

# Crowding and aggression during the COVID-19 lockdown in the United Kingdom: The relationship between residential density, subjective crowding, privacy, and aggression

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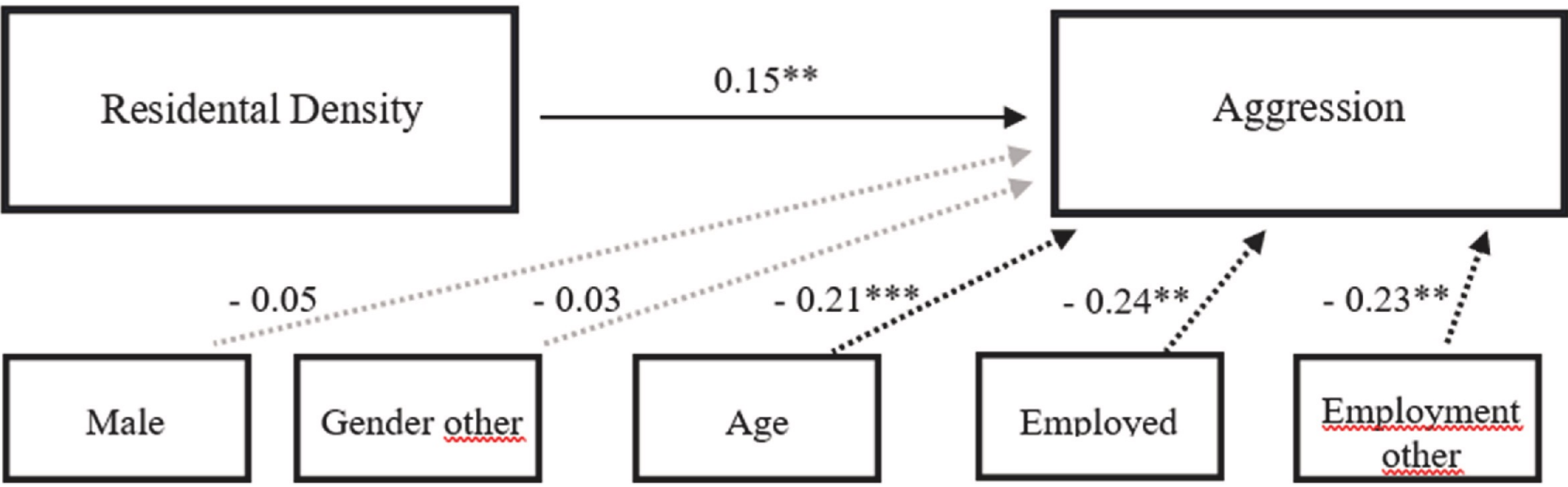
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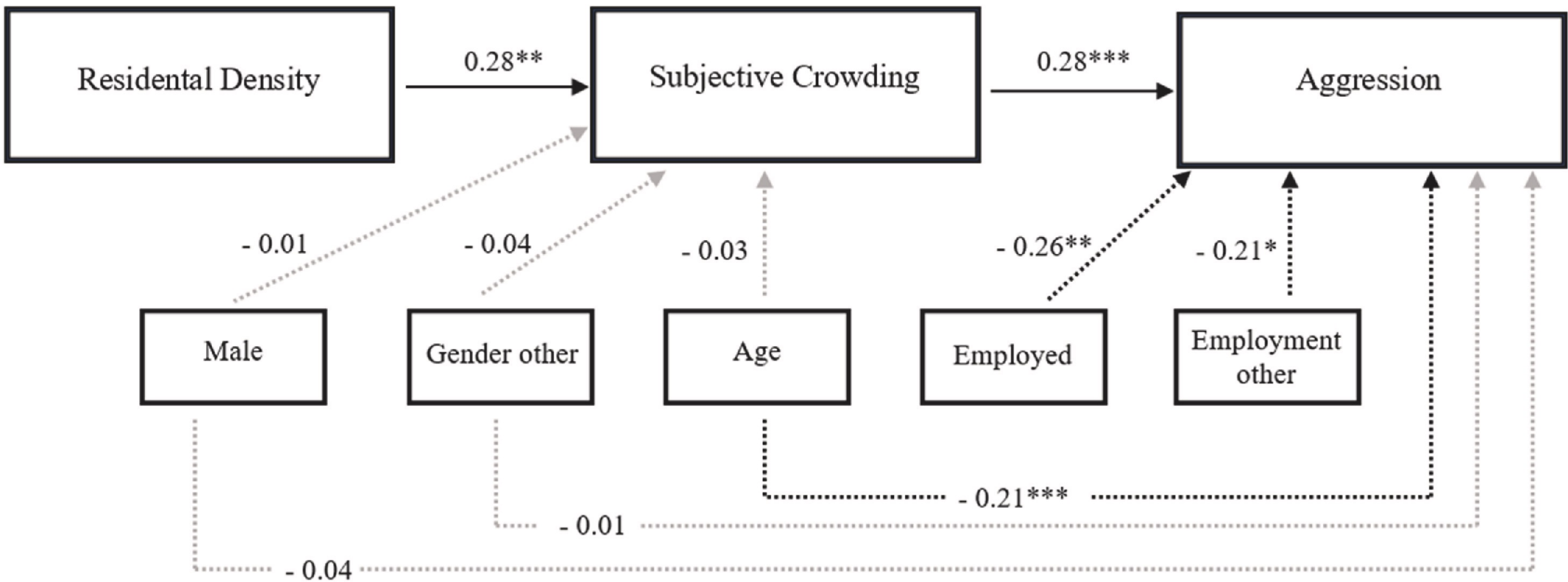
We examined the direct and indirect relationships between residential density, subjective crowding, and perceived privacy, and their effects on aggression in a residential housing context during the COVID-19 lockdown period in the UK, using three hierarchical path models.

## WE FOUND

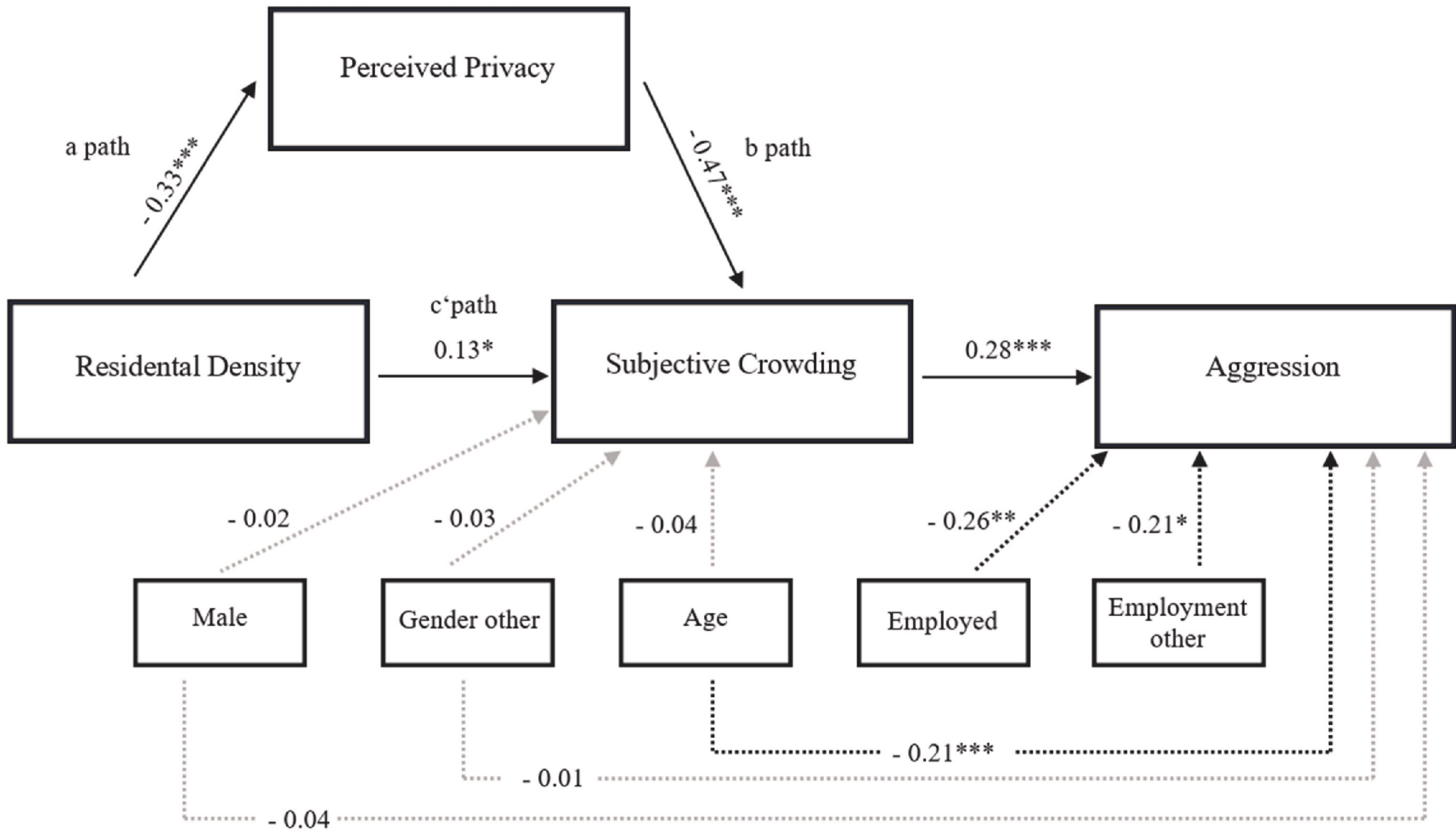
1. Higher residential density correlates with increased levels of self-reported aggression.



2. Subjective crowding has a stronger impact on aggression than residential density alone.



3. Privacy plays a critical role in how residential density leads to feelings of crowding, which then leads to aggression.



### Study Variables

**Residential density** or 'objective home crowding' (Fornara et al., 2022) measured using the American Crowding Index (ACI) (Baker et al., 2013) dividing number of dwellers or persons at home by number of separate rooms. Scores of 1.5 and larger reflect severe crowding (WHO, 2018)

**Subjective crowding** was measured using a single item based on Marshall (1972) and Bordas-Astudillo et al. (2003). The item 'it feels crowded' was rated on a five-point Likert scale ranging from (1) Strongly disagree to (5) Strongly agree and was part of various statements about the house/flat participants had stayed in during the past two weeks.

**Perceived privacy:** Simplified version of Marshall's (1972) assessment of 'environmental privacy composites' and Pedersen's PQ scale (1979) with 5 items reflecting reserve, solitude, intimacy with friends, intimacy with family on a 5-point Likert scale ranging from (1) Strongly disagree to (5) Strongly agree ( $\alpha = 0.75$ ).

**Self-reported aggression:** Brief Aggression Questionnaire (BAQ) by Webster et al. (2015) using 12 items across four dimensions of physical aggression, verbal aggression, anger and hostility on a five-point Likert scale ranging from (1) Very unlike me to (5) Very like me ( $\alpha = 0.84$ ).

**Demographic data:** Age, Gender, Employment and teleworking, Number of children aged under and over 15 years being present, Caretaking and home-schooling responsibilities, any temporary housing arrangements, total number of occupants, type of co-dwellers friends, number of rooms and bedrooms, available outdoor access.

### Study design and Sample

**Online cross-sectional survey** hosted on Qualtrics with opportunistic sample recruited through Prolific. Started June 23 2020 (end of the first Covid-19 lockdown in the UK) Incentive of £10.27 per hour

**N = 299**  
**Residents of the UK, Aged 18+, living with others**  
Average Age: 31.81 (SD = 12.19, range 18–83 years)  
Females n = 205  
Caring responsibilities n = 176  
Home-schooling n = 68  
One to four children under the age of 15 years were present at home n = 111  
One to five children over the age 15 years n = 54  
Employed n = 162  
Teleworking from home n = 144  
Lived in own home n = 283  
Median number of people present at home 3 (range 1–8)  
Median number of total rooms 6 (range 1–14) of which 3 were bedrooms (range 0–7)  
ACI was low 0.64 (SD = 0.35, range 0.01–2.00)  
Majority had an outdoor access n = 258  
Left home once a day and every other day (M = 2.82, SD = 1.23)

### Analysis

SPSS version 28 (IBM Corp., 2013) to compute Pearson correlations where both variables were continuous and point-biserial correlations between a dichotomous and continuous variable

SPSS AMOS version 28 (IBM Corp., 2013) to compute the path models and indirect effects using 5000 bootstrap estimates and 95% bias-corrected confidence intervals for the observed indirect effects.

Age (continuous), gender (categorical), and employment (categorical) were entered as control variables. gender and employment were covaried.

Bonferroni corrections to adjust p-values for multiple testing was not applied given latest recommendations (Armstrong, 2014; Nakagawa, 2004; Perneger, 1998). For hypothesis testing, we examined three hierarchical models.

The first model (H1) assessed the direct relationship between residential density and aggression. The second model (H2, H3) explored the direct, sequential relationships among residential density, subjective crowding,

### Implications

- Our findings show the importance of prioritizing floor plan quality and privacy regulation over merely increasing living space.
- Thoughtful spatial configurations that offer privacy can significantly reduce feelings of crowding and aggression, enhancing mental health and well-being.

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