Research article

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Creating Meaningful Experiences of Sufficiency

A longitudinal field study to examine student housing settings to enhance the meaning of shared living and sufficiency

Sinnstiftende Erfahrungen von Suffizienz schaffen

Eine längsschnittliche Feldstudie zur Untersuchung von Studierendenwohnheimen als Settings zur Steigerung des Sinnerlebens von gemeinschaftlichen Wohnen und Suffizienz

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TH: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Software, Visualization, Writing – original draft. MH: Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – review & editing. This research was supported by a grant from the Federal Ministry of Education and Research (grant no. 01UR2201B) awarded to MH. Conflicts of interests: none.

Hüppauff, T. & Hunecke, M. (2025), Creating Meaningful Experiences of Sufficiency. *Environmental Psychology Open, 29*, 24. https://doi.org/10.69805/epo.v29.a24

Submitted 4 November 2024, accepted 2 June 2025, published 16 June 2025

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Abstract

Addressing the ecological crisis requires demand-side mitigation, but sufficiency strategies which aim to limit consumption are regarded as detrimental to well-being, creating a barrier to necessary change. This study investigated the Collegium Academicum (CA) student home where shared living is practised with a strong focus on sufficiency, characterised by large communal areas and self-organised infrastructures. We examined whether such sufficiency settings can relate to a changed perspective on shared living and sufficiency compared to ordinary shared living environments. Data from 159 residents—73 from the CA and 86 from a standard student home—revealed that CA residents found greater meaning in shared living, showed more positive attitudes towards sufficiency, and stronger shared living intentions. Specific experiences of shared living had a delayed positive effect on perceived meaningfulness. These findings suggest that sufficiency settings can strengthen sufficiency-oriented lifestyles. Future research should investigate these settings using rigorous pre-post study designs.

Keywords

field study, sufficiency, meaning construction, setting, longitudinal study

Impact statement

In this study we investigated how different living environments can influence attitudes, behaviour and meaning related to shared living and sufficiency by comparing two different student homes. Our data show that intense experiences of shared living relate positively to perceiving shared living as something purposeful and valuable. This can be linked to the adequate infrastructure and self-organised community of the Collegium Academicum (CA) student home. Put in a broader context, this illustrates how the acceptance of sufficiency-oriented living can be supported by creating living environments that allow the collection of first-hand experiences of sufficiency. On a policy level this may implicate a stronger support for projects such as the CA that practice sufficiency on a daily basis. However, our study did not find significant changes for CA residents over time. Therefore, we have limited insights into the exact causes of the differences measured between the student homes.

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Zusammenfassung

Die Bewältigung der ökologischen Krise erfordert eine Reduktion der Konsumnachfrage. Jedoch werden Suffizienzstrategien, die auf eine Begrenzung des Verbrauchs abzielen, oft als nachteilig für das individuelle Wohlbefinden wahrgenommen, was ein Hindernis für notwendige Veränderungen darstellt. Diese Studie untersuchte das Collegium Academicum (CA) als Studierendenwohnheim, in dem gemeinschaftliches Wohnen mit einem starken Fokus auf Suffizienz praktiziert wird, gekennzeichnet durch große Gemeinschaftsflächen und selbstorganisierte Infrastrukturen. Wir analysieren, ob solche Suffizienzsettings im Vergleich zu gewöhnlichen Studierendenwohnheimen zu einer veränderten Perspektive auf gemeinschaftliches Wohnen und Suffizienz führen. Die Daten von 159 Bewohner:innen – 73 aus dem CA und 86 aus einem zweiten Studierendenwohnheim – ergaben bei CA-Bewohner:innen ein höheres Sinnerleben gemeinschaftlichen Wohnens, eine positivere Einstellung gegenüber Suffizienz und stärkere Absichten gemeinschaftlich zu wohnen. Bestimmte Erfahrungen gemeinschaftlichen Wohnens hatten dabei einen verzögerten positiven Einfluss auf das Sinnerleben. Die Ergebnisse deuten darauf hin, dass Suffizienzsettings suffizienzorientierte Lebensstile stärken können. Zukünftige Forschungen sollten diese Settings mit rigorosen Prä-Post-Studiendesigns untersuchen.

Schlüsselwörter

Suffizienz, Feldstudie, Sinnkonstruktion, Setting, Längsschnittstudie

Impact-Statement

In dieser Studie haben wir durch den Vergleich von zwei verschiedenen Wohnheimen untersucht, wie unterschiedliche Wohnumfelder Einstellungen, Verhalten und das Sinnerleben gemeinschaftlichen Wohnens und der Suffizienz beeinflussen können. Unsere Daten zeigen einen positiven Zusammenhang zwischen intensiven Erfahrungen und der persönlichen Wahrnehmung gemeinschaftlichen Wohnens als bedeutungsvoll und wertvoll. Dies kann mit geeigneten Infrastrukturen und der selbstorganisierten Gemeinschaft des Collegium Academicum (CA) Wohnheims in Verbindung gebracht werden. In einem größeren Kontext zeigt es, wie die Akzeptanz für eine suffizienzorientierte Lebensweise durch die Schaffung von Wohnumgebungen unterstützt werden kann, die alltägliche Erfahrungen von Suffizienz ermöglichen. Auf politischer Ebene könnte sich daraus eine stärkere Unterstützung für Projekte wie dem CA ableiten, welche Suffizienz in ihrem Alltag integrieren. In unserer Studie wurden jedoch keine signifikanten Veränderungen bei Bewohner:innen des CA im Laufe der Zeit festgestellt. Daher haben wir nur begrenzte Erkenntnisse über die genauen Ursachen der gemessenen Unterschiede zwischen den Wohnheimen.

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1 Introduction

1.1 Sufficiency: Necessities, potentials and barriers

The ecological crisis is a pressing reality. Currently, six out of nine planetary boundaries which delineate the safe operating space for humanity, have been transgressed (Richardson et al., 2023). In addition to technological innovations and efficiency gains, demand-side mitigation in energy and resource consumption is necessary (Creutzig, Roy, et al., 2022). The sufficiency approach to sustainability describes practices such as absolute reduction of consumption, sharing, increasing product longevity and modal shifts which lead to reduced consumption (Sandberg, 2021). On an individual level they can be combined into a sufficiency-oriented lifestyle (Kropfeld, 2023). Therefore, sufficiency aims for social innovation and behavioural changes as means of achieving sustainability (Lage, 2022). Properly implemented, sufficiency can meet human needs while setting limits on resource demands (Linz, 2004). Current evidence suggests that this promise of sufficiency may hold true. Studies consistently report a positive relationship between practising sufficiency-oriented lifestyles and subjective well-being (Hook et al., 2023; Vollebregt et al., 2024; Zawadzki et al., 2020). However, in industrialised countries, sufficiency-oriented lifestyles are practiced only by a few "voluntary simplifiers" (Huneke, 2005). To achieve a wider adoption of sufficiency-oriented lifestyles, changes in infrastructure are needed as well as altering the way in which sufficiency-oriented living is perceived by a majority of people. Adopting a lifestyle of reduced consumption is often accused of being detrimental to well-being (Kasser, 2002, p. 4). Portraying climate action as having a negative impact on well-being is a powerful justification for the lack of transformative efforts (Lamb et al., 2020). It is therefore necessary to develop new narratives that promote a good life without material excess (Tröger & Reese, 2021). This includes recognising the potential positive impact of sufficiency strategies on people and the planet.

But how can existing perspectives on sufficiency be changed and sufficiency-oriented lifestyles be promoted? Drawing on theories of meaning construction, we argue that sufficiency needs to be experienced first-hand through environments that can provide valuable experiences of sufficiency-oriented living. To test our assumptions, we compared two different student accommodations that facilitate experiences of sufficiency to varying degrees. The Collegium Academicum [CA] as a self-organised student home which promotes shared living with a strong focus on sufficiency (https://collegiumacademicum.de/) as well as a standard student home with limited opportunities to engage in sufficiency-oriented living. We tested whether living in one of the student homes would be associated with different experiences of shared living and examined differences in individual perspectives of sufficiency indicated by sufficiency attitudes, the meaningfulness of shared living, and intentions to choose shared living arrangements in the future.

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1.2 Shared living as sufficiency in practice

Housing, encompassing the aggregated environmental impact of buildings, heating and electricity, accounts for a significant share in the material footprint of private households in Germany (Buhl et al., 2019). Primarily, technology-driven solutions have been proposed as measures to enhance sustainability (Wang & Adeli, 2014). However, to achieve the necessary reduction in consumption, demand-side mitigation through sufficiency measures is essential (Lorek & Spangenberg, 2019). In Germany, living space per capita has consistently increased in the past decades (Deschermeier & Henger, 2015), leading to a heightened overall material footprint of housing (Buhl et al., 2018). Obviously, with all other factors held constant, more space requires more energy to heat, cool, ventilate and light (Lorek & Spangenberg, 2019). To counteract this trend, sharing living space, reducing living space and shifting housing types have been introduced as ways to practise sufficiency in housing (Sandberg, 2021). Micro-apartments and tiny houses are prominent examples of smaller-sized dwellings that lead to a reduction in living space with less energy and resource consumption (Hein, 2021; Shearer & Burton, 2019). Shifts in housing types refer to moving from detached houses to apartments, resulting in increased density of living space, which conserves energy and reduces soil sealing (Lorek & Spangenberg, 2019). Sharing living space entails sharing a home with other occupants, either entirely or in functional parts, such as recreational areas, offices or laundry. This results in a smaller per-capita consumption of resources (Williams, 2007). However, shared living not only reduces the environmental impact of housing but can offer additional ecological benefits in other consumption categories. Smaller private living spaces and the availability of shared options increase the likelihood of limiting possessions and adopting other sharing behaviours (Bagheri et al., 2025). In the area of miscellaneous consumption, resources can be saved by sharing everyday items (Klocker et al., 2016; Meltzer, 2000). Furthermore, shared living facilitates the adoption of shared mobility (Grenzdörfer & Kratzsch, 2019). Thus, living in shared settings can mitigate the housing-related consumption demand, but it may also encourage other behaviours that align with sufficiency. To increase forms of shared living is therefore an important strategy for the advancement of sufficiency. However, not every form of shared living is complemented with the idea of sufficiency-oriented living. As mentioned before, shared living must provide a form of housing that satisfies the needs of the people living in it. To share living space with others simply for the reason of being poor or for the lack of alternatives does not serve sufficiency (Fuchs et al., 2021). Therefore, forms of shared living have to provide valuable uses in order to become an attractive alternative to private living (Fischer & Grießhammer, 2013; Riefler et al., 2024). These uses may be promoted through making experiences of shared living in specific settings. Through daily experiences, living in a community may become more important than having large private spaces.

1.3 Co-housing and student homes as different settings of shared living

Settings can be defined as a "place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and wellbeing" (World Health Organization, 2021, p. 30). Typically,

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settings are confined to specific locations, involve participants who play different roles and possess an organisational framework (Engelmann & Halkow, 2008). Originally, in the context of ecological psychology, behaviour settings were proposed as a concept to investigate human-environment interactions (Barker, 1968). Focusing on settings allows interventions not only at the micro-level of individuals but also at the meso-level of social and spatial structures (Abbema et al., 2004). Each setting provides a specific set of experiences that shape learning, meaning-making and well-being (Billett, 2014). Thus, by participating in suitable settings, individuals can be empowered to live a healthier and more sustainable life (Engelmann & Halkow, 2008; Hunecke, 2022).

Student homes and co-housing are two settings in which shared living is practised. Student homes aim to provide housing for groups with specific needs, such as apprentices or students. Approximately 15.5% of all German students reside in student homes (Constata UG, 2021). In this way, many students experience shared living in their everyday lives, and these experiences are likely to influence their attitudes and behaviour towards shared living. Therefore, it is important to reflect on how student homes as settings of shared living can be designed to promote sufficiency. If student homes provide valuable experiences of shared living, they may contribute to a social diffusion of sufficiency-oriented lifestyles (Hunecke, 2022, p. 60). On average, shared living in student homes appears to primarily serve instrumental purposes. Students report low rent and proximity to the university as the major reasons for choosing student housing (Wank et al., 2009). Co-housing is another setting of shared living where sufficiency is addressed more explicitly. Co-housing combines private and communal areas to foster community and at the same time preserve privacy (Sandberg, 2021). In co-housing arrangements, residents usually manage the building's facilities and community living in self-organisation (Lietaert, 2010). The desire to live with others is a central motivation for individuals to join co-housing projects (Choi, 2013). Living in co-housing communities has beneficial social and environmental effects. Members of co-housing communities are shown to have a significantly smaller than average ecological footprint (Daly, 2017). Furthermore, co-housing arrangements may enhance the well-being and health of their occupants. In general, living alone can pose a risk to health and well-being (Tamminen et al., 2019). On the other hand, co-housing seems to be positively associated with well-being and health, although the quality of evidence is too low to draw causal conclusions (Carrere et al., 2020). Co-housing is a setting in which shared living is sustainable and can have positive social effects, such as supporting social interaction and community building (Sandberg, 2021). For this reason, it is regarded as a social innovation for sufficiency (Bagheri et al., 2025). Consequently, the ecological and social impact of shared living settings depends on the community's goals and the infrastructure provided. In fact, both factors seem to be closely intertwined. Co-housing infrastructures often include common areas, workshops and domestic appliances and are managed by intentional communities (Jarvis, 2011). Residents consciously form intentional communities for specific purposes which usually encompass sharing or other sufficiency-oriented goals (Nelson, 2018; Shenker, 1986). As a result, shared housing projects tend to have a lower environmental impact when organised by intentional communities (Daly, 2017).

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Consequently, student home settings may be more successful in providing valuable shared living experiences if they incorporate elements of co-housing. Self-organisation, the availability of common spaces and sharing activities may therefore characterise student housing as a sufficiency setting of shared living.

1.4 Theories of meaning construction

Theories of meaning construction offer a framework to analyse how student housing can influence individual perspectives of sufficiency. Meaning construction is an evaluative process where experiences in a given situation are reviewed against an individual's current goals, beliefs and expectancies that form a global meaning system (Hunecke, 2022; Park, 2010). The presence of meaning is the outcome of successful meaning construction and is characterised by a sense of purpose, coherence and significance (Martela & Steger, 2016). Having meaning can be regarded as a marker of eudaimonic well-being (Heintzelman, 2018). Eudaimonic well-being is derived from living in alignment with one's true self, pursuing meaningful goals and realising one's potential. It emphasises personal growth and the fulfilment that arises from engaging in intrinsically valuable activities (Ryan et al., 2008; Waterman et al., 2008). People find meaning in shared living when experiences of shared living match the content of their meaning system. Prominent sources of meaning within the global meaning system include values and goals that revolve around self-transcendence, relatedness and self-actualisation (Delle Fave, 2020). Consumption behaviours create meaning, if they can be connected to these eudaimonic pursuits (Jain et al., 2023). The same has been shown for sufficiency-oriented lifestyles such as voluntary simplicity, minimalism and consumption reduction (Hook et al., 2023; Vollebregt et al., 2024).

Some experiences have the power to change a personal meaning system. Profound changes in how individuals perceive meaning often result from significant life events or crises (Park, 2010). For instance, during the Covid-19 lockdown in Germany, many individuals not only experienced disruptions to their daily routines with new forms of consumption and leisure, but also profoundly reflected on their values and goals in response to the new living circumstances (Hüppauff et al., 2022). However, as Delle Fave (2020, p. 3) emphasised, changes in the personal meaning system do not always occur in the context of dealing with a crisis: "it can also be an enjoyable and proactive experience, providing opportunities for exploration of new life avenues and fostering complexity in the person's meaning system". Following this perspective, student homes as settings of shared living may hold potential as a leverage point for fostering the meaningfulness of sufficiency. Whether or not living in a student home encourages meaning construction towards shared living depends on the quality of experiences that are made in the specific setting. To make experiences of shared living more meaningful, student homes require a supportive infrastructure such as attractive communal spaces and a community that is organised around social activities and joint consumption practices. This may be achieved if student homes incorporate elements of co-housing as these settings have demonstrated positive environmental and social effects (Carrere et al., 2020; Daly, 2017). Therefore, if a student home provides self-organisation, attractive public spaces, community activities and a sharing culture it may

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stimulate meaning construction towards sufficiency-oriented shared living concepts.

1.5 Self-reflection and insight as personal abilities that potentially support the integration of experiences

In addition to setting-related experiences, the meaning construction of shared living may be complemented by factors at the individual level. If personal experiences are consciously reflected upon, they may be more easily integrated into an individual's global meaning. In the context of sufficiency, consciously reflecting on experiences may be part of a psychological resource to strengthen sustainability-oriented sources of meaning (Hunecke, 2022, p. 84). However, there is limited evidence as to whether reflective practice has an impact on meanings in relation to sufficiency (Kasser et al., 2014; Tröger et al., 2021). If a reflective search for meaning does not lead to integration, it poses the danger of rumination with negative effects on well-being (Schnell, 2021, pp. 105–106; Steger et al., 2008). Thus, insight may be another meta-cognitive ability influencing the successful integration of experiences. A person with high insight possesses a high understanding of their own thoughts, feelings and behaviour (Grant et al., 2002). Consequently, this ability might support the successful integration of experiences made in a specific setting.

1.6 The present study

In this study, we employed a longitudinal field study design to investigate different student homes as settings of shared living. The central research question was if student homes that incorporate elements of co-housing can strengthen individual perspectives of sufficiency in general and shared living specifically through providing different experiences of shared living.

To test for setting-related differences, we surveyed residents from two different student homes. Both student homes were located in Heidelberg, in Baden-Württemberg, Germany. The Collegium Academicum [CA] represents a shared living environment focused on sufficiency and accommodates individuals in their educational phase (students and apprentices). The project was initiated by a group of volunteers to create an affordable, self-managed and sustainable living space. The main building has been newly constructed with high standards in energy efficiency, innovative building materials and a focus on sustainable infrastructure that aims to facilitate sufficiency-oriented living. All residents are part of the community that manages the student home through self-organisation. In our deducted hypotheses we referred to this kind of student housing as a sufficiency setting of shared living because like other co-housing initiatives it offers supportive infrastructure and a self-organised community. We compared the CA with another student home in the same neighbourhood, administered and operated by the Studierendenwerk, a state-funded organisation, that is the primary provider of student homes in Germany (Nau & Schlitt, 2022). Although it is a setting where shared living is practised, there is no organisational or infrastructural framework focusing on sufficiency.

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In a first step, we aimed to test the relationships of our theoretical constructs in line with the reviewed theory concerning mechanisms of meaning construction (section 1.4). We expected that making certain experiences of shared living more frequently would relate to a higher meaningfulness of shared living. As described in section 1.3, valuable experiences of shared living may be related to self-organisation, social activities and the use of shared infrastructure. Moreover, we aimed to confirm the proposed relationship between shared living and sufficiency-orientation. We tested whether meaningfulness of shared living would be connected to more positive evaluations of sufficiency-oriented lifestyles, such as sufficiency attitudes (Verfuerth et al., 2019) and the intention to choose shared forms of living in the future.

H1. Meaningfulness of shared living is positively connected to experiences of shared living (H1a), sufficiency attitudes (H1b) and intentions of shared living (H1c).

The second part of the proposed hypotheses focused on the differences between the investigated student homes. Because the sufficiency setting is characterised by a student home that incorporates elements of co-housing, we expected that experiences that relate to these elements would be reported more frequently in the sufficiency setting than in the control setting. We deducted the following hypotheses:

H2. Experiences of shared living will be more frequent in the sufficiency setting than in the control setting.

H3. There will be a larger number of shared objects in the sufficiency setting than in the control setting.

Furthermore, we predicted that based on the differences in experiences made, shared living in a sufficiency-oriented student home would enhance the meaning of shared living.

H4. Members of the sufficiency setting will report a higher meaning of shared living than control setting members (H4a). With more time spent in the sufficiency setting, members of the sufficiency setting will increase their meaning of shared living (H4b).

Additionally, we aimed to investigate the diffusion potential of sufficiency-oriented student homes. Student homes may be well suited for the diffusion of alternative forms of living, as they are inhabited by younger individuals during their tertiary education. The experiences made during this time are likely to influence future decisions regarding their living arrangements. Valuable experiences of shared living may lead to stronger intentions to pursue shared forms of living. Thus, we tested the following hypothesis:

H5. Members of the sufficiency setting will report stronger behavioural intentions of shared living than control setting members.

In this context, another relevant question is whether living in a sufficiency setting would also lead to more positive sufficiency attitudes in general:

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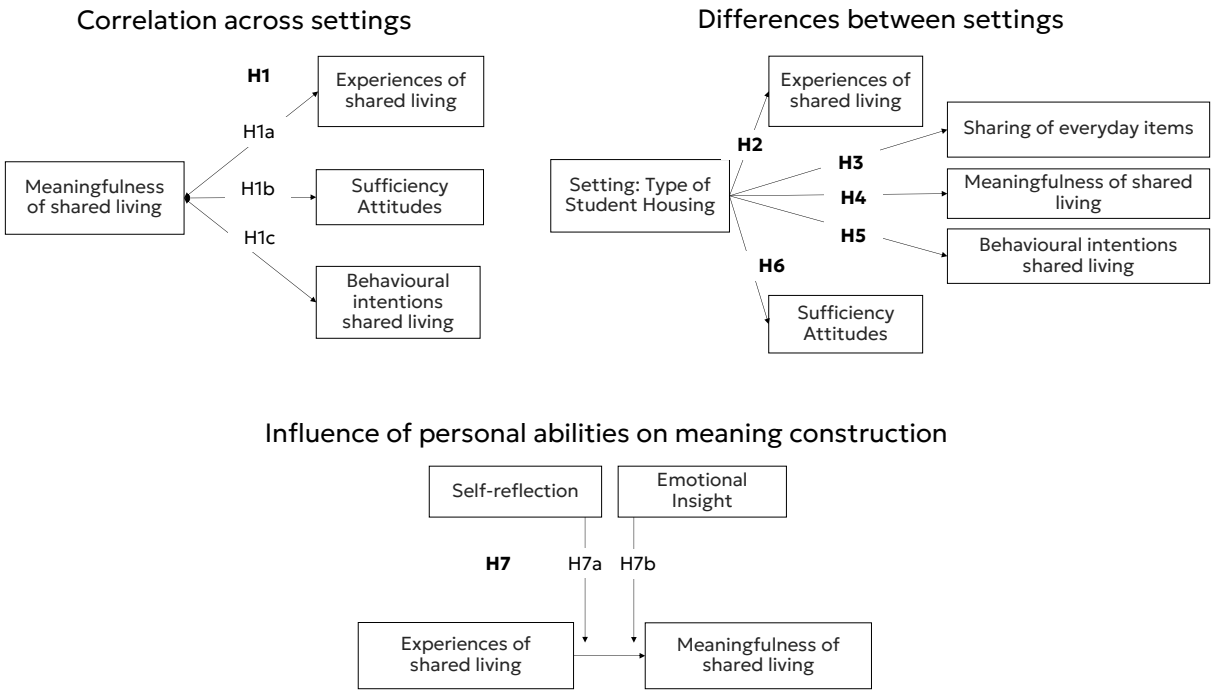
H6. Members of the sufficiency setting will report more positive sufficiency attitudes than control setting members (H6a). With more time spent in the sufficiency setting, members of the sufficiency setting will develop more positive sufficiency attitudes (H6b).

Lastly, we focused on dispositional factors that may facilitate the integration of experiences into the global meaning system. As outlined in section 1.5, self-reflection and insight describe similar but independent abilities of a person that may have the potential to positively influence the integration of experiences.

H7. The relationship between experiences of shared living and the meaning of shared living will be stronger for participants who frequently engage in reflection (H7a). The relationship between experiences of shared living and the meaning of shared living will be stronger for participants who report high levels of insight (H7b).

Figure 1

Graphical overview of preregistered hypotheses.



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2 Methods

2.1 Design and procedure

We preregistered study procedures prior to data collection at OSF (https://osf.io/w9dxf). A report regarding deviations from the preregistration, the full questionnaire, data, R scripts and the preregistration of the data exclusion plan can be found in the corresponding OSF project (https://osf.io/wjaez/). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee of Ruhr University Bochum (Faculty of Psychology, Case No. 890) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants involved in the study.

We conducted a longitudinal field study with a 2(time) × 2(setting) design to test our hypotheses. Field studies offer the opportunity to collect observations in daily environments and are an established method for investigating settings (Steg et al., 2019). We compared two different student homes in Heidelberg, Germany, in Baden-Württemberg. The CA as a sufficiency setting and another student home in the same neighbourhood. Unlike other student homes, the CA incorporates important aspects of co-housing (see Table 1). The student home is self-organised and provides infrastructure that supports sufficiency-oriented living, including large communal spaces inside and outside, shared workshops and permaculture gardening. The main building opened for residents in 2023. Individual room sizes range from 7 to 14 square metres, with rent set at €375 per person per room. At the time of the study, 176 residents lived in the student home. We also surveyed residents of a state-funded student home in the same city district. This student home, built in 1950 and completely renovated in 1990, offers accommodation for 619 students. Rent ranges from €218 to €360 per person, with room sizes ranging from 11 to 34 square metres. The main communal area is a large outside courtyard which is framed by the residential buildings. Consequently, it can be regarded as an average student home that offers limited opportunities for communal living, sufficiency and self-organisation (see Table 1).

In both survey waves, data were gathered from residents currently living in the student homes. Consequently, student home membership was self-selected. The survey was conducted online using SoSci-Survey (Leiner, 2024). Since a significant portion of students living in student homes were international (Wank et al., 2009), we provided the survey in both English and German. Where necessary, scales were translated by the research team and re-translated by a native speaker. The study was advertised via the student home email newsletters, and flyers and posters were distributed on the premises. As an incentive, 20×€20 food vouchers were raffled. The first data wave was collected from 7/11/23 until 12/17/23. In the first section, "Living in a residence hall", participants were asked about their current living conditions in the student home, including experiences of shared living. Subsequently, participants evaluated the meaningfulness of their experiences and had the opportunity to document important learnings from shared living in the student home. In the next section, "Satisfaction concerning the residence hall", participants reported their current residential satisfaction and their intention to choose shared

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forms of living in the future. This section was followed by "Questions about yourself" that assessed attitudes and meta-cognitive abilities at a personal level. Finally, under "Personal information", participants provided sociodemographic information. On the last page, participants were asked to enter an email address, which was used to send out the second-wave survey. The survey took approximately 15 minutes to complete. The second wave questionnaire was sent out individually exactly four months after participants completed the first questionnaire. We chose this time interval for several reasons. Firstly, it was important that the participants had the opportunity to make all investigated experiences of shared living on a regular basis and secondly it was also important to end the measurement interval before the end of the summer term to avoid dropout due to exams and the general fluctuation in student home residents during summer break. Two reminders were sent out automatically after the first and the second week of the second wave. The survey closed on 05/06/24. In the first section of the second survey, participants were able to report any changes in their living situation that occurred during the last four months. Thereafter, the same scales used in wave 1 were completed by the participants, excluding the sociodemographic section. On the last page, participants were given the opportunity to leave final remarks and participate in the voucher raffle.

2.2 Participants

To maximise statistical power, we aimed to acquire as many participants as possible within the given time frame. Since the study design and theoretical scope are more exploratory, we did not have specific effect sizes for reference. To test for mixed factorial main and interaction effects, we aimed for a sample size of at least 100 participants in each setting and time point (Brysbaert, 2019). We acquired $N_{t1} = 244$ in the first wave and $N_{t2} = 174$ in the second wave, resulting in a 27.5% attrition rate. In the first wave, substantially fewer participants were recruited in the CA ($n_{Diff} = 48$). Due to a higher attrition rate in the standard student home, this difference was decreased in the second wave ($n_{Diff} = 18$). We excluded $n = 4$ participants who had a relative speeding index of $time\_rsi > 2.0$ (Leiner, 2019) and $n = 11$ participants because they moved out of the student home before the second survey wave was conducted. This led to a final sample size of $N = 159$.

Table 1 lists the demographics separately for each student home. Participants were comparable in terms of age and education levels, although the CA had more residents with a university degree. The standard student home had a higher proportion of international students and larger average room size on average. Residents in the CA reported environmental motivation and self-organisation as their main reasons for moving into the student home compared to financial benefits and lack of alternatives in the standard student home. On average, residents lived in the standard student home for a longer duration, although there is substantial variance among residents.

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Table 1

Characteristics of student homes investigated as settings of shared living including sample description

Variable	Collegium Academicum	Standard student home
N_{t1}	97	145
N_{t2}	78	96
N_{final}	73	86
Age	M = 22.33, SD = 2.36	M = 22.03, SD = 2.21
Education	UEQ = 72.6%, UD = 20.5%	UEQ = 72.1%, UD = 26.7%
Gender	n_{female} = 45, n_{male} = 22, $n_{diverse}$ = 2	n_{female} = 54, n_{male} = 30, $n_{diverse}$ = 1
Proportion of internationals	1.5%	20.9%
Room size (m^2)	M = 9.11, SD = 3.23	M = 22.5, SD = 8.08
Reasons for moving in	Environmentally friendly living (68.5%), living in a self-organised community (52.1%)	Low rent (79.1%), no appropriate alternatives (38.4%)
Duration of residence (days)	M = 270, SD = 108	M = 630, SD = 539
Shared spaces within the flat	Communal room including kitchen facilities	Shared kitchen
Community spaces outside flat	Outside and inside	Only outside
Organisational structure	Self-organised by residents	Managed by the Studierendenwerk
Other facilities to support sufficiency	Bike-repair workshop, wood workshop, community gardening, shared mobility	Shared mobility

Note. UEQ = university entrance qualification, UD = university degree

2.3 Materials

Herein, we provide an overview of the self-report measures used to investigate our hypotheses. In addition to the scales presented, we also assessed resident satisfaction, personal ecological norm and an open question format that asked for learnings from living in a student home. The full questionnaire is available in the OSF Forum (https://osf.io/wjaez/). Unless stated otherwise, items were rated on a response scale ranging from 1 (*"fully disagree"*) to 7 ("*fully agree"*).

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2.3.1 Intentions of future shared living

We used six items to assess whether current student home residents would also choose a shared form of living in the future ("After my time in the residence hall, I would like to share a flat with other people", "I can well imagine continuing to live in a shared housing project after moving out of the residence hall", α_{t1} = .89, α_{t2} = .89).

2.3.2 Sufficiency attitudes

We employed the scale by Verfuerth et al. (2019) to measure attitudes towards a sufficiency-oriented lifestyle ("Through my lifestyle I want to use as little resources as possible", "All the new things that are sold all the time are a big waste of resources to me"). Internal consistency was α_{t1} = .85 and α_{t2} = .84.

2.3.3 Meaningfulness of shared living

To measure the meaningfulness of shared living, participants were asked, "How would you rate your experiences and activities around the shared living in your residence hall?" (adapted from Huta & Ryan, 2010) and then rated 11 items ("Meaningful", "Valuable", "Dear to me", α_{t1} = .96, α_{t2} = .97).

2.3.4 Personal reflection and emotional insight

We used the Self-Reflection and Insight Scale (SRIS; Grant et al., 2002; German translation by Meyen, 2016) to assess personal reflection ("I frequently examine my feelings", α_{t1} = .79, α_{t2} = .73) and insight ("I usually know why I feel the way I do", α_{t1} = .87, α_{t2} = .86) as meta-cognitive abilities.

2.3.5 Experiences of shared living

We employed 12 items to assess the frequency of experienced shared living activities. Participants rated how often they engaged in various activities (1 *"never"* – 7 *"multiple times a day"*, GESIS – Leibniz-Institut für Sozialwissenschaften, 2018). Based on a review of co-housing literature, we asked about activities related to self-organisation ("Participation in plenary meetings on the organisation/administration of the residence hall"), activities with other residents ("Cooking together with the residents of the residence hall") and time spent in common areas ("Spending more than 15 minutes in shared areas of the shared flat [shared room, kitchen]").

2.3.6 Sharing of everyday items

We also measured the extent to which participants shared everyday items with other residents. Subjects used visual analogue scales to indicate the percentage of regularly shared items across seven categories (kitchen, electronics & entertainment, leisure, mobility, food, accounts, clothing) from 0% (*"nothing shared"*) to 100% ("*everything shared"*).

2.4 Analytic strategy

We conducted confirmatory and exploratory analyses. All hypotheses were tested against a 5% significance level. Analyses were performed using R Statistical Software (Posit team, 2024; R Core Team, 2024). Additionally we used the following R packages for data preparation, cleaning and analyses: Tidyverse (Wickham et al., 2019), Psych (Revelle, 2024), tidySEM (van Lissa, 2022), apaTables (Stanley,

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2021), afex (Singmann et al., 2024), emmeans (Lenth et al., 2024), effsize (Torchiano, 2020), car (Fox et al., 2023), s2 (Dunnington et al., 2024), readxl (Wickham & Bryan, 2023), openxlsx (Schauberger et al., 2024), misty (Yanagida, 2024), interactions (Long, 2024).

For H1, we calculated Pearson correlation coefficients between the meaningfulness of shared living, experiences of shared living, sufficiency attitudes and intentions of shared living across settings and for both time points. To test H2 – H6, we calculated separate analysis of variance models (ANOVA) with timepoint and setting membership as independent variables and experience of shared living (H2), sharing of everyday objects (H3), meaning of shared living (H4), intentions of future shared living (H5) and sufficiency attitudes (H6) as dependent variables. Due to acquiring fewer participants than expected, we deviated from our preregistered data analysis procedure and calculated ANOVA instead of multivariate analysis of variance (MANOVA) models. For H7, we calculated two separate moderated regression models, including experiences of shared living, self-reflection (H7a) and insight (H7b) as independent variables. For each variable, we calculated an overall mean across both time points. In an exploratory analysis, we tested whether experiences of shared living could be linked to the meaningfulness of shared living across time points by calculating a cross-lagged panel model.

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3 Results

3.1 Correlational analyses across settings

As predicted, the meaningfulness of shared living was positively connected to experiences of shared living, $r_{t1}(157) = .68$, $p < .001$, $r_{t2}(157) = .74$, $p < .001$. Furthermore, meaningfulness of shared living was also positively related to sufficiency attitudes, $r_{t1}(157) = .40$, $p < .001$, $r_{t2}(157) = .40$, $p < .001$, and intentions of future shared living, $r_{t1}(157) = .54$, $p < .001$, $r_{t2}(157) = .63$, $p < .001$. An overview of the intercorrelations of variables, including descriptives, is shown in Table 2.

Table 2

Means, standard deviations and correlations of variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SA_t1	4.99	1.11													
2. SA_t2	5.07	1.03	.85**												
3. SR_t1	5.78	0.86	.08	.09											
4. SR_t2	5.54	0.88	.03	.10	.62**										
5. Ins_t1	4.93	1.06	-.07	-.02	.26**	.23**									
6. Ins_t2	4.94	0.97	-.13	-.12	.16*	.22**	.74**								
7. Mng_t1	5.19	1.44	.40**	.37**	-.06	-.13	-.11	-.14							
8. Mng_t2	5.10	1.54	.41**	.40**	-.04	-.12	-.15	-.14	.81**						
9. BI_t1	4.69	1.51	.49**	.48**	-.21**	-.26**	-.14	-.17*	.54**	.52**					
10. BI_t2	4.63	1.53	.53**	.46**	-.16*	-.24**	-.23**	-.18*	.55**	.63**	.82**				
11. Sha_t1	35.68	21.78	.38**	.31**	-.14	-.17*	-.11	-.13	.53**	.54**	.50**	.52**			
12. Sha_t2	34.34	21.22	.44**	.38**	-.15	-.17*	-.17*	-.14	.61**	.61**	.56**	.57**	.84**		
13. Exp_t1	2.65	0.90	.40**	.37**	-.12	-.14	-.12	-.14	.68**	.69**	.62**	.61**	.79**	.81**	
14. Exp_t2	2.55	0.88	.43**	.38**	-.13	-.14	-.08	-.11	.66**	.74**	.57**	.58**	.76**	.80**	.89**

Note. *M* and *SD* represent mean and standard deviation, respectively. * indicates $p < .05$. ** indicates $p < .01$. SA = sufficiency attitudes, SR = self-reflection, Ins = insight, Mng = meaning, BI = behavioural intentions, Sha = sharing, Exp = experiences of shared living.

3.2 Mixed models to analyse differences between settings

In the first step, we tested whether experiences of shared living were higher in the CA student home. As predicted, results indicated a significant main effect of student home setting on experiences of shared living, $F(1, 156) = 235.07$, $p < .001$, $\eta^2 = .569$. Furthermore, the model indicated a significant effect for time, $F(1, 156) = 9.14$, $p = .003$, $\eta^2 = .007$, which reflects an overall decrease in the frequency of experienced activities, and a non-significant interaction, $F(1, 156) = 0.003$, $p = .957$. Additionally, a consistent main effect for setting indicated that CA residents reported a higher meaning of shared living, $F(1, 156) = 79.12$, $p < .001$,

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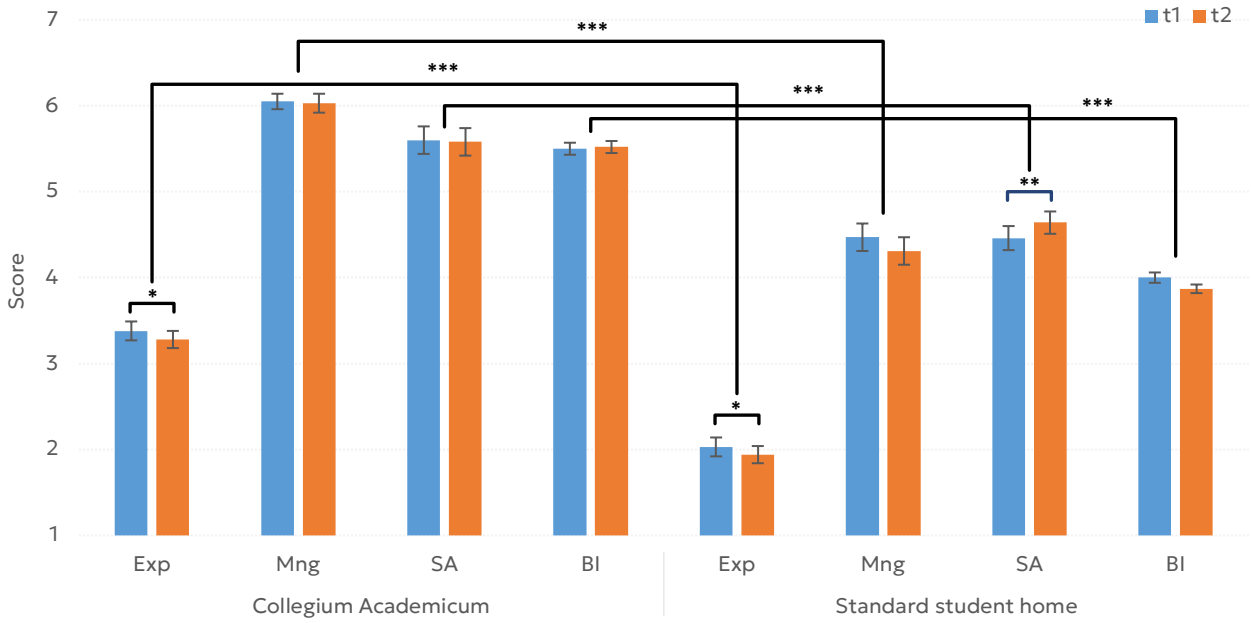
$\eta^2 = .304$, sufficiency attitudes, $F(1, 156) = 56.46$, $p < .001$, $\eta^2 = .246$, sharing of everyday objects, $F(1, 156) = 323.37$, $p < .001$, $\eta^2 = .570$, and behavioural intentions of shared living, $F(1, 156) = 64.37$, $p < .001$, $\eta^2 = .266$ (see Figure 1), while there was no significant main effect of time. A small time × setting interaction effect was observed for sufficiency attitudes, $F(1, 156) = 4.98$, $p = .027$, $\eta^2 = .003$, with sufficiency attitudes increasing over time in the control setting but not in the CA.

Figure 2

Dependent variable means depicted separately for time and setting.



Note. Error bars represent standard errors of the mean. Exp = experiences of shared living, Mng = meaning, SA = sufficiency attitudes, BI = behavioural intentions. ***$p < .001$, *$p < .05$.

3.3 Moderation analysis

The moderated regression model revealed neither a main effect of self-reflection, $b = 0.29$, $SE = 0.38$, $p = .442$, nor a significant interaction of self-reflection × residence, $b = -0.23$, $SE = 0.24$, $p = .330$. Testing the second moderated regression yielded no significant results for the main effect of insight, $b = 0.47$, $SE = 0.32$, $p = .144$, as well as the insight × residence interaction, $b = -0.34$, $SE = 0.20$, $p = .087$.

3.4 Cross-lagged panel model of experience on meaning

In order to get a clearer understanding whether the different experiences in the investigated settings account for the differences in meaningfulness of shared living, we calculated an exploratory cross-lagged panel model to test the associations of experience and meaning over time. The results indicated significant cross-lagged effects for meaning and experience (see Figure 2). Model comparison indicated a significant difference between cross-lagged paths, $\Delta\chi^2 = 10.96$, $p < .001$, $\omega = .263$,

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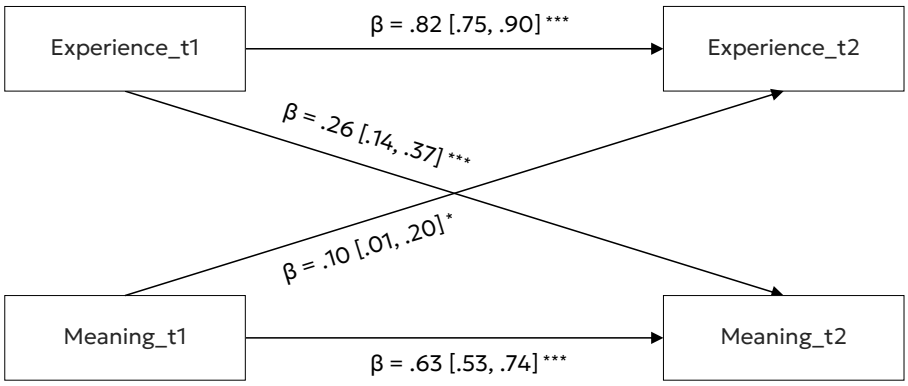
indicating a significantly higher cross-lagged effect of experience on meaning than with meaning on experience.

Figure 3

Standardised associations, including confidence intervals, between the experience of shared living and the meaningfulness of shared living over time.



Note. $^{*}p < .05$, $^{***}p < .001$.

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4 Discussion

4.1 Summary of the results and theoretical contribution

To reach sustainability targets it is necessary to limit consumption demand by implementing sufficiency strategies. Changing consumption towards sufficiency needs adequate infrastructures as well as new perspectives on sufficiency-oriented living. In this study we explored how sufficiency settings such as the CA can contribute to meanings, attitudes and behaviour related to sufficiency.

In a first step we tested the relationship between experiences of shared living, meaningfulness of shared living, sufficiency attitudes and intentions to choose shared living settings in the future. The correlational findings confirm the proposed theoretical assumptions for participants both in the CA as well as the standard student home setting. The positive relationship between experiences and meaningfulness of shared living illustrates the central role that experiences play in shaping meaning (Delle Fave, 2020). Furthermore, the meaningfulness of shared living is also related to positive attitudes towards sufficiency. These results indicate that the connection between shared living and sufficiency is not merely conceptual but resonates empirically within the participants' attitudes. Meaningfulness of shared living is also positively connected to future intentions to choose shared forms of living. This highlights that perceiving experiences as meaningful can indicate a form of autonomous motivation to engage in behaviour for intrinsic reasons (Venhoeven et al., 2013).

Comparing the CA with a standard student home situated in the same neighbourhood reveals, as expected, that CA residents more frequently make experiences related to self-organisation, social activities and time spent in communal areas. This confirms that shared living in the CA is practised differently compared to a standard student home by incorporating elements of co-housing. This is further reflected in the higher proportion of shared items across categories, illustrating that sufficiency in the context of housing can have beneficial effects on other areas of consumption (Klocker et al., 2016; Meltzer, 2000). The limited private space can lead to fewer personal possessions and increase the need for sharing items among residents (Bagheri et al., 2025). Together, these findings underscore our assumption that the two investigated settings differ in key aspects related to sufficiency. Specific experiences of shared living and sharing characterise the CA as a sufficiency setting. Meaningfulness of shared living also varies significantly between student homes. Residents of the CA evaluate their experiences of shared living as more meaningful. This supports the basic proposition that living according to sufficiency principles does not have to be detrimental to well-being but can promote flourishing and well-being (Hook et al., 2023; Hunecke, 2022; Kasser, 2017). In contrast to our prediction, there was no observable increase in the meaningfulness of shared living for residents of the CA over time. A possible explanation for this lack of effect might be that the applied study design was not able to detect changes in the meaningfulness of shared living, which could have occurred prior to the study. Since the CA was completed only recently, the average time spent living in the student residence was shorter than in the standard student home (see Table 1).

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However, this initial period may have already caused changes in the experienced meaningfulness of shared living, which then stabilised subsequently. It is also important to note that CA residents report high levels of meaning already during the first measurement. Thus it may be difficult to detect an increase in meaningfulness of shared living due to a potential ceiling effect (Wang et al., 2008). Another possibility is that self-selection of participants accounts for the between-subjects effect, irrespective of setting-related influences. Self-selection bias is a common issue in field studies (Shadish et al., 2002) and could not be fully addressed in the current study design. However, exploratory analyses point towards a lagged effect of experiences on the meaningfulness of shared living. This supports the theoretical assumption that in-person experiences of sufficiency-oriented living can strengthen meaningfulness over time. As these experiences are much more prevalent in the CA, sufficiency settings may indeed influence the symbolic meanings of shared living.

Unlike other forms of co-housing, the CA is a student home inhabited by younger residents during their early career stages. It may therefore hold great potential to contribute to the social diffusion of sufficiency-oriented lifestyles (Hunecke, 2022). To address this, we examined differences in sufficiency attitudes and future shared living intentions between settings and over time. Residents of the CA reported more positive sufficiency attitudes than those in the standard student home. However, there was no interaction effect of increased sufficiency attitudes over time in the CA residence. Conversely, we found that sufficiency attitudes increased over time for residents in the standard student home, although the size of the effect was negligible. One reason for this could be that participation in the study had an intervention effect on the sufficiency attitudes of residents in the standard student home. In contrast to the CA, sufficiency might not have been explicitly addressed in their daily context. Thus, completing the survey may have prompted reflection. However, the absence of this interaction effect in the other investigated dependent variables does not support this argument. As predicted, intentions to choose shared forms of living in the future are more frequently reported by residents of the CA. Thus, residents also seem to regard self-organised shared living as worthwhile for later life stages. Although decisions regarding housing arrangements are heavily influenced by contextual factors, housing aspirations can be considered a critical element in realising sufficiency-oriented living concepts (McArthur & Stratford, 2021). Therefore, meaningful experiences from sufficiency settings may challenge the aspirations for suburban single-family homes with gardens, which still dominate living aspirations in Germany (Interhyp, 2019). At the same time policies are needed to upscale innovative projects such as the CA so that more people can enter sufficiency settings. In the context of shared living, this means providing resources to support communities and individuals in realising shared living projects through public policies and the involvement of various stakeholders (Lorek & Spangenberg, 2019).

To account for individual influences in processes of meaning construction, we tested the interaction effects of personal reflection and emotional insight on the relationship between experiences of shared living and meaningfulness of shared living. Neither variable exhibited the hypothesised moderation effect. Since we did not achieve the aspired sample size, this may be due to a lack of statistical power. Another possible reason for this absence of effect could be that the experience of

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shared living is not always addressed through conscious reflection. Generally, meaning construction involves both unconscious and conscious processes. Major life incidents are more likely to prompt a conscious review of personal meaning systems (Hüppauff et al., 2022; Park, 2010), whereas meaning-making in daily life is less likely to elicit a similar response (Schnell, 2021, p. 35). However, another explanation may be that other personal characteristics or practices are better suited to explain interindividual differences in meaning-making. For instance, mindfulness, a form of nonjudgmental awareness of the present moment (Kabat-Zinn, 1994), facilitates the construction of meaning (Garland et al., 2015). Therefore, mindfulness may support the creation of meaning for sufficiency-oriented lifestyles (Hunecke, 2022; Hunecke & Richter, 2019).

4.2 Limitations and Future Studies

The current study employed a longitudinal field study design to investigate whether student homes that incorporate elements of co-housing can strengthen individual perspectives of sufficiency in general and shared living specifically by providing different experiences of shared living. This addresses several current research gaps in environmental psychology (Brick et al., 2024). Firstly, there is a general lack of longitudinal designs that investigate wellbeing and lifestyle changes. Secondly, few studies apply theories related to settings and the diffusion of social innovations. Nevertheless, several limitations could be addressed in future studies.

The explorative cross-lagged panel model analysis indicated a lagged effect of setting-related experiences of shared living on the meaningfulness of shared living. Future studies should replicate this effect with a larger sample size to enable the application of more sophisticated CLPM analysis methods (Orth et al., 2021). Furthermore, the current study did not implement a rigorous pre-post design due to several factors. The official move-in date for the CA's first cohort was postponed multiple times due to construction-related issues. Consequently, while planning the study, it was not feasible to rely on an official move-in date of residents. Additionally, the regular fluctuation of residents in both student homes was insufficient to provide a sufficiently large study sample for applying a longitudinal pre-post design. Thus, future studies investigating setting-related effects on behaviour, well-being and attitude should employ a pre-post measurement plan to enhance causal attribution of effects. Also, additional time points should be included for a clearer analysis of temporal dynamics and variability. For example, experience sampling offers high ecological validity through intensive sampling of everyday situations, facilitating the analysis of person-situation interactions (Hofmann & Grigoryan, 2023). This would be an interesting method to investigate the intermediate effects of setting-related experiences on meaning construction processes that determine the presence or absence of meaning in a given situation. Alternatively, mixed-method designs can be implemented to integrate qualitative and quantitative data sources to investigate meaning construction (Jia et al., 2015). In addition to pre-post quantitative analyses, narrative interviews could be used for a detailed description of everyday situations and how they shape perspectives of shared living. In this way, future research can focus on elements within settings that are particularly important for creating meaningful experiences. Regarding sufficiency, this may include the structures and organisational elements that foster solidarity and a sense of community in relation to living and sharing (Hunecke, 2022, p.

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116). Furthermore, place identity, which describes the incorporation of places into personal identity construction, may be a crucial concept that can explain meaningfulness in the context of settings (Peng et al., 2020; Ujang & Zakariya, 2015).

4.3 Conclusion

There is clear evidence that demand-side mitigation is necessary to solve the climate crisis and counteract the transgression of planetary boundaries (Creutzig, Niamir, et al., 2022). Sufficiency, as a sustainability strategy, offers specific concepts for realising demand-side mitigation. However, despite its potential, sufficiency remains unpopular in public discourse and many people are reluctant when confronted with the idea of downsizing one's lifestyle (Riefler et al., 2024). Investigating the CA as a student residence in which shared living is self-organised based on sufficiency as a guiding principle provided insights into how settings can act as carriers of meaningful experiences related to sufficiency. Results indicated that residents in the CA perceive shared living as meaningful, frequently share items and show positive attitudes towards a sufficiency-oriented lifestyle compared to a standard student home. Furthermore, CA residents demonstrated their potential for the social diffusion of shared living concepts by expressing a stronger intention to continue shared living after leaving their student residence. Together, these findings contribute to the broader perspective that achieving sustainability involves not only identifying and implementing technological solutions, but also means to renegotiate questions of well-being, justice and social cooperation (Creutzig, Niamir, et al., 2022; Lage, 2022). For this reason, it is necessary to design adequate frameworks that make sufficiency-oriented living easier and imaginable (Schneidewind & Zahrnt, 2014). To create settings like the CA where sufficiency can be experienced, practiced and learned offers the potential that more people find meaning in living a life with reduced consumption. In the future more student homes should adapt elements of co-housing to explicitly support sufficiency-oriented living and learning during this critical life-stage. This approach will help us to move closer towards a sustainable future and a utopia that ensures a good life for all.

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5 Open science statement

Hypotheses, method and analysis of this study were preregistered. The complete preregistration can be found at https://osf.io/w9dxf. Data, analysis scripts and questionnaires can be found in the corresponding OSF project https://osf.io/wjaez/. This includes a deviation report where we list all changes that have been made compared to the preregistration. The original questionnaire also includes measures that are not part of the reported analyses. As reported at the beginning of section 2.3 this includes resident satisfaction, personal ecological norm and an open question format that asked for learnings from living in a student home. Consequently, we confirm that our paper includes all studies that we have conducted on this research question and that, for all studies reported, we have reported all measures, conditions and data exclusions, as well as the rationale behind our sample size.

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