

# Uncovering Housing Discrimination:

## Cautionary Tales from a Large-Scale Field Experiment via Immoscout24

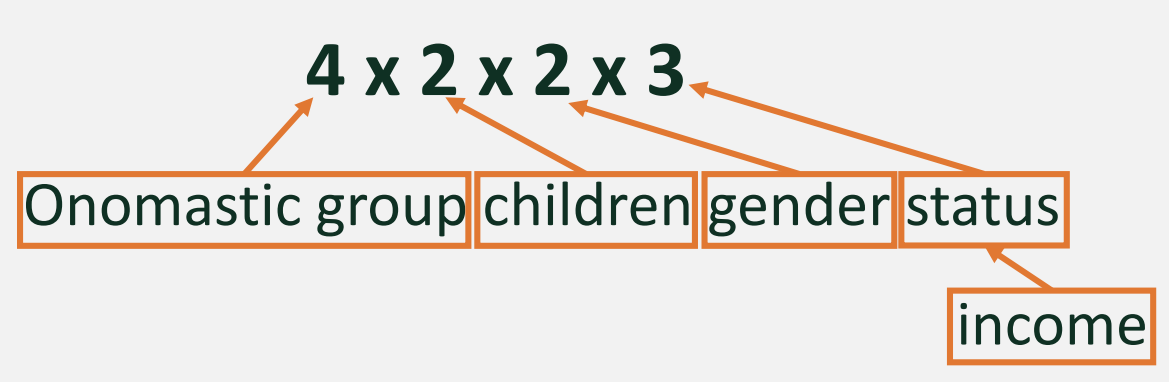
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### OBJECTIVE

To analyze discrimination in the online housing market by conducting a large-scale field experiment on ImmoScout24, comparing landlords' reactions to housing applications differing in applicant names, genders, and socio-economic profiles.

### 1 EXPERIMENTAL DESIGN

- Hierarchical (nested) factorial design with four main factors:



- Onomastic group:** Middle East and North Africa, Southeast Asia, Sub-Sahara Africa, German
- Children in household:** yes, no
- Gender of applicant:** male, female
- Social class operationalized by occupational status:** low, medium, high

Example inquiry message:

Sehr geehrte Frau VERMIETERIN,

wir, meine Frau und ich, haben großes Interesse an der von Ihnen angebotenen Wohnung und würden uns sehr freuen, zu einem Besichtigungstermin eingeladen zu werden.

Wir haben keine Kinder, rauchen nicht und haben keine Haustiere. Ich arbeite als Architekt, während meine Frau als Physiotherapeutin tätig ist. Unser gemeinsames monatliches Einkommen beträgt ca. 4.600 € netto.(...)

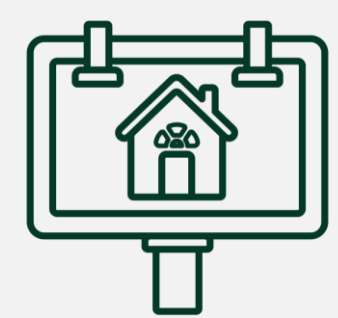
Mit freundlichen Grüßen,

Bilal und Samira Ahmad

**Ethic Approval:**  
 A detailed ethics concept was developed to protect both landlords and applicant groups. Sufficient lead time was required to align with ethics committee review schedules and ensure responsible study conduct.

### 2 SELECTION OF HOUSING LISTINGS

- Regions:** 1 of 100 → 1 of 10 selected regions
- Rent Price:** €1,000-2,300
- Size:** At least 45 m<sup>2</sup>, 2-6 rooms
- Rental Type:** Monthly rent
- Exclusion Criteria:** Swap flats, new construction projects
- Page Sorting:** Most recent first



**Sample Limitations:**  
 In competitive markets like Berlin, premium accounts are often essential. For cost and convenience, we only send unregistered inquiries without an account.

Example URL:

```
www.immobilienscout24.de/Suche/de/bayern/muenchen/wohnung-mieten?numberofrooms=2.0-6.0&price=1000.0-2300.0&livingspace=45.0-&exclusioncriteria=projectlisting,swapflat&pricetype=rentpermonth&sorting=2
```

**Automation: flathunter<sup>1</sup> (GitHub-Repository)**  
 After an initial period during which automated collection of housing listings functioned effectively with the help of 2Captcha<sup>2</sup> to bypass captcha protection, ImmoScout24's bot detection system was modified, making the use of 2Captcha and thus our automated approach obsolete.

**Supplemented with manual implementation**  
 For over six weeks, the project team, manually selected housing advertisements and sent application requests.

### 3 EMAIL RESPONSES

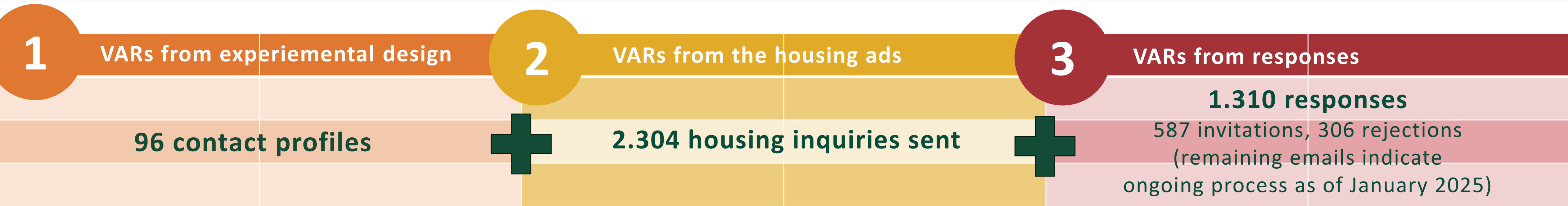
- Emails sent and received via a custom DeZIM domain (**mail-inbox.online**)
- Automated dispatch of emails through the **Mailgun<sup>3</sup> API**
- Incoming email responses manually categorized
- Additional variables created from responses:
  - Automated Replies:** Yes/No
  - Request for Additional information:** Yes/No
  - Invitation for Viewing:** Yes / Possible / No
- Automation of Response Processing:** The script loads a outlook-export.CSV file containing the email responses and identifies the previously assigned email category based on the sender and subject.



**Caution:**  
 Avoid being classified as a bot by limiting the rate of automatic email replies!

### DATA SET

These three data sources ultimately result in a structured data set that provides initial insights.



Scan  
to view online

**References**  
<sup>1</sup>flathunters. (n.d.). flathunter [GitHub repository]. GitHub. <https://github.com/flathunters/flathunter>  
<sup>2</sup>Captcha. (n.d.). 2Captcha: Human-powered CAPTCHA solving service. <https://2captcha.com>  
<sup>3</sup>Mailgun Technologies. (n.d.). Mailgun. <https://www.mailgun.com>