. Response rates generally decreased for later questions (e.g., question eight had a response rate of 70%) compared to earlier questions (e.g., question two had a response rate of 90.44%), possibly indicating response fatigue. However, lack of response may also have been determined by the question topic, as response rates for question seven ("During the pandemic, what have been your experiences of not having enough time for the things you need and want to do?"; response rate = 63.97%) and question eight ("During the pandemic, what have been your experiences of having too much time and not knowing what to do with it?"; response rate = 70.22%) were lower than the final question ("Do you think about and/or value time differently now than you did before the pandemic? If so, how to you think about and/or value time differently now?"; response rate = 74.26%).

Procedure

The study received ethical approval through University College Cork's School of Applied Psychology's Ethics Committee. To pilot the survey's clarity and ease of use, it was initially distributed to selected members in the authors' networks. Pilot participants completed the survey and provided feedback regarding any points of confusion or technical difficulties. Minor wording adjustments were made in response to this pilot feedback and the survey was then distributed to a wider audience through convenience sampling. The online survey was distributed using the survey software, Qualtrics (Qualtrics, 2020). The survey was distributed by the research team and colleagues across social media (e.g., LinkedIn) and university communication channels.

Data analysis

Statistical analyses were conducted with SPSS 26.0 (IBM Corp, 2019) and Mplus 8.4 (Muthén and Muthén, 1998–2018). Descriptive statistics were computed to describe the data, including, where appropriate, means, standard deviations, and frequencies. Furthermore, associations were evaluated between demographic variables, perceived routine changes, and passage and quantity of time judgments. Using a latent class analysis (LCA), the quantitative analysis aimed to identify different subgroups based on participants' experiences of time during the pandemic. LCA is a mixture model using a probabilistic framework to identify unobserved groups within the observed data (Spurk et al., 2020). This approach establishes participants' membership probabilities to identify distinct groups or classes within the data. Once classified, these groups can be interpreted and compared based on their variable patterns (Spurk et al., 2020).

The most appropriate model was determined by observing the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), and

Sample-Size Adjusted Bayesian Information Criterion (SABIC), with a lower value representing a preferred model (Ferguson et al., 2019). Entropy was also observed for each model, which indicates how well the classes of each model fit to the data (Celeux and Soromenho, 1996; Tein et al., 2013). A higher entropy value indicates a better fit, and values of 0.8 or higher suggest minimal classification uncertainty (Ferguson et al., 2019). The Lo-Mendell-Rubin test (LMR) and Bootstrapped Likelihood Ratio Test (BLRT) were used to compare each model to a model with one fewer class. Here, a nonsignificant result indicated that the model with fewer classes is better representative of the data (Ferguson et al., 2019).

Reflexive thematic analysis

Reflexive thematic analysis (RTA) was conducted following the procedures outlined by Braun and Clarke (2019). RTA is used to identify patterns across qualitative data, which are interpreted and presented as themes (Braun et al., 2016). It is important to note the active role of the researchers in conducting a qualitative analysis such as RTA. As Braun and Clarke (2019) highlight, researchers actively identify patterns across the data and construct themes through their interpretation of these patterns. Themes do not simply emerge from the dataset (Braun and Clarke, 2019). It is critical, then, to understand how researchers engaged with the data, and the approaches they took in their analysis. The analyses presented in this study took realist, semantic, and inductive orientations. Taking a realist approach assumes a direct relationship between the language being used to explain an experience, the experience itself, and the meaning of the experience being conveyed (Braun and Clarke, 2006). A realist approach often pairs well with a semantic orientation, where the researchers are focused on the explicit experiences that participants have reported in the data (Braun and Clarke, 2006). An inductive approach can also be described as "data driven" (Braun et al., 2016: 4). Here, the content of the data is what guides the analysis, rather than the application of external theories or frameworks to the data.

The first author conducted the thematic analyses for both classes. The six-phase process outlined by Braun and Clarke (2006, 2019) guided the analyses. The author first familiarized herself with participants' responses to the open-ended questions by reading through responses and taking notes on potential patterns. Initial coding was conducted across the nine open-ended questions. After conducting the LCA, participants' qualitative responses were divided by their subsequent class membership and independent thematic analyses were conducted for each class. The first author completed refined coding, code grouping, and theme construction for each class. The authors met regularly to discuss the patterns observed in the responses, working to construct the initial themes. The first author then finalized the themes and write ups for both classes, which

the team collaboratively edited for the final results. The resulting themes of each RTA are presented alongside their corresponding LCA class.

Results

Associations between demographic and time variables

Associations between demographic and experiences of time variables were evaluated (see Table 2). Kruskal–Wallis Tests indicated significant differences in age across employment status $X^2(3,\ n=270)=53.05,\ p=.01,\ \eta^2=.19$, relationship status $X^2(2,\ n=268)=63.86,\ p=.01,\ \eta^2=.23$, country of residence $X^2(2,\ n=270)=14.29,\ p=.01,\ \eta^2=.05$, and reported public health restrictions $X^2(2,\ n=270)=11.11,\ p=.01,\ \eta^2=.03$. Those who were employed ($Md_{\text{age}}=31,\ n=75$) were older than students ($Md_{\text{age}}=21,\ n=82$, students who were also working ($Md_{\text{age}}=21,\ n=83$), and those who were unemployed ($Md_{\text{age}}=21,\ n=30$). Those who were in a relationship and living together ($Md_{age}=35.5,\ n=62$) were older than those who were single ($Md_{age}=21,\ n=131$) and those who were in a relationship but not living together ($Md_{age}=21,\ n=75$). Those in the United States ($Md_{\text{age}}=25,\ n=59$) were older than those in Ireland ($Md_{\text{age}}=22,\ n=201$), and those living elsewhere in the world ($Md_{\text{age}}=23.5,\ n=10$). Those reporting no restrictions ($Md_{\text{age}}=29.5,\ n=14$) were older than those reporting some restrictions ($Md_{\text{age}}=24,\ n=57$, and those reporting heavy restrictions ($Md_{\text{age}}=22,\ n=199$). A Mann–Whitney U test indicated a significant difference in age between those living alone ($Md_{\text{age}}=30,\ n=16$) and those living with others ($Md_{\text{age}}=22, n=250$), $U=1128.50, p=.01, r=.18$.

Chi-squared tests for independence indicated significant associations between employment status and relationship status, $\chi^2(6,\ n=270)=30.78,\ p=.01$, Cramer's $V=.24$, country of residence, $\chi^2(6,\ n=272)=29.62,\ p=.01$, Cramer's $V=.23$, public health restrictions, $\chi^2(6,\ n=272)=27.14,\ p=.01$, Cramer's $V=.22$, and living environment, $\chi^2(6,\ n=270)=20.62,\ p=.01$, Cramer's $V=.16$.

Chi-squared tests for independence also indicated significant associations between country of residence and reports of living with children, $\chi^2(2,\ n=272)=6.74,\ p=.03$, Cramer's $V=.16$, reported public health restrictions, $\chi^2(4,\ n=272)=195.48,\ p=.01$, Cramer's $V=.60$, and living environment, $\chi^2(6,\ n=271)=21.63,\ p=.01$, Cramer's $V=.20$.

A Chi-squared test for independence (Yate's Correction for Continuity) indicated a significant association between living arrangements (alone or cohabitating) and living with children, $\chi^2(1,\ n=268)=5.80,\ p=.02$, phi $=.16$. A chi-squared test for independence indicated a significant association between living environment (e.g., urban, rural) and living with children, $\chi^2(3,\ n=271)=9.45,\ p=.02$, Cramer's $V=.19$.

Table 2. Associations between demographic variables and subjective experiences of time variables.

	M	SD	Skew	Kurtosis	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Age	27.74	11.96	1.93	3.31	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2 Gender	1.36	.57	1.30	.72	−.01	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3 Employment	2.25	.98	.18	−1.05	.19*	.07	–	–	–	–	–	–	–	–	–	–	–	–	–
4 Relationship	1.79	.85	.41	−1.51	.23*	.13	.24*	–	–	–	–	–	–	–	–	–	–	–	–
5 Country	1.82	.47	−.53	.51	.05*	.09	.23*	.11	–	–	–	–	–	–	–	–	–	–	–
6 Cohabitation	1.94	.24	−3.74	12.06	.18*	.02	.08	.10	.05	–	–	–	–	–	–	–	–	–	–
7 Living with Children	.29	.46	.91	−1.18	−.07	.06	.11	.14	.16*	.16*	–	–	–	–	–	–	–	–	–
8 Restrictions	2.69	.57	−1.64	1.72	.03*	.10	.22*	.12	.60*	.08	.11	–	–	–	–	–	–	–	–
9 Environment	2.38	1.08	.13	−1.26	.01	.12	.16*	.11	.20*	.17	.19*	.13	–	–	–	–	–	–	–
10 Time Change	1.49	.66	.02	−.21	−.12*	.06	.12	.13	.16*	.10	.10	.16*	.12	–	–	–	–	–	–
11 Routine Changes	3.37	.94	−1.86	3.36	−.26*	.12	.17*	.15	.13	.11	.18	.18*	.15	.27*	–	–	–	–	–
12 PoTJ-Today	2.89	1.73	.08	−1.07	.07	.10	.15	.13	.16	.15	.09	.13	.18	.03	−.07	–	–	–	–
13 PoTJ-General	2.35	1.65	.11	−1.31	.04	.13	.14	.17	.17	.11	.06	.15	.16	.03	−.05	.47*	–	–	–
14 QoTJ	2.52	1.27	−.58	−.82	−.14*	.17	.12	.13	.11	.13	.11	.09	.12	.05	.13*	−.16*	−.05	–	–
15 QoTJ-Not Enough Time	1.55	1.30	.53	−.85	−.09	.16	.10	.12	.09	.04	.13	.09	.13	.06	.05	.15*	.11	−.50*	–
16 QoTJ-Too Much Time	1.54	1.43	.43	−1.18	−.36*	.12	.17	.21*	.13	.13	.15	.15	.12	.08	.19*	−.26*	−.18*	.23*	−.16*

*$p < .05$ (2-tailed).

Associations between demographic variables and time variables. Associations between demographic and time variables indicated significant negative correlations between age and perceptions of time changing ($rho = -.122$, $p = .045$), routines changing ($rho = -.256$, $p = .01$), quantity of time changing ($rho = -.136$, $p = .03$), and experiences of having too much time ($rho = -.36$, $p = .01$; see Table 2).

Chi-squared tests for independence indicated significant associations between country of residence and reported perception of time changing during the pandemic, $\chi^2(6,\ n = 272) = 14.49$, $p = .03$, Cramer's $V = .16$, and public health restrictions and perceptions of time changing, $\chi^2(6,\ n = 272) = 13.93$, $p = .03$, Cramer's $V = .16$. Chi-squared tests for independence also indicated significant associations between employment status and reports of daily routine changes, $\chi^2(12, n = 253) = 21.75$, $p = .04$, Cramer's $V = .17$, public health restrictions and reported routine changes, $\chi^2(8, n = 253) = 16.90$, $p = .03$, Cramer's $V = .18$, and relationship status and perceptions of having too much time, $\chi^2(8\ n = 247) = 22.58$, $p = .01$, Cramer's $V = .21$.

Associations between perceptions of time changes. Spearman's Rank Order Correlations were conducted to investigate associations between perceptions of time changes and passage and quantity of time judgments (see Table 2). A positive correlation was observed between reported time change and daily routine changes, $rho = .27$, $p < .01$. Additionally, greater perceived changes in daily routines were also associated with QoTJs of having a lot more time, $rho = .13$, $p < .05$ and too much time, $rho = .19$, $p < .01$.

PoTJs for today (day of survey completion) and PoTJs for general (across the first year of the pandemic) were positively correlated, $rho = .47$, $p < .01$. PoTJ-today was also associated with QoTJs, with faster pace being associated with perceptions of having less time, $rho = -.16$, $p < .01$. Similarly, PoTJ-today was associated with QoTJs of not having enough time, $rho = .15$, $p < .05$, and negatively associated with QoTJs of having too much time, $rho = -.26$, $p < .01$. Perceptions of time moving faster were thus associated with more frequent experiences of not having enough time and fewer experiences of having too much time.

Finally, QoTJs were correlated. Perceptions of having more time were negatively correlated with perceptions of not having enough time, $rho = -.50$, $p < .01$, and positively correlated with perceptions of having too much time, $rho = .23$, $p < .01$. Additionally, experiences of not having enough time were negatively correlated with experiences of having too much time, $rho = -.16$, $p < .05$ (see Table 2).

Latent class analysis

A LCA was carried out to assess participants' temporal experiences during the first year of the pandemic. Models were tested with an increasing number of latent classes. Models were compared for best fit using higher entropy values

Table 3. Model fit indices for latent class analysis model selection.

Model	AIC	BIC	SABIC	Entropy	Smallest class (%)	LMR *p*	BLRT *p*
1	5386.31	5494.48	5399.36	–	–	–	–
2	5273.45	5493.40	5299.99	0.99	7.7%	0.00	0.00
3	5197.15	5528.88	5237.18	0.83	6.9%	0.84	0.00
4	5152.10	5595.62	5205.62	0.86	7.3%	0.76	0.00
5	5120.45	5675.75	5187.45	0.87	8.4%	0.76	0.00
6	5113.38	5780.45	5193.87	0.85	7.7%	0.77	0.03

Abbreviations: AIC, Akaike Information Criterion; BIC, the Bayesian Information Criterion; SABIC, Sample-Size Adjusted Bayesian Information Criterion; LMR, Lo-Mendell-Rubin; BLRT, Bootstrapped Likelihood Ratio Test.

(ranging from 0 to 1) and lower BIC values. The Lo-Mendell-Rubin (LMR) test and Bootstrapped Likelihood Ratio Test (BLRT) were used to compare each model to that with one fewer class.

To determine the LCA model, six models with different numbers of latent classes were estimated and compared (see Table 3). Model fit indices were assessed for two-, three-, four-, five-, and six-class models, with a two-class model selected for the best fit (see Table 3). The two-class model had the highest entropy value (0.99), which indicated the best fit compared to the three-class (0.83), four-class (0.86), five-class (0.87), and six-class (0.85) models. The two-class model also has the lowest BIC value (5493.40), compared to the one-class (5494.48), three-class (5528.88), four-class (5595.62), five-class (5675.75), and six-class (5780.45) models. Further, the two-class model was the only one of the assessed models that had a statistically significant LMR ($p < .01$). The statistically significant result here indicates that the two-class model is a better fit for the data compared to a one-class model.

The two-class model yielded distinct temporal profiles characterized by varying perceptions of routine changes, passage of time, and quantity of time judgments. Class 1 was labeled Varied Time Changes, based on the wide variety of temporal changes participants reported during the pandemic (92.3%). Participants in this class reported perceptions that time was passing faster and slower during the pandemic. They reported changes in their daily routines, with only a few suggesting their routines had not changed a lot. While some participants in this class reported having less time available during the pandemic, others reported no change or having a lot more time. Similarly, this group varied in their experiences of not having enough time and having too much time during the pandemic, with their range of experiences reported as occurring rarely to very often.

Class 2 was labeled Minimal Perceived Changes, as class membership (7.7%) was characterized by reports of minimal changes to time during the pandemic.

Participants in this class reported that their daily routines did not change or only changed slightly, and that passage of time generally remained the same. They further reported that their perceptions of quantity of time did not change or only increased slightly, and that increased experiences of not enough time and too much time occurred only rarely during the pandemic.

Demographic variables were compared across the two classes to observe any differences in group membership. An independent samples t-test indicated that there was a statistically significant difference in average age between Varied Time Changes and Minimal Perceived Changes, $t_{(268)} = 4.16$, $p < .01$. Varied Time Changes had an average age of 26.89 ($SD = 11.36$), while Minimal Perceived Changes averaged 37.86 ($SD = 14.28$). Chi-square difference tests indicated no statistically significant differences of gender ($p = .91$), employment status ($p = .12$), relationship status ($p = .03$), living with children ($p = .56$), country of residence ($p = .15$), living arrangements (alone or cohabitating; $p = .81$), living space (e.g., urban, rural; $p = .95$), and current restrictions ($p = .18$) across the classes.[1]

The latent classes and their respective RTAs are presented in Figure 1.

Class one: Varied time changes

The RTA of open-ended responses from the Varied Time Changes class resulted in the development of the following themes: (1) Difficulty orienting in time, (2) "No set times" and (3) "My life isn't moving forward."

Theme one: Difficulty orienting in time. This theme observes a sense of disorientation that participants described in their experiences of time during the pandemic. Changes in daily life appeared to create a distorted sense of time. As one participant explained: "*it feels like the normal flow of time stopped with the normal flow of life*" (100). Without a "normal flow of time", participants explained a disorientation where: "*Everything runs together. I can't remember what I did last week. What I ate yesterday. What day it is*" (145). Participants further described how this disorientation involved changes in time's pacing. As one participant explained:

> Much like the film 'Groundhog Day,' each day feels the same as the preceding one. There is little variation and it feels more like entering a form of stasis. In the moment, time seems to pass slow, but looking back it feels like the last year has passed so quickly as there are so few events that mark the passing of time. (195)

Participants were perplexed as they perceived time moving paradoxically slowly and quickly. To make sense of this, they described the daily monotony and "little variation" that contributed to time "in the moment" passing slowly.

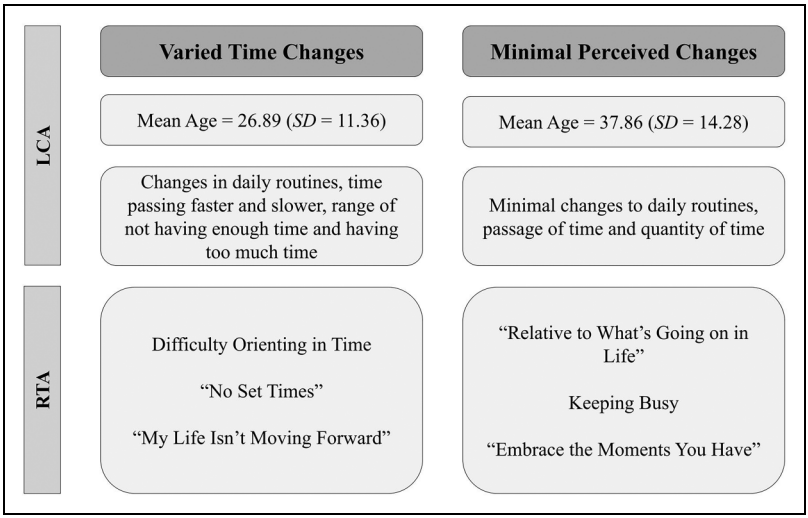

Figure 1. Overview of mixed methods results.

However, the overall year passed quickly as participants pointed to there being "so few events that mark the passing of time". Participants further described how they would have normally used distinct events to orient themselves in time:

> I feel that it is harder to keep track of time passing or recall when things happened, as there are so few "markers" e.g., normally I would put things in context, such as 'that happened before we went away for the weekend/before somebody's birthday party'. (33)

Here, the participant described how an event such as a birthday party would serve as a chronological "marker" to help them "put things in context" and "recall" experiences. In the absence of these clear temporal markers, participants found it harder to "keep track of time" as they once would have. Participants further explained: "*I keep referring to something that actually happened a long time ago (aka 3 months ago) as 'last week'*" (222). This speaks to how the disorientation participants experienced warped their ability to maintain a clear temporal narrative of this period.

As participants responded to the pandemic, they did so with a feeling that a "normal flow of time" had ceased. This normal flow of time was disrupted by the removal of typical activities and events that participants relied on to orient themselves in the passage of time. Without these clear markers of time passing, participants described an ongoing sense of disorientation that extended across their memories of the first year of the pandemic.

Theme two: "No set times". When explaining their experiences of temporal changes during the pandemic, many Class One participants referred to changes in routines that made it feel as though, "*there's no real difference between 9am and 2pm and 10pm"* (100). Where participants might once have looked to the clock to help dictate activity engagement, routine disruptions resulted in a temporal flexibility that left participants detached from the clock's timekeeping. As one participant explained:

> [Time] has less meaning. Don't know what day [it] is most of the time. Don't necessarily sleep at night but rather when I am tired. Doing things based on a time of day has become an abstract concept. (197)

Here, time lost its "meaning" as participants no longer relied on it to structure daily activities. As a result, activities were devoid of temporal cues such as "what day it is" and "time of day" that were once used as guides. For some participants, certain roles and responsibilities maintained temporal structure: "*only time I need to keep track of is my working hours apart from that time is irrelevant*" (200). However, in general, the need to keep track of time and maintain routine felt diminished, leading to time becoming "irrelevant".

Amid this decoupling of time and activity, participants described experiences of constant work urgency, more stress, difficulty prioritizing, and increased procrastination. Participants reported changes in routines that involved more sedentary activities, either more or less time outdoors in nature, more time using technology, and less consistent sleep and eating schedules. A lack of clear structure made time feel endless. This led participants to feel there was always more they could or should be doing with their time. It also contributed to reports of being easily distracted and bored and finding it difficult to focus. Participants described how this temporal flexibility impacted their sense of productivity:

> I am less productive and get less done because I feel like tasks can be completed at any time compared to before when I knew I had to take any available window in my schedule to get something done. (187)

As tasks were less temporally bounded and constrained by other scheduled activities, it became more difficult to actually "get something done". Without a consistent sense of structure, some participants used humor to express their experiences:

> Well, this morning I woke up to my neighbour chainsawing something frantically at 9am. Checked my emails to realise I have a maths exam today. It's never a good start is it? (173)

Where theme one emphasized the role of events in marking the passage of time, theme two captures the role time played in guiding activities. Both relationships between time and activity were disrupted for participants in this class, contributing to the variety of temporal changes they reported during the pandemic.

Theme three: "My life isn't moving forward". Varied Time Changes participants appeared to struggle with a feeling of being stuck, in part created by a sense that they could not use their time meaningfully during the pandemic. Perhaps related to changes in routines explored in the previous theme, participants described feeling that they had more time that they needed to try to fill during the pandemic.

> Trying to fill all the time. Using social media or television to fill the spaces. Feeling large gaps where I'd normally see friends, go shopping, go hiking, be social and feeling the need to try to fill it. (145)

Varied Time Changes participants appeared to focus on the experience of having extra time, in part fueled by a fixation on the absence of activities that had previously filled their time such as "friends," "shopping," and "hiking." As another participant explained: "*I have had time but nothing that I want to spend it on. It's kind of upsetting*" (175). Here, it is the perceived imbalance between the amount of time available and the lack of things to do with the time that elicited a negative emotional response. Similarly, other participants described this experience, saying it led to feeling "*useless*" (57), and "*more lonely/less of a purpose*" (20).

Some participants reflected further that it was the sense of not being able to use time meaningfully that felt problematic:

> For me it is not so much having too much time its more not having meaningful time. There is just an endless monotony where it's hard to feel like I'm accomplishing anything. (258)

Here, it is the feeling that time cannot be actualized within the monotony described in previous themes. As a result, there is paradoxically too much time and not enough time as time cannot be used well and thus does not feel satisfying. This contributed to a feeling that time was moving on without them and beyond their control. As one participant described:

> It feels like I can't control the passing of time, and I'm running out of time to do the things I want to do before I miss out on this time of my life. (161)

Participants described how personally meaningful events like travel, going to college, and spending time with family and friends were lost to enduring

restrictions and lockdowns. Participants appeared to compare their pandemic reality to an alternate, imagined version of this time period that involved milestones and events that could have or should have happened had the pandemic not occurred.

These imagined alternatives seemed to heighten participants' discontent with their pandemic experiences.

> I'm supposed to be living my best life at this age and I'm stuck in my room. (28)

This speaks to expectations and visions of what is meant to happen during certain periods of life. As the reality of pandemic times was weighed against these expectations, participants felt they were missing out on what was meant to occur, sometimes irreparably.

> I sometimes feel like my life isn't moving forward because of the pandemic and hence in some way I am "wasting" my time in life (not able to work and save more money, not able to explore new places and meet new people etc.). (151)

Overall, this theme captures participants' sense of being stuck during the pandemic, as if time was available, but was out of their control, and could not be used meaningfully.

Class two: Minimal perceived changes

When describing their experiences of time during the first year of the pandemic, Class Two participants were likely to report minimal perceived changes. The RTA of their open-ended responses resulted in the construction of the following themes: (1) "Relative to what's going on in life" (2) Keeping busy, and (3) "Embrace the moments you have."

Theme one: "Relative to what's going on in life". One pattern that appeared to contribute to participants' reports of minimal time changes relates to the ways in which participants made sense of time as something dynamic and malleable. Many described initial changes at the beginning of the pandemic that eventually "*levelled out*" (5). As one participant explained:

> I thought the month of April … felt like the longest month ever, but from mid-May … time started to speed up again and it's been back to normal ever since. (102)

Here, the participant referred to the first few months of the pandemic to describe changes they experienced. However, these changes did not appear to last for long, with time returning to "normal" after several months. One reason

participants described for time's return to normal was a sense that "*life goes on*" (165). As one participant explained:

> I also work full-time and I'm wrapping up a master's degree. So time has slowed, quickened and everything in between, relative to what's going on in life. (271)

Though participants might have initially experienced changes at the start of the pandemic, they indicated that other life experiences, such as working full-time and completing a master's degree, also influenced their temporal experiences. Experiences of time were thus seen as "relative to what's going on in life." This relativity appeared to normalize pace malleability. As the roles and activities that occupied time ebbed and flowed, so too did the pace at which time appeared to move. The pandemic, then, might have been perceived as just one of many factors that influenced the dynamic pace of time for these participants.

Theme two: Keeping busy. This second theme examines how participants appeared to actively maintain routines and keep themselves busy. Participants explained that between work, household/childcare, and leisure activities, they always had plenty to do. In their descriptions of time during the pandemic, one participant said, "*Back to normal - flying by in the blink of an eye!*" (102). Many described regularly not having enough time, explaining that this experience during the pandemic, "*hasn't changed at all… I simply constantly feel I don't have enough*" (265). It appeared that time moving quickly and feelings of not having enough time were the norm for these participants. With multiple roles and responsibilities, participants seemed used to filling their time, which was a habit they perpetuated during the pandemic. As a result of maintaining their busyness, participants did not perceive this period to differ from previous temporal experiences.

Participants appeared to take an active role in maintaining previous habits and norms. As one participant described: "*I kept to a routine as best I could and tried to organise my time as if we were not in a lockdown*" (7). Here, participants actively responded to any changes brought on by the pandemic by creating and maintaining routines to facilitate a sense of normalcy. Where participants felt they had extra time resulting from the pandemic, they simply allocated it to additional activities: "*I have used my spare time for extra chores and hobbies*" (7). For participants in Class Two, any changes resulting from the pandemic could simply be addressed through the redistribution of temporal resources in order to keep busy. Thus, time remained largely occupied in activity, lending to a sense of consistency throughout the pandemic.

Theme three: "Embrace the moments you have". When reflecting on time during the pandemic, Minimal Perceived Changes participants seemed less focused on ruminating over changes and more concerned about making the most of their

time. This response to the pandemic appears to be influenced by the ways in which participants valued their time as something "*borrowed*," "*fragile*," and "*precious*". These descriptions express a sense of time's finitude. By focusing on time's finite nature, participants described an enhanced focus on "*embrac[ing] the moments you have*" (165).

Although the previous theme aimed to capture participants' tendencies to actively fill their time across various roles and responsibilities, participants also spoke about valuing the present moment and recognizing temporal limitations. As one participant said, "*But then, who does accomplish everything they ever wanted to do?"* (264). In this, participants expressed trying not to stress about what had happened in the past, what was not happening in the present due to the pandemic, and what was to come in the future. Instead, participants described a desire to "embrace" their time for what it was. As one participant explained:

> I just try to value all the time that I've been given as much as possible, because this fragility has really shown us the value of time and life in general … (102)

The experiences of the pandemic appeared to heighten a sense of time's "fragility" and thus exacerbated participants' drive to value what they have by not taking it for granted.

Discussion

This mixed methods study aimed to explore individuals' subjective experiences of time during the COVID-19 pandemic. Taking a multifaceted approach, the study evaluated participants' perceptions of changes in daily routines, passage of time and quantity of time. The results showed notable associations between experiences of time, as well as a two-class latent structure that effectively captured distinct temporal groups. Participants' open-ended survey responses were divided and analyzed based on these distinct temporal classes, resulting in nuanced insights into each class' temporal experiences.

Individual characteristics and experiences of time

As the study aimed to investigate associations between experiences of time and individual characteristics, the dataset presented a range of participants across demographic categories. Though individuals from 18 to 78 years of age participated in the study, the mean age of 27.74 does indicate a relatively young sample. Across demographic variables, those who were older were more likely to be employed, in a relationship and living with their partner, and living alone (compared to those living with others). As previously noted, convenience sampling

recruitment strategies meant that participant recruitment calls went out largely to the research team's network, resulting in a dataset primarily residing in Ireland and the United States. Perhaps due to recruitment going out through university channels in Ireland, those living in Ireland were significantly younger than those living elsewhere. As those living in the United States were significantly older, they were also more likely to be employed and living with children. There were also significant associations between country of residence and level of public health restrictions reported. This is understandable when looking at the differences in the nature and stringency of public health measures imposed within Ireland and the United States (Unruh et al., 2022), with Ireland's restrictions being some of the strictest in the world (Brent, 2021).

The study's findings corroborate a body of literature observing associations between experiences of time and individual characteristics (e.g., Andersson et al., 2023; Bhattacharjee and Mogilner, 2014; Bó, 2022; Bó and Dukhovnov, 2022; Giurge et al., 2021; Ogden, 2020). Specifically, across the dataset, those who were older, employed, in a relationship, and facing fewer public health restrictions reported fewer and less extreme changes to their experiences of time during the first year of the pandemic. Those in Ireland, facing greater public health restrictions, were also more likely to report greater changes to their experiences of time. Interestingly, those in a relationship reported fewer experiences of having too much time. These findings further promote the complexity of experiences of time, demonstrating how these temporal experiences can be associated with a variety of life circumstances which may impact how individuals experience larger collective periods of change.

Correlations between time variables

The multifaceted approach to experiences of time allowed for the evaluation of associations between perceptions of changes in daily routines, passage of time, and quantity of time. Perhaps understandably, those who felt time had changed during the pandemic were also likely to report greater changes to their daily routines. Notably, while perceived changes in daily routines were not significantly associated with changes in passage of time, those who reported changes in their daily routines were likely to report having more time, and too much time, during the pandemic. Additionally, perceptions of time moving faster were associated with greater experiences of not having enough time, while perceptions of time moving slower were associated with greater experiences of having too much time. These findings are similar to previous studies that have found associations between passage and quantity judgments (Andersson et al., 2023; Cravo et al., 2021; Waller et al., 2001) and contribute to our understanding of temporal experiences as complex and multifaceted by suggesting that how much time we perceive to be available may relate to how we perceive our routines and

how quickly or slowly time appears to move. Rather than solely calculating objective quantities of time, these findings demonstrate the importance of people's subjective appraisals of time's availability within their temporal profile. As experiences of time are often investigated individually (Andersson et al., 2023), the current findings support greater use of a multidimensional approach when evaluating subjective experiences in the future.

Identifying temporal classes

The study identified two distinct temporal classes within the dataset: Varied Time Changes and Minimal Perceived Changes. Each class was differentiated by their perceptions of changes in routines, passage and quantity of time during the pandemic. The Varied Time Changes class represented a majority of participants in the dataset. The class was characterized by a variety of perceived changes to routines, passage of time, and quantity of time during the pandemic. Further, the RTA revealed that the Varied Time Changes group expressed disorientation and an altered sense of time due to the lack of typical markers indicating a clear passage of time. This group further described a distorted sense of time as it no longer served to structure their days, leaving activities to occur without the temporal restraints of a "normal" schedule. Finally, participants in the Varied Time Changes class were preoccupied with a sense that they could not fully make the most of their time due to the changes and restrictions brought on by the pandemic. In contrast, the Minimal Time Changes group emphasized that change is normal, and that by keeping busy, maintaining routines, and making the most of their time, they had experienced minimal changes to their experiences of time during the pandemic.

Interestingly, previous studies have similarly identified small portions of participants who did not report temporal changes. Within the COVID-19 pandemic literature, for example, Ogden (2020) noted that 19% of 604 UK-based survey respondents reported time passing normally in the first months of the pandemic. Similarly, 26% of 853 respondents reported a normal passage of time over the first eight months of the pandemic (Ogden, 2021). However, these quantitative studies proceeded to focus on describing a collective sense of temporal changes observed in the majority of individuals represented in these datasets. Beyond the COVID-19 pandemic context, studies such as Flaherty et al. (2005), which observed perceptions of time during the political and economic crisis in Argentina in 2002, also found that a small portion of participants reported their perceptions of the passage of time had not changed. Similar to the findings in the current study, Flaherty et al.'s (2005) qualitative insights found that those reporting no changes often referred to the sense that their personal circumstances had not significantly changed amid the larger social unrest.

In the current study, by evaluating both multiple perceptions of time as well as collecting quantitative and qualitative data, we were able to present detailed temporal profiles characterized by different experiences of time during the pandemic. Qualitative analyses further enabled an investigation into how participants described their experiences of time, allowing for greater understanding of both how people did and did not experience changes.

Comparing temporal classes

Age was the only demographic variable that varied significantly between the two temporal classes, with Minimal Time Changes significantly older than Varied Time Changes. Early in the pandemic, trauma researchers predicted those with less situational stability (e.g., young people) would experience greater disruption in the wake of the pandemic and corresponding public health measures (Holman and Grisham, 2020). Subsequent research has confirmed these predictions, specifically finding that young adults, compared to older age groups, have been more severely impacted by psychosocial changes and uncertainties arising in work, education, and social resources during the pandemic (e.g., Kujawa et al., 2020; Marroquín et al., 2020; Postill et al., 2024).

In the current findings, the younger Varied Time Changes group described greater temporal changes that arose through routine disruptions and feelings that they could not use their time meaningfully. In contrast, we might interpret that the older Minimal Perceived Changes participants were in more stable, predictable life circumstances that buffered against the uncertainties of the pandemic and contributed to greater consistency in their temporal experiences. Indeed, across the dataset as a whole, characteristics that might indicate greater stability (e.g., relationship status, employment) were positively associated with age, with older individuals more likely to be employed, in a relationship, and living with their partner. However, these demographic variables did not differ significantly across the two classes. While these aspects of predictable life circumstances may have played a role in participants' temporal experiences, it is additionally possible that Minimal Perceived Changes participants subjectively experienced greater stability in their circumstances. Indeed, their qualitative responses suggested that they placed greater focus on maintaining routines and staying busy, which contributed to experiencing greater temporal normalcy.

Attention to, and satisfaction derived from, ordinary experiences might also account for differences between the temporal classes. Research suggests that as people age, they may view time as scarcer and be more likely to value and savor ordinary experiences (Gino and Mogilner, 2014; Mogilner et al., 2011). In contrast, younger individuals are more likely to view their time and future as expansive and place greater value on unique and novel experiences (Bhattacharjee and Mogilner, 2014). From the qualitative analyses, Minimal

Perceived Changes' focus on routine and valuing time as finite might have led them to place greater emphasis on ordinary experiences that they could maintain throughout the pandemic. This emphasis on ordinary experiences could have led to a greater sense of coherence and consistency (Heintzelman and King, 2019) and contributed to experiences of minimal temporal changes. Varied Time Changes participants, contrastingly, described the importance of missing out on experiences such as travel, relationships, and social experiences, and how this loss influenced their temporal experiences. Their focus on the loss of these experiences reflects literature on biographical disruptions (Bury, 1982), which recognizes that illnesses and other experiences that change expected life experiences can result in disruption in one's sense of identity and life trajectories (Postill et al., 2024). For Varied Time Changes participants, the pandemic appeared to disrupt experiences that they expected in this period of their lives, which contributed to their experience of temporal changes.

These findings are important in their acknowledgement that not everyone experienced the pandemic in the same ways. Those who experienced a greater sense of disruption in their routines and life trajectories may have been more likely to have experienced temporal changes. The age difference between the two classes suggests that these disruptions were more prominent for younger participants. However, the wide age range across both temporal classes (18–78 and 20–78, respectively) suggests that disruptions and changes in temporal experiences could and did occur across age groups.

Strengths, limitations, and future directions

The study's mixed methods design served as a key strength of this work. Previous pandemic-related literature has primarily employed variable-centered approaches to quantitative analyses, which focus on a sample as a single population in which averaged parameters can be evaluated (Morin et al., 2016). The current study's use of person-centered LCA and qualitative RTA served as an innovative approach which allowed for the identification and in-depth investigation of distinct subgroups within the current sample. These approaches offered valuable insights and considerations for understanding multifaceted, subjective experiences of time during the COVID-19 pandemic and advanced methodological diversity in pandemic-related research. Beyond the pandemic context, the study's methodological approach promotes future use of mixed methods and person-centered analyses when investigating subjective experiences of time.

When reviewing the LCA findings of the current study, it is worth noting the difference in sizes between the two temporal classes. Minimal Perceived Changes represents only 7.7% ($n = 21$) of the current dataset. While the two-class model was the best fit and this percentage is within the range of a distinct and identifiable class for a LCA (Ferguson et al., 2019; Marsh et al., 2009), it is a

relatively small sample to compare against the 251 participants in Varied Time Changes. Though not inherently a limitation, this distinction is an important consideration when interpreting the results.

A key aim of the study was to evaluate differences in demographic variables across the distinct temporal classes identified. The resulting diversity in the sample composition allowed for this investigation, however, it is worth noting that this high demographic variability and the relatively small sample size may limit the generalizability and comparability of the results.

Furthermore, though participants ranged from 18 to 78 years of age, the average age was 27.74. This demographic characteristic was perhaps, in part, influenced by the use of an online survey and some of recruitment relying on university channels. Again, while not inherently a limitation, it is important to consider this demographic factor when interpreting the results, and to consider the merit of engaging with wider age groups in future studies. As age was the only demographic factor to vary significantly across the temporal classes, future studies may aim to engage with particular age groups for in-depth investigation into their experiences of time within various contexts.

Further, the survey did not collect data on potential outcome measures which could have been used to observe further distinctions within the temporal classes. Previous research has demonstrated links between experiences of time and various mental health and wellbeing variables (e.g., Andersson et al., 2023; Bu et al., 2021; Loose et al., 2022; Martinelli et al., 2021), and similar associations might have been observed within the current sample. However, the current study's aim was to identify and analyze a multidimensional profile of experiences of time, particularly through a variety of quantitative and qualitative measures. While this does limit the identification and reporting of potential associations between temporal classes and wellbeing, it does not devalue the importance of the available results. Future research could further evaluate multidimensional temporal profiles and their distinct mental health correlates. This would build on our understanding of how multifaceted experiences of time relate and contribute to mental health and wellbeing. As the current study demonstrated that participants had different temporal experiences in the wake of the COVID-19 pandemic, further investigation of multifaceted experiences of time could offer a richer understanding of how people adapt to changing circumstances. Such research would not only enhance our understanding of how experiences of time and individual differences relate to daily functioning, but also help identify specific groups who would benefit from additional supports and resources when navigating change.

Conclusion

The COVID-19 pandemic was a unique context in which to investigate experiences of time. Taking a multidimensional approach to measuring experiences

of time and a mixed methods, person-centered approach to evaluating these temporal experiences, the current study found that people experienced time differently during the pandemic and further identified patterns across these experiential differences. Experiential differences related to age, engagement in routines, and perceptions of time as valuable and something that could (or could not) be used meaningfully give insight into what influenced temporal experiences during the first year of the pandemic. These findings contribute to understandings of the complexity of temporal experiences under periods of prolonged uncertainty, highlighting the importance of personal context in shaping one's response to broad social disruptions.

ORCID iDs

Anna Navin Young https://orcid.org/0000-0003-3591-3929
Llewellyn E. van Zyl https://orcid.org/0000-0003-3088-3820
Eithne Hunt https://orcid.org/0000-0001-8763-0408

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

New paper statement

We confirm the paper has not been published elsewhere and is not under consideration in any other publication.

Supplemental material

Supplemental material for this article is available online.

Note

1. Interactions between age and the other demographic variables measured between classes have been considered. However, due to the small sample distribution in latent class two, these results are not presented in the main manuscript and are instead presented in Supplemental Material A.

References

Adam B (2022) Thirty years of time & society: The challenges for time studies revisited. *Time & Society* 31(1): 6–9.

Aeon B, Giurge LM and Whillans A (2020) Toward a theory of subjective time. *Academy of Management Proceedings* 2020(1): 21362.

Andersson MA, Froese P and Bó BB (2023) Out of time, out of mind: multifaceted time perceptions and mental wellbeing during the COVID-19 pandemic. *Time & Society* 33(1): 69–94.

Bailey S, Bastian M, Coleman R, et al. (2020) A day at a time: a research agenda to grasp the everyday experience of time in the COVID-19 pandemic. *Discover Society Online magazine*.

Batur I, Dirks AC, Bhat CR, et al. (2023) Analysis of changes in time use and activity participation in response to the COVID-19 pandemic in the United States: implications for well-being. *Transportation Research Record: Journal of the Transportation Research Board* 2678(12): 512–526.

Bhattacharjee A and Mogilner C (2014) Happiness from ordinary and extraordinary experiences. *Journal of Consumer Research* 41(1): 1–17.

Bó B (2022) Time availability as a mediator between socioeconomic status and health. *SSM - Population Health* 19: 101238.

Bó B and Dukhovnov D (2022) Tell me who's your neighbour and I'll tell you how much time you've got: the spatiotemporal consequences of residential segregation. *Population, Space and Place* 28(7): e2561.

Boniwell I (2006) *Satisfaction with time use and its relationship with subjective well-being*. PhD Thesis, The Open University, UK. DOI: 10.21954/ou.ro.0000e971.

Braun V and Clarke V (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2): 77–101.

Braun V and Clarke V (2019) Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health* 11(4): 589–597.

Braun V, Clarke V and Weate P (2016) Using thematic analysis in sport and exercise research. In: Smith B and Sparkes AC (eds) *Routledge Handbook of Qualitative Research in Sport and Exercise*. Routledge, pp.191–205.

Brent H (2021) Ireland's coronavirus lockdown ranked toughest in Europe, and 4th toughest in the world. *The Irish Post*, February 23.

Bu F, Steptoe A, Mak HW, et al. (2021) Time-use and mental health during the COVID-19 pandemic: a panel analysis of 55,204 adults followed across 11 weeks of lockdown in the UK. *The British Journal of Psychiatry* 219(4): 551–556.

Bury M (1982) Chronic illness as biographical disruption. *Sociology of Health & Illness* 4(2): 167–182.

Celeux G and Soromenho G (1996) An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification* 13: 195–212.

Cellini N, Canale N, Mioni G, et al. (2020) Changes in sleep pattern, sense of time and digital media use during COVID-19 lockdown in Italy. *Journal of Sleep Research* 29(4): e13074.

Clark S, McGrane A, Boyle N, et al. (2021) "You're a teacher you're a mother you're a worker": gender inequality during COVID-19 in Ireland. *Gender, Work & Organizations* 28(4): 1352–1362.

Cravo AM, de Azevedo GB, Bilacchi CM, et al. (2021) Time experience in social isolation: a longitudinal study during the first months of COVID-19 pandemic in Brazil. *PsyArXiv*. DOI: 10.31234/osf.io/6jg4r.

Creswell JW (2011) When should I choose a mixed methods approach? *Sage Research Methods*. DOI: 10.21954/ou.ro.0000e971.

Denovan A and Dagnall N (2019) Development and evaluation of the chronic time pressure inventory. *Frontiers in Psychology* 10(2717). DOI: 10.3389/fpsyg.2019.02717.

Droit-Volet S, Gil S, Nartinelli N, et al. (2020) Time and COVID-19 stress in the lockdown: Time free <> of boredom and sadness. *PLoS One* 15(8): e0236465.

Droit-Volet S, Martinelli N, Chevalère J, et al. (2021) The persistence of slowed time experience during the COVID-19 pandemic: Two longitudinal studies in France. *Frontiers in Psychology* 12: 721716.

Droit-Volet S, Martinelli N, Dezecache G, et al. (2023) Experience and memory of time and emotions two years after the start of the COVID-19 pandemic. *PLoS One* 18(9): e0290697.

Ferguson SL, Moore EWG and Hull DM (2019) Finding latent groups in observed data: A primer on latent profile analysis in Mplus for applied researchers. *International Journal of Behavioral Development* 44(5): 458–468.

Flaherty M (2018) An S-shaped pattern in the perceived passage of time: How social interaction governs temporal experience. *Language and Cognition* 10: 1–25.

Flaherty M (2022) Whose time is it? Negotiating temporality in everyday life. *Time & Society* 31(1): 22–24.

Flaherty M, Freidin B and Sautu R (2005) Variation in the perceived passage of time: A cross-national study. *Social Psychology Quarterly* 68(4): 400–410.

Gershuny J, Sullivan O, Sevilla A, et al. (2021) A new perspective from time use research on the effects of social restrictions on COVID-19 behavioral infection risk. *PLoS One* 16(2): e0245551.

Gino F and Mogilner C (2014) Time, money, and morality. *Psychological Science* 25(2): 414–421.

Giurge LM, Whillans AV and West C (2020) Why time poverty matters for individuals, organisations and nations. *Nature Human Behaviour* 4: 993–1003.

Giurge LM, Whillans AV and Yemiscigil A (2021) A multicountry perspective on gender differences in time use during COVID-19. *Proceedings of the National Academy of Sciences* 118(12): e2018494118.

Heintzelman SJ and King LA (2019) Routines and meaning in life. *Personality and Social Psychology Bulletin* 45(5): 688–699.

Holman EA and Grisham EL (2020) When time falls apart: The public health implications of distorted time perception in the age of COVID-19. *Psychological Trauma: Theory, Research, Practice, and Policy* 12(1): S63–S65.

Howard MC and Hoffman ME (2018) Variable-centered, person-centered, and person-specific approaches: Where theory meets the method. *Organizational Research Methods* 21(4): 846–876.

IBM Corp (2019) *IBM SPSS for Macintosh*, Version 26.0. IBM Corp.

Jokic T, Zakay D and Wittmann M (2018) Individual differences in self-rated impulsivity modulate the estimation of time in a real waiting situation. *Timing & Time Perception* 6(187): 71–89.

Krajewski M, Rogowski Ł and Frąckowiak M (2023) Facing arrhythmia: Reconstructing time in the pandemic by the metropolitan creative classes in Poland. *The British Journal of Sociology* 74(3): 433–452.

Kujawa A, Green H, Compas BE, et al. (2020) Exposure to COVID-19 pandemic stress: Associations with depression and anxiety in emerging adults in the United States. *Depression and Anxiety* 37(12): 1280–1288.

Lee I and Tipoe E (2021) Changes in the quantity and quality of time use during the COVID-19 lockdowns in the UK: who is the most affected? *PLoS One* 16(11): e0258917.

Levine RV (1997) *A Geography of Time: The Temporal Misadventures of a Social Psychologist or How Every Culture Keeps Time just a Little Bit Differently*. Basic Books.

Loose T, Wittmann M and Vásquez-Echeverría A (2022) Disrupting times in the wake of the pandemic: Dispositional time attitudes, time perception and temporal focus. *Time & Society* 31(1): 110–131.

Lundström M (2022) Synchronization of the corona crisis. *Time & Society* 31(3): 317–334.

Marroquín B, Vine V and Morgan R (2020) Mental health during the COVID-19 pandemic: Effects of stay-at-home policies, social distancing behavior, and social resources. *Psychiatry Research* 293: 113419.

Marsh HW, Lüdtke O, Trautwein U, et al. (2009) Classical latent profile analysis of academic self-concept dimensions: synergy of person-and variable-centered approaches to theoretical models of self-concept. *Structural Equation Modeling: A Multidisciplinary Journal* 16: 191–225.

Martinelli N, Gil S, Belletier C, et al. (2021) Time and emotion during lockdown and the COVID-19 epidemic: determinants of our experience of time? *Frontiers in Psychology* 11: 616169.

Mogilner C, Kamvar SD and Aaker J (2011) The shifting meaning of happiness. *Social Psychological and Personality Science* 2(4): 395–402.

Morin AJS, Gagné M and Bujacz A (2016) Call for papers: person-centred methodologies in the organizational sciences. *Organizational Research Methods* 19: 8–9.

Muthén LK and Muthén BO (1998-2018) *Mplus user's guide* (8th ed.). Muthén & Muthén.

Ogden R (2020) The passage of time during the UK COVID-19 lockdown. *PLoS One* 15(7): e0235871.

Ogden R (2021) Distortions to the passage of time during England's second national lockdown: a role for depression. *PLoS One* 16(4): e0250412.

Orlikowski WJ and Yates J (2002) It's about time: temporal structuring in organizations. *Organization Science* 13(6): 684–700.

Postill G, Halpin M, Zanin C, et al. (2024) 'I've never been so stressed in my life': A qualitative analysis of young adults' lived experience amidst pandemic restrictions in Prince Edwards Island, Canada. *BMJ Open* 14: e075567.

Qualtrics (2020) *Qualtrics*. Qualtrics. https://www.qualtrics.com.

Restubog SLD, Ocampo ACG and Wang L (2020) Taking control amidst the chaos: Emotion regulation during the COVID-19 pandemic. *Journal of Vocational Behavior* 119: 103440.

Ruse JN, Rhodes P, Tateo L, et al. (2023) Remaking time: Cultural semiotic transformations of temporality during the early days of the COVID-19 pandemic and lockdown. *Integrative Psychological and Behavioral Science* 57(1): 235–255.

Sharif MA, Mogilner C and Hershfield HE (2021) Having too little or too much time is linked to lower subjective well-being. *Journal of Personality and Social Psychology: Personality Processes and Individual Differences* 121(4): 933–947.

Sharma S (2022) Undisciplined time studies. *Time & Society* 31(1): 44–47.

Shipp AJ and Jansen KJ (2021) The "other" time: a review of the subjective experience of time in organizations. *Academy of Management Annals* 15(1): 299–334.

Spurk D, Hirschi A, Wang M, et al. (2020) Latent profile analysis: A review and "how to" guide of its application within vocational behavior research. *Journal of Vocational Behavior* 120: 103445.

Tein JY, Coxe S and Cham H (2013) Statistical power to detect the correct number of classes in latent profile analysis. *Structural Equation Modeling: A Multidisciplinary Journal* 20: 640–657.

Unruh L, Allin S, Marchildon G, et al. (2022) A comparison of 2020 health policy responses to the COVID-19 pandemic in Canada, Ireland, the United Kingdom and the United States of America. *Health Policy* 126(5): 427–437.

Velasco PF, Perroy B, Gurchani U, et al. (2022) Experiencing a slow passage of time was an indicator of social and temporal disorientation during the COVID-19 pandemic. *Scientific Reports* 12: 22338.

Waller MJ, Conte JM, Gibson CB, et al. (2001) The effect of individual perceptions of deadlines on team performance. *The Academy of Management Review* 26(4): 586–600.

Wasti SP, Simkhada P, van Teijlingen ER, et al. (2022) The growing importance of mixed-methods research in health. *Nepal Journal of Epidemiology* 12(1): 1175–1178.

Wearden J (2016) *The Psychology of Time Perception*. Macmillan Publishers.

Wearden J, O'Donoghue A, Odgen R, et al. (2014) Subjective duration in the laboratory and the world outside. In: Arstila V and Lloyd D (eds) *Subjective Time: The Philosophy, Psychology, and Neuroscience of Temporality*. MIT Press, pp. 287–306.

Wearden JH (2003) Applying the scalar timing model to human time psychology: Progress and challenges. In: Helfrich H (ed) *Time and Mind II: Information Processing Perspectives*. Hogrefe & Huber Publishers, pp.21–39.

Wittmann M (2020) Subjective passage of time during the pandemic: Routine, boredom, and memory. *Kronoscope* 20(2): 260–271.

Wittmann M, Rudolph T, Linares Gutierrez D, et al. (2015) Time perspective and emotion regulation as predictors of age-related subjective passage of time. *International Journal of Environmental Research and Public Health* 12(12): 16027–16042.

Zakay D and Block RA (1997) Temporal cognition. *Current Directions in Psychological Science* 6(1): 12–16.

Zimbardo PG and Boyd J (2008) *The Time Paradox: The New Psychology of Time That Will Change Your Life*. Simon and Schuster.