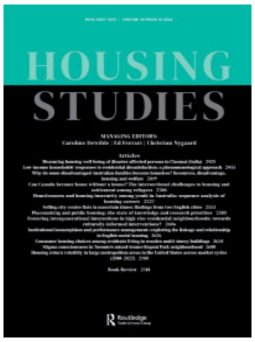

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Differences and similarities in student residential mobility during the COVID-19 pandemic in Temuco and Montréal

José Prada-Trigo[a], Nick Revington[b] and Irene Sánchez-Ondoño[a,c]

[a]Department of Geography, University of Valladolid, Valladolid, Spain; [b]Institut National de la Recherche Scientifique, Centre Urbanisation Culture Société, Montreal, Canada; [c]Department of Geography, University of Salamanca, Salamanca, Spain

ABSTRACT

An analysis of the motivations of university students from Temuco (Chile) and Montréal (Canada) to change residence during the COVID-19 pandemic is presented based on data from a simultaneous survey in the two cities carried out in 2021. Quantitative analysis based on Principal Component Analysis showed a bifurcation between both cases despite the similarities they presented. Contrary to expectations that moves are first and foremost about the redundancy of student accommodation during the temporary transition to online learning or the need for more amenable study space in the home, the results highlight the primacy of psychological motivations, although economic, material and to a lesser extent family-related reasons for moving remain important. The context of each case study also allows for establishing differences between motivations more closely linked to material aspects and psychological and physical well-being in Montréal, and family-related motivations and psychological well-being in Temuco. Exploring this tension between individual motivations and urban contexts opens a promising way forward for new comparative studies in student housing and studentification research.

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University students; residential mobility; COVID-19; motivations; Montréal; Temuco

Introduction

The emergence of the worldwide COVID-19 pandemic led to sudden, dramatic changes across all spheres of society, and housing is no exception. For some, lockdowns and work from home lent greater importance to both the physical, material space of housing as well as the subjective experience of home, as one's residence came to contain nearly the entirety of one's existence (Parsell & Pawson, 2023). Existing inequalities in housing meant that whether one's home was able to meet these new needs was highly uneven – for example, due to crowding, inadequate space, or poor state of repair. For others, loss of income threatened their ability to stay housed (Benfer *et al.*, 2021).

CONTACT José Prada-Trigo jose.prada@uva.es Department of Geography, University of Valladolid, Valladolid, Spain

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University students faced a particular set of housing challenges with the onset of the pandemic. Students often leave the parental home temporarily to live near their university for the duration of their studies and may return to the parental home periodically or after completing their degree (Rugg *et al.*, 2004), yet the need to live proximate to school may have been eliminated with the transition to online teaching. Students often live in shared accommodation, which could present issues with crowding or adequate space and internet bandwidth to do online schoolwork. Finally, while some students come from well-to-do backgrounds and benefit from substantial parental support, many have little or no income while studying, and students' pre-pandemic housing precarity is well-documented (Fang & van Liempt, 2021; Sotomayor *et al.*, 2022). For all these reasons, students may be particularly susceptible to have moved due to the pandemic, whether by returning to the parental home or finding another apartment in their city of study (Prada-Trigo *et al.*, 2021; Źróbek-Różańska, 2022).

However, little is known about the relative importance of various possible reasons for students to change residence because of the pandemic, nor how these may differ between contexts. This is the research question that motivated our study. We address this question through parallel online surveys administered to students who moved during the pandemic in Temuco and Montréal, important 'university cities' in southern Chile and the province of Québec (Canada), respectively. To our knowledge, this is the first study to consider students' housing experiences during the pandemic through an international comparative approach. The contributions of this research are several. First, we find that mental and physical well-being are important motivations to move in both cities, surpassing financial and material concerns, although these also remain important. Second, despite broad similarities, further analysis reveals that the distribution of responses differs within each city. For instance, the security provided by family was considerably more important to movers in Temuco than Montréal. Finally, and following from the previous point, these differences point to the need for more comparative work pertaining to the urban geography of students in the context of COVID-19 and beyond, for example as differences in residential mobility may shape the variegated geographies of studentification. While our study concerns the specific period of the COVID-19 pandemic university closures, it is salient in the post-pandemic context as many housing, economic, and psychological difficulties faced by students were exacerbated during this time, but continue to the present (Alamel, 2021; Sotomayor *et al.*, 2022).

In the following section, we begin by sketching an overview of existing research on student accommodation during the COVID-19 pandemic. Subsequently, we introduce our comparative approach, and the Temuco and Montréal cases, before describing the methods used. Next, we present the findings from each city and in comparative perspective. In the final section, we provide a synthesis of the results and their implications for understanding the geographies of student housing and for housing policy.

COVID-19 and student accommodation

For higher education institutions around the world, the spread of the coronavirus meant the physical closure of universities and the transition to fully or partially online instruction (Gelles *et al.*, 2020; Mertens *et al.*, 2020; Aucejo *et al.*, 2020).

This closure of campuses had several impacts, including restricting access to green spaces for some in the community (Sun *et al.*, 2021), diminishing interactions between universities and surrounding communities (Iranmanesh & Mousavi, 2022), and exacerbating previous socio-spatial inequalities (Sun *et al.*, 2021).

For students, the pandemic has presented particular challenges, related to the availability of educational resources and an adequate Internet connection to follow classes online, suitable spaces for learning, and reduced income due to loss of employment (Gelles *et al.*, 2020), which could impact students' purchasing power and ability to secure sufficient housing. In this regard, one dimension of student life called into question by the pandemic is private indoor space. Lockdowns and restrictions on mobility have revealed the deficiencies of many students' accommodations when confined to the home for several months (Ayala *et al.*, 2022). In this sense, students are among those most impacted by these intense changes, often residing in small, poorly equipped houses or apartments with little common space, and which were not amenable to the new space needs imposed by the pandemic – studying, socializing, and exercising at home (Valizadeh & Iranmanesh, 2022). Thus, they are also a group whose mental health has been among the most affected by lockdowns (Haesebaert et al., 2020).

Another important problem students have faced is paying for accommodation. Already an issue prior to the pandemic (Fang & van Liempt, 2021; Kenna & Murphy, 2021; Miessner, 2021; Sotomayor *et al.*, 2022), the high cost of housing has often been seen as superfluous and was abandoned in favour of a return to the family home following the suspension of in-person teaching. Existing research suggests that lease agreements or contracts may have played a surprisingly small role in students' residential mobility. While some students may have had legal obligations to continue paying rent for an apartment they no longer lived in, others may have voluntarily chosen to pay, either to reserve the space for the eventual return of in-person classes (perhaps with some optimism that this would be soon) or to store belongings (Prada-Trigo *et al.*, 2022). Źróbek-Różańska (2022) finds that students in Poland demonstrated remarkable savvy in negotiating early terminations of the rental contract with landlords during the pandemic, demonstrating little desire to pay to keep the accommodation during the pandemic period and scarce attachment to the space, reaffirming the notion of student housing as temporary. For those who decided to keep their accommodations during the pandemic, the primary reasons were poor conditions for online study in the family home, and the existence of social relationships and employment in the university city. However, motivations for leaving one's accommodation are not explored, leaving a gap that this research aims to fill. Meanwhile, in the UK, many student housing landlords offered rent rebates and early lease terminations to maintain a positive public perception and attract future tenants (Revington & Benhocine, 2023). In short, the role of rental contracts in residential mobility was often mitigated during the pandemic.

Zasina & Nowakowska (2022) examine the changes to students' habits of consumption and socialization during the pandemic in the city of Lodz, Poland, working from the premise that before the pandemic, the increasing number of students and the reorientation of cities towards a consumption-based economy would lead to a dependence on both, resulting in an especially profound impact of lockdowns and online teaching. Indeed, Zasina & Nowakowska (2022) identify a withdrawal of social relationships and an abandonment of urban areas by students, as in other work, but without demonstrating any interest in the motivations for students' change of residence. Bánhidi & Lacza (2020) conducted a study on changes in students' habits during the pandemic but focused more on their daily routines and changes in habits than on their residential mobility. Similar work is carried out by Iranmanesh & Mousavi (2022) in Cyprus, using georeferenced Tweets to analyze changes in activities and in the relationship of students from three universities with their respective urban areas, finding fewer interactions with the city at large. However, these works do not discriminate between those who kept their residence and those who moved due to COVID-19, so the motivations of both are unknown.

Finally, the works of Malet Calvo et al. (2021) and Morris *et al.* (2021) focus on international students. The first, from a post-colonial perspective, emphasizes the challenges that international students have faced during the pandemic, some similar to those observed in other studies (e.g. isolation, reduced social contact) and some related to their conditions as non-residents (e.g. lack of family support, financial difficulties, dependence on university infrastructure). The second, for its part, analyzes the challenges of international students regarding housing before and during the COVID-19 pandemic through the concept of risk. There is therefore evidence that COVID-19 has reinforced the housing precarity of students that existed prior to the pandemic due to a lack of adequate and affordable housing, requiring students to develop 'creative' tactics to access it (Sotomayor *et al.*, 2022).

In short, despite being a topic of interest with roots prior to and following the pandemic (due to the housing issues facing students), there is no work that has questioned the motivations of university students to return to the family home or move elsewhere due to the pandemic – and their relative importance – let alone develop a typology of these reasons or an international comparison to explore similarities or differences between contexts. This topic can be linked to work on studentification, which considers the phenomenon by which students become concentrated in certain urban neighbourhoods and related issues (Smith, 2005), or de-studentification, whereby students vacate a neighbourhood (Kinton *et al.*, 2016). Notably, some work has already examined de-studentification precipitated by the pandemic (Prada-Trigo *et al.*, 2022). While (de)studentification has been theorized as a product of institutional and political factors such as enrolment dynamics or housing policy (Nakazawa, 2017) and structural dynamics of housing markets (Revington & August, 2020), it is also shaped by students' own preferences for certain types of accommodation across a 'production-consumption interface' (Kinton *et al.*, 2018, p. 242). Therefore, an exploration of students' reasons for residential mobility in the pandemic context may go some way to explaining geographies of de-studentification. In a broader post-pandemic sense, understanding students' residential mobility can deepen explanations of the geographies of studentification beyond purely institutional, political, or economic factors as well as the links between this process of urban change and individual housing pathways (Revington, 2018).

Most works that have analyzed student issues during the pandemic have been based on online surveys, with samples that vary between 163 and 507 responses (Zasina & Nowakowska, 2022; Źróbek-Różańska, 2022; Bánhidi & Lacza, 2020).

In case studies linked to student subgroups, such as the work of Malet Calvo et al. (2021), eminently qualitative methodologies have been developed, particularly in-depth interviews. Only the work of Morris *et al.* (2021) carries out a mixed methodology, based on 751 surveys of international students accompanied by 40 in-depth interviews. In general, these studies represent new research projects launched as a result of the pandemic, but in some cases (Zasina & Nowakowska, 2022; Morris *et al.*, 2021), pre-pandemic research was used to repeat the same questions and compare changes brought about by the spread of COVID-19. Our work draws on a primarily quantitative methodology, through on-line surveys carried out in parallel in Chile and Canada, with the added challenge of obtaining comparable information between the urban areas of Temuco (Chile) and Montréal (Canada). The possibility of comparing the same phenomenon in two very different realities allows us to draw parallels and establish differences between the two cases.

Comparative approach

While there exists a robust comparative literature in urban studies (e.g. Cochrane, 2020; Nijman, 2007; McFarlane, 2010; Ren, 2022; Robinson, 2011, 2016), these currents have scarcely infiltrated work on student housing. While there have been some quantitative *intra*-national comparisons of studentification between Canadian (Moos *et al.*, 2019; Revington *et al.*, 2023) and US (Foote, 2017) cities, and some have reflected on differences in studentification between regions of the globe (Nakazawa, 2017), few empirical studies have attempted explicit international comparisons. Gu & Smith (2020) offer a notable exception, providing an analysis of studentification in a Beijing case study in relation to the British literature. Zasina *et al.* (2023) also compare students' activity spaces (not only their residential locations) in Lodz (Poland) and Turin (Italy). Yet, advancing further comparative work regarding student housing is critical given the increasingly 'global' nature of studentification research (Gu & Smith, 2020) and some apparent similarities in the housing challenges facing students in different contexts (e.g. Fang & van Liempt, 2021; Sotomayor *et al.*, 2022).

Debates on comparative urbanism have highlighted both a range of strategies of comparison and the assumptions underlying these approaches (for a summary, see Robinson, 2011). Studies may seek, for instance, to identify general (or universal) tendencies across two or more urban contexts (often using quantitative methods); to understand the role of cities as differentiated instances of a common, systematic process; or to develop explanations for variations among otherwise similar cases. Even single-case studies contain implicit comparison as the analysis is inevitably filtered – by the researcher and the reader – through the lens of existing literature about other places, or experiences elsewhere (McFarlane, 2010). However, another approach – and the one we mobilize in this study – constructs a comparison between 'most different' cases in the search for similar outcomes, which may be the result of either a common cause, or of entirely different causalities (Pickvance, 1986; see also Robinson, 2011).

A comparison based on the very different cases of Temuco and Montréal responds to calls to 'begin processes of conceptualization anywhere' (Robinson, 2016, p. 19).

It is not merely a question of adding empirical variety (although this may be valuable), but also a political affirmation that knowledge and theory can be produced on the basis of cities anywhere (Ren, 2022). This approach allows us to eschew unfounded assumptions that purportedly more 'similar' cases – say, two large Canadian cities or two smaller Chilean ones, or each country's largest metropolis (Toronto and Santiago) – can provide greater insight, or conversely, that those that are more different are somehow incommensurable (Robinson, 2011). It also enables theory-building 'from below' (Cochrane, 2020): while pre-existing concepts (such as studentification) exist and hold some relevance, they are less helpful in understanding students' individual motivations to move during the COVID-19 pandemic. Existing literature has either addressed the possible causes of students' residential mobility during the pandemic indirectly (since residential mobility is not the focus of the research, as such), or considers a more limited range of factors without placing these in relation to each other; there is, in other words, little to go on in terms of a priori conceptual frameworks or obvious comparators.

Our case selection is not driven by existing theory or according to predefined variables, which can be a weakness of comparisons that presume cases are two differentiated units of a single system (Robinson, 2011), for instance in reproducing (often essentializing) categories such as the 'Global North/South' (McFarlane, 2010). Instead, our case selection is a result of practical realities and a serendipitous opportunity to collect comparable data in both Temuco and Montréal. The objective of this comparison is to consider how a single event (the COVID-19 pandemic) is articulated through students' residential mobility in different contexts. The aim is not to universalize, but to identify similarities and differences that may or may not be defined by contextual differences. In this way, our analysis is something of a starting point for future comparative work to examine more rigorously the hypothesized causal links.

Temuco is a city located in the Araucanía region of Chile, 680 kilometres south of the capital, Santiago de Chile. It has a population of 282,415, while the wider urban area exceeds 360,000 inhabitants (*Instituto Nacional de Estadística*, INE, 2019). Temuco is the capital of Araucanía, and the most important city in southern Chile, exercising a strong centralizing effect on its surroundings and providing services for the rest of the region. This situation derives from its history as a city founded in 1881 with a strong military character to uphold the sovereignty of the Chilean state, in a process of settler colonialism that has marked its urban evolution up to the present (Prada-Trigo et al., 2021). Nowadays, Temuco is one of the most attractive places to study within Chile, being the city with the fourth-largest number of students after Santiago, Concepción and Valparaíso. The largest educational institutions are the Universidad Católica de Temuco (with 10,916 students enrolled in 2020), the Universidad de La Frontera (10,164), the Universidad Autónoma (6,563), the Universidad Mayor (3,452), and the Universidad Santo Tomás (1,457), according to the Consejo Nacional de Educación (CNED, 2021). Nevertheless, only La Frontera and Católica have a campus proper, the former in the centre of the city and the latter in the periphery. The other universities consist of isolated buildings dispersed across the urban area.

Temuco gained its 'university city' identity following 2009, when it experienced a significant year-over-year increase in enrolment (from 21,404 to 25,946).

Since then, this figure has continued to increase, presently exceeding 33,000 university students, in addition to another 20,000 students in professional technical institutes. Furthermore, this university boom led to the formation, in 2015, of an alliance between the city's six largest universities, the municipality, and the private sector, known as 'Temuco Univerciudad,' a platform that seeks to position Temuco nationally and internationally as a university city and promote a better perception of its academic and cultural offerings. In this way, the arrival of students has been combined with a public-private initiative to bolster the 'university' character of the city. As in other Chilean cities, these students mostly live in apartments and rooms rented to individuals, and neither purpose-built student accommodations (PBSA) nor university-provided residences are common (Prada, 2019).

In Chile, COVID-19 was declared a national epidemic at the beginning of March 2020, decreeing sanitary measures for primary, secondary and higher education, first through the temporary suspension of classes, and after March 25, the suspension of in-person attendance, thus introducing online education at all levels. Online instruction was maintained for longer at the university level than others, through the 2020-21 and 2021-22 academic years. Although some universities timidly implemented hybrid and limited-contact teaching models in the second semester of the 2021-22 academic year, up to March 2022, face-to-face teaching had not widely resumed in higher education. Consequently, the majority of university students returned to the parental home during the pandemic (Mac-Ginty *et al.*, 2021), generating important changes in the socio-economic dynamics of university cities.

Montréal, meanwhile, is the second-largest metropolitan area in Canada, with a population of approximately 4.2 million, and is the cultural and economic centre of the province of Québec. The region is home to approximately 200,000 students across several universities, the largest of which are Concordia University, McGill University, Université de Montréal, and Université du Québec à Montréal, and regularly performs highly on rankings of the 'Best Student Cities' in North America (e.g. Quacquarelli Symonds, 2022). In this regard, Montréal is a North American college town more in the model of Boston, Massachusetts than of Ann Arbor, Michigan or Ithaca, New York. International enrolment has grown substantially at Québec universities, in recent years offsetting stagnating domestic enrolment due to demographic factors, with the vast majority concentrated at Montréal-based institutions (Statistics Canada, 2022; Ministère de l'Immigration, de la Francisation et de l'Intégration, 2020). This internationalization has been driven largely by federal, provincial, and regional government initiatives to attract international students to generate revenue for universities due to the higher tuition they pay, and to provide skilled labour for the knowledge economy (Trilokekar & Kizilbash, 2013).

The four largest universities each have a portfolio of institutional student residences, although combined they account for fewer than 6,000 bedrooms. While Montréal is home to the third-largest concentration of private purpose-built student accommodation (PBSA) in Canada (Revington & August, 2020), this also accounts for a small portion of the overall housing market. As such, since it is common to leave the parental home to study, the majority of students live in the traditional private rental market, where it is estimated that they pay, on average, higher rents for poorer quality housing than non-student residents (UTILE, 2022) and face exploitative conditions (Gherbi-Rahal, 2021), a situation common to students in other Canadian cities (Revington, 2021; Sotomayor *et al.*, 2022). At the same time, the sizeable student population is also a factor in the displacement of other marginalized renters from inner-city neighbourhoods through the studentification process (Jolivet *et al.*, 2022).

On March 13, 2020, with at least 17 confirmed cases of COVID-19 in the province, the Québec government announced the temporary closure of all universities and colleges (Perreaux, 2020), and soon after, the closure of non-essential businesses and restrictions on gatherings in private homes. Many universities subsequently closed their residences, where shared spaces made adherence to public health guidelines such as distancing impractical, forcing students to leave on short notice. While universities promised accommodations for students unable to return home due to exceptional circumstances, student unions described these sudden closures as an 'irresponsible' move that would 'create more risk to a vulnerable population' (Lapierre, 2020). While university closures were initially intended to last only until March 30, 2020, most university programs in the province did not fully return to in-person instruction until September 2021.

In the meantime, several residences reopened at lower capacity and with stricter public health restrictions in place. Reopening was not without problems, however. At McGill University, for instance, 44 students in residence were infected in a COVID-19 outbreak in January, 2021 and at least 15 were evicted for breaching safety protocols (CBC News, 2021; Ross, 2021). Students living off-campus also reported challenges involving isolation and the closure of common facilities in their apartment buildings (Steuter-Martin, 2021).

Despite differences, particularly in the size of each city, both cases present similarities worth noting. Neither is the capital or most populated city of its respective country, although they are among the most dynamic and are important regional centres. Both have a growing university population, but are not the largest in the country, and both have an identity as a university city, with Montréal being more established and Temuco more recent. Finally, both cities have an identity distinct from the majority of their respective countries: while Montréal is part of the Francophone tradition of Québec, Temuco is the capital of the region with the highest percentage of Indigenous population in Chile, characterized by a tense relationship with the Chilean state (Prada-Trigo *et al.*, 2021).

Methods

Our data are drawn from two parallel on-line surveys carried out in Chile and Canada, respectively, allowing us to compare and contrast students' housing experiences during the pandemic in these two very different contexts. In both surveys, respondents who had moved because of the pandemic were asked to rank the importance of ten distinct reasons for doing so on a five-point Likert scale, where 1 represents 'not important' and 5 is 'very important'. The ten reasons asked about were: 1) financial difficulties; 2) the security provided by family life; 3) to receive care from a family member; 4) to provide care for a family member; 5) out of obligation to the family; 6) to save money despite a lack of financial difficulties; 7) physical wellness; 8) psychological well-being; 9) need for a better Internet connection; and 10) need for more space. The survey was conducted in Spanish in the Chilean case, and in both English and French in the Canadian case.

The surveys in Chile were conducted between December 2020 and February 2021, returning 729 valid surveys. Due to the pandemic, surveys were distributed online to students at the three largest universities in Temuco through direct contact with their academic authorities. The surveys in Canada took place between January and April 2021, during which time nearly all university programs in Québec were delivered remotely. In the Canadian case, the survey questions we analyze in this paper were part of a broader country-wide study of students' housing conditions, carried out by the non-profit organization UTILE (2022). To provide a city-to-city comparison, we only consider the 695 responses from the Montréal region. Our study only considers respondents who moved, as the focus of this research is on the different motivations for changing housing during the pandemic and the unequal weight of these in each city. This implied excluding other students who had not changed their residence for various reasons (international students who could not return to their home countries, daily commuters, students who could not cancel their lease, etc.) in order to delve deeper into the reasons that motivated the change of residence during the pandemic.

The validity of the questionnaire was determined in two stages. First, prior to sending, the content validity as a consistency parameter was analyzed (Drost, 2011). To do this, a panel of experts from the department in which the first author worked at the time reviewed the questionnaire to confirm that the questions were representative of the theoretical framework and research objectives that the study sought to evaluate. Secondly, once the results were collected, a test of reliability was carried out using Cronbach's Alpha for the Likert-type questions. This yielded a coefficient of 0.839 for Montréal and 0.740 for Temuco, which implies strong internal consistency of the data in both cases, allowing for the continuation of the results analysis.

Firstly, the averages of each case were analyzed, applying Mann-Whitney and Student's tests to assess the similarity or dissimilarity between the results of Temuco and Montréal. Subsequently, since the purpose of this work is to establish a comparison in the selected study areas, it has been necessary to implement another statistical technique for relating what happened in Montréal and Temuco in terms of student mobility. A multivariate technique, Principal Component Analysis (PCA), has been selected, which groups the information to facilitate its interpretation. The main objective is to classify all the observations based on the establishment of homogeneous groups or components (Guisande *et al.*, 2011). The statistical development has been carried out with SPSS software.

In the case of PCA, this methodological process implies, first, avoiding the presence of highly correlated variables, which cause a saturation of the model. For this, three correlation matrices have been made: one for Montréal, another for Temuco and a third that brings together the information from both cities. The only values in the three tables that showed a significant correlation were, in the case of Montréal, the need for family care and the need to care for a relative (Pearson coefficient around 0.7). The rest of the variables do not show significant correlations, so the data allow applying the PCA.

Comparing students' motivations for moving

Students' average ratings of each of the ten reasons for moving are presented in Table 1 for both Temuco and Montréal, ordered by their rank in the Temuco case. The importance assigned to the various criteria is remarkably similar in both cases. Psychological wellbeing is the most important reason for moving, and physical wellness also ranks highly. Financial considerations are of moderate importance in students' pandemic-related moves, while receiving care from or providing care to family, or other obligations to the family, are the least important reasons in each city.

To determine the significance of the differences between students' responses in Temuco and Montréal, two tests were applied. First, to analyze the distribution (normal or non-normal) of the responses to the ten questions, the Kolmogorov-Smirnov test was used, to test the hypothesis of normal distribution in the responses pertaining to each reason for leaving one's housing during the pandemic. Six of the ten results were significant at the 0.05 level, suggesting a non-normal distribution (Table 2). On the contrary, the distribution was approximately normal ($p < 0.05$) in the case of four results (psychological well-being, physical wellness, the need for more space, and obligation to the family).

Second, the similarity or dissimilarity of results between Temuco and Montréal was considered. For questions with normal distributions, Student's T test was used, while for questions with non-normal distributions, an alternative, the Mann-Whitney test, was used. Differences were significant ($p < 0.01$) for the six responses to which the Mann-Whitney test was applied, meaning that results in Temuco and Montréal are independent for these questions, as they are not equivalent. On the contrary, in three of the four questions to which the Student's T test was applied, differences were not significant ($p > 0.05$); in other words, answers were similar between the two cities. The factors with similar responses in both cases are those referring to the obligation to return to the family home, the importance of psychological well-being, and the need for more space. In this sense, a similar weight of these three elements (mental health, space to study, and family obligation) can be intuited in both cities. Indeed, mental health was the most important reason to move in both cities, while family obligation was the least. Nonetheless, the fact that seven of the ten questions yielded non-comparable answers raises the need to independently interpret the two case studies.

Table 1. Average Likert score for each reason to move, by city.

	Temuco		Montreal	
	Average score	Rank	Average score	Rank
Psychological well-being	4.25	1	4.36	1
Security provided by family	4.19	2	2.87	5
Physical wellness	3.91	3	3.78	2
Financial difficulties	3.83	4	3.25	4
To save money	3.68	5	2.86	6
Need for better Internet connection	3.67	6	2.80	7
Need for more space	3.62	7	3.67	3
To provide care for family	2.92	8	2.25	8
To receive care from family	2.66	9	2.09	9
Out of obligation to the family	2.04	10	2.08	10

Table 2. Results of the Kolmogorov-Smirnov test for the reasons for changing residence during the pandemic.

More extreme differences	Financial difficulties	Security provided by family	Receive care	Provide care	Out of obligation to the family	Save money	Physical well-being	Psychological well-being_	Need better internet	Need more space
Absolute Positive Negative	.198	.343	.291	.253	.044	.259	.067	.065	.270	.059
	.000	.000	.000	.000	.044	.000	.000	.065	.000	.059
	−.198	−.343	−.291	−.253	−.033	−.259	−.067	−.004	−.270	−.028
Kolmogorov-Smirnov test	3.644	6.143	5.210	4.517	.782	4.678	1.235	1.194	4.924	1.091
Bilateral asymptotic significance	.000	.000	.000	.000	.574	.000	.095	.116	.000	.185

The largest difference between the two cases is with respect to the scores assigned for the sense of security provided by family as a reason to move during the pandemic. Here, the average score in Temuco is 4.19 (1.32 points or 46% higher than in Montréal). This sense of security was the second-most important reason to move in Temuco, but only the fifth-most important reason in Montréal. The difference is likely attributable to the differing composition of the student population in each case, with a higher share of students in Temuco native to the city or region, and thus easily able to move in with family to achieve a sense of security with the onset of the pandemic. Meanwhile, in Montréal, the larger share of students from outside of the region – and especially, from abroad – may have been less able to do so due to both the vast distances involved and pandemic-related travel restrictions, and therefore, living with family was a less important consideration in these students' residential mobility.

Despite similar rankings, the average score given by students for the need for a better Internet connection was 31% higher in Temuco than in Montréal, perhaps because high-quality Internet is widely available – ubiquitous, even – in the latter case. Saving money was also accorded greater importance in Temuco (with an average score 29% higher) than in Montréal. This might reflect the overall economic disparity between Chile and Canada, as financial need was also rated higher in importance in Temuco, although the difference between the cities is smaller on this dimension. Physical wellbeing ranked highly in both cities, second in Montréal and third in Temuco, although average scores were slightly higher in Temuco. While providing care to or receiving care from family were among the least important reasons to move due to the pandemic in both cases, average scores were slightly higher in Temuco. Again, this is likely due to the more local orientation of its student population. The largest difference in rank between the two cities is with respect to the need for space, which was rated as the third-most important reason to move in Montréal, but seventh in Temuco. However, absolute average scores are of negligible and non-significant difference.

The results of the PCA make it possible to determine four components in both cases (Tables 3 and 4), which explain 75% of the responses in Montréal and 65% in Temuco. To verify this, separate scree plots were made and interpreted, confirming this result. Although three of the four components are the same for the two cities, the one that refers to aspects related to the family is different, since in Temuco it brings together three variables (the need to receive family care, the need to care for a relative, or obligation to the family) and in Montréal, the variable concerning the security provided by family is added. The other three components are exactly the same in both cases: there is a component linked to well-being, including physical and psychological aspects, another that can be related to economic issues (saving money, and economic difficulty as a result of the pandemic), and a final component linked to more material aspects, such as an improved internet connection or the need for more space.

However, despite this similarity in the components, the weight of each one is different between the cities. As shown in Table 5, in Montréal, the component that brings together the variables related to the family explains the largest share of the variance (42%), unlike in Temuco, where it accounts for only 11.4% of the total variance.

Table 3. Correlations between principal components and reasons for moving in Temuco.

	Component			
Temuco	1	2	3	4
Financial difficulties	−.136	.017	.068	.433
Security provided by family	.206	−.057	.003	−.024
To receive care from family	.305	−.074	.367	−.178
To provide care for family	.143	−.185	.498	.248
Out of obligation to the family	−.323	.136	.526	−.139
To save money	.000	−.115	−.200	.721
Physical wellness	.433	−.021	−.094	−.065
Psychological well-being	.366	−.038	−.111	−.029
Need for better Internet connection	−.053	.578	−.033	.096
Need for more space	−.105	.635	.005	−.167

Table 4. Correlations between principal components and reasons for moving in Montréal.

	Component			
Montreal	1	2	3	4
Financial difficulties	.312	−.101	.632	.424
Security provided by family	.709	.203	.369	−.124
To receive care from family	.853	.157	.189	.180
To provide care for family	.869	.108	.166	.205
Out of obligation to the family	.806	.029	.059	.156
To save money	.196	.177	.872	.006
Physical wellness	.205	.811	.223	.124
Psychological well-being	.114	.865	−.027	.102
Need for better Internet connection	.278	.180	.139	.800
Need for more space	−.020	.574	−.002	.597

Table 5. Variance explained by components grouping selected variables.

	Montréal	Temuco
Family	42.0	11.4
Well-being	16.4	29.0
Financial	8.9	9.8
Material	8.2	15.0

This component, in Montréal, also contrasts markedly with the remainder of the components: well-being (16.4% of variance), financial (8.9%) and material (8.2%). In Temuco, meanwhile, the weight of the components is more equal, and contrary to Montréal, the most important is well-being (29%) followed by material (15%), family (11.4%) and financial (9.8%) components.

From this comparative perspective, it appears that issues related to physical and psychological well-being are important in both cases, but especially in Temuco, where they occupy the first place. As some authors have pointed out, the pandemic has unleashed an increase in physical and mental concerns linked to confinement (Kyne & Thompson, 2020; Gelles *et al.*, 2020), and students have been no exception. Recall that these criteria were the ones that received the highest average scores in both cases. In relation to financial conditions (worsening due to the pandemic, and the desire to save money), these are more important to explain the responses in

Temuco than in Montréal, which can indicate the existence of more segmented social groups in the Chilean city, with a higher heterogeneity.

In the case of responses related to family, there are several differences between Montréal and Temuco. In the first case, although these components explain 42% of the responses, they do so with very low scores: the percentage of students who gave 1 or 2 points on the Likert scale to receive care (67.7%), provide care (62.4%) or out of obligation to the family (66.8%) was very high. This percentage fell only slightly regarding the security provided by family (44.1%). On the contrary, in Temuco, despite the fact that these questions explain only 11.4% of the variation, their average score was higher than in Montréal, especially with respect to the security provided by family, for which 57.6% of the respondents selected the option 5, 'very important.' In contrast, the percentage of students who responded with 1 or 2 to these options was generally lower than in Montréal: 50.3% for receiving care, 42.9% for providing care, and only 10.6% for the security provided by family. This comparison shows that, although the family obligation to return was not prominent in either of the two cases, the security provided by this institution is greater in Temuco than in Montréal.

Finally, in Temuco, the responses related to material issues (internet connection and space availability) have a capacity to explain almost double the responses compared to Montréal, which would coincide with a greater weight given to the internet connection in Temuco (3.67) compared to Montréal (2.80). The greater importance of these aspects in Chile can be linked to recent work that has revealed the coexistence of many students in the same house (Prada, 2019), generating uncomfortable circumstances for the shared use of the Internet or the availability of privacy.

Discussion and conclusion

There is no doubt that the worldwide COVID-19 pandemic that began in March 2020 has brought new challenges to student geographies. University students had to adapt to new modalities of online teaching and new forms of socialization. Housing has played a fundamental role in these changes, whether students decided to stay in their temporary home, return to the family home, or move elsewhere. Although our findings in Temuco and Montréal coincide with Źróbek-Różańska (2022) in the sense that living and study space are very important in explaining the motivations of students to maintain their accommodation or not during the pandemic, this work has shown that other elements such as physical and psychological well-being are of greater importance, while financial issues and family ties also have a role to play. In both cases, the aspects that proved most important in students' decisions to move during the pandemic were the physical and psychological well-being of students, followed by economic motivations. These findings suggest that – contrary to what might be expected – de-studentification during the pandemic was driven less by the redundancy of student accommodation during online teaching or material conditions of the accommodation *as such*, at least in Temuco and Montréal. The family has remained in the background, especially in Montréal, although in Temuco, its role has been valued in terms of the security it provides, thus being linked to well-being. This result is similar to the findings of

Haesebaert et al. (2020), who also identify the importance of psychological well-being and student social networks. However, the results of our work go one step further, highlighting the importance of having a suitable workspace and a good internet connection.

Although both cases present important similarities, there are also significant differences. Among the former, the similarity in the distribution of responses referring to space, psychological well-being, and obligations to the family stands out. So too does the fact that in both cities, four principal components were identified, structured around similar criteria: family, well-being, financial concerns, and material conditions, respectively. Among the latter, in Montréal there is a broad coincidence in the responses referring to the family, although the low average scores indicate that for most students, family reasons are less important in justifying their abandonment of their pre-pandemic residences. In Temuco, on the contrary, students' reasons for moving tended to be more balanced between the different dimensions, although well-being stands out as an element with a greater consensus among those surveyed, as do material conditions (space and internet connection); however, these latter elements were less important overall in justifying students moves.

Our comparative approach holds lessons for other studies of student geographies during the pandemic and beyond. Indeed, despite finding broadly similar reasons for moving between Montréal and Temuco, the differences identified suggest caution in transferring findings from one locale to another. This is a particularly important consideration given that the much of the existing research on studentification and students' housing experiences before, during, and since the pandemic has been undertaken within the context of a single city or country. While we did not find significant differences between survey responses in Temuco and Montréal for three criteria (mental wellbeing, the top factor in both cities; the need for more space; and family obligations, the least important factor in both cities), differences were statistically significant for the seven remaining criteria, all with higher scores in the Temuco case. Many of these discrepancies would seem to be explained by contextual differences between Temuco and Montréal. For instance, in Montréal, the reduced importance accorded to the security provided by family, and to a lesser extent providing care to or receiving care from family, may relate to the city's cosmopolitanism and its more prominent role in international student migration relative to Temuco. The pandemic may have prompted international students in Montréal to move, but complicated and rapidly changing restrictions on international travel may have precluded them from returning to the parental home in another country. Likewise, the greater importance ascribed to financial criteria in Temuco likely reflects the general economic disparity between Chile and Canada.

Insofar as (de)studentification is partially driven by students' housing preferences and residential mobility, and that these appear to differ between contexts, these differences may contribute to explaining variegated geographies of (de)studentification. While further work is necessary to develop this hypothesis and uncover the causal drivers of the differences we observe, comparative research might productively consider students' residential mobility alongside complementary institutional, political, and economic explanations of studentification (Kinton *et al.*, 2018; Nakazawa, 2017; Revington & August, 2020). Such a project would link individual motivations with larger processes of urban change (Revington, 2018). A limitation of the present work is that it only considers the motivations of movers, so it is impossible to know if non-movers shared similar concerns but were prevented from moving for some reason, or if they did not move because they had no concerns with their living situation; future work could garner important insights by simultaneously considering the experiences of non-movers.

The overriding importance of mental and physical health followed by financial considerations and the material conditions of living space imply that the pandemic worsened pre-existing issues with housing conditions and affordability facing students in Canada (Gherbi-Rahal, 2021; Sotomayor *et al.*, 2022) and Chile – challenges that also faced students in other national contexts prior to the pandemic (Fang & van Liempt, 2021; Kenna & Murphy, 2021; Miessner, 2021). This result also highlights an important association between students' housing and their mental health. These issues, although exacerbated by the COVID-19 pandemic, continue to be present today, guiding research like this towards identifying the most critical points for intervention. For example, it points to a need for universities to provide greater mental support for students, with housing as a crucial point of intervention. However, in both Temuco and Montréal, the current tendency is for universities to leave student housing to the private market. Governments may have an important role to play in supporting universities to provide housing for their students. After all, all levels of government in Montréal have pushed for increased international enrolment without any provisions for housing the students they have sought to attract. Meanwhile, the Temuco Univerciudad initiative has also sought to boost the region's appeal as a student city despite the absence of a dedicated housing supply for students. If universities and governments were to take responsibility for the housing issues facing the students they actively recruit, a properly funded supply of institutional accommodation could provide student support services (including mental health services) *in situ*, while also isolating students from the high rents and poor housing quality that often plague the private rental market (Gherbi-Rahal, 2021; Miessner, 2021; Revington, 2021; Sotomayor *et al.*, 2022). While many students may have still returned to the parental home for other reasons, such accommodation may have mitigated the pandemic's impact on students' residential mobility given the importance accorded to psychological wellbeing, and it would undoubtedly be of value in the post-pandemic period as mental health and housing issues continue to affect students.

Taken together, the diverse strategies and motivations for changing residence by students have shown different intensities along the four main components analyzed. Although Montréal and Temuco present different socioeconomic and urban contexts, which help explain some of the differences, both cases show that psychological and physical well-being have been a fundamental variable in explaining student mobility during the pandemic. Exploring this tension between individual motivations and urban contexts opens a promising way forward for new comparative studies in student housing and studentification research.

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Notes on contributors

José Prada-Trigo is an Associate Professor of Urban Geography in the Department of Geography at the Universidad de Valladolid (Spain). His research interests include the geographies of students and the urban impacts of universities, the vulnerability and segregation process and the social dynamics connected to urban development. His most recent work examines the Real estate dynamics and changes in the urban morphology in a Chilean case study.

Nick Revington is an assistant professor of urban studies in the Centre Urbanisation Culture Société at the Institut national de la recherche scientifique in Montréal, Canada. His research interests include the political economy of housing markets and urban development, the residential geographies of students and young adults, and the urban impacts of universities. His most recent work examines the emergence of the private purpose-built student accommodation sector in Canada.

Irene Sánchez-Ondoño is an Assistant Professor in the Department of Geography at the University of Valladolid (Spain). Her research topics deal with urban transformations in intermediate cities. She is part of the Recognized Research Group “City and Spatial Planning” at the University of Valladolid.

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