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Diversity and Interethnic Marriage

An Agent-Based Modelling Approach

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Why study inter-ethnic marriage?

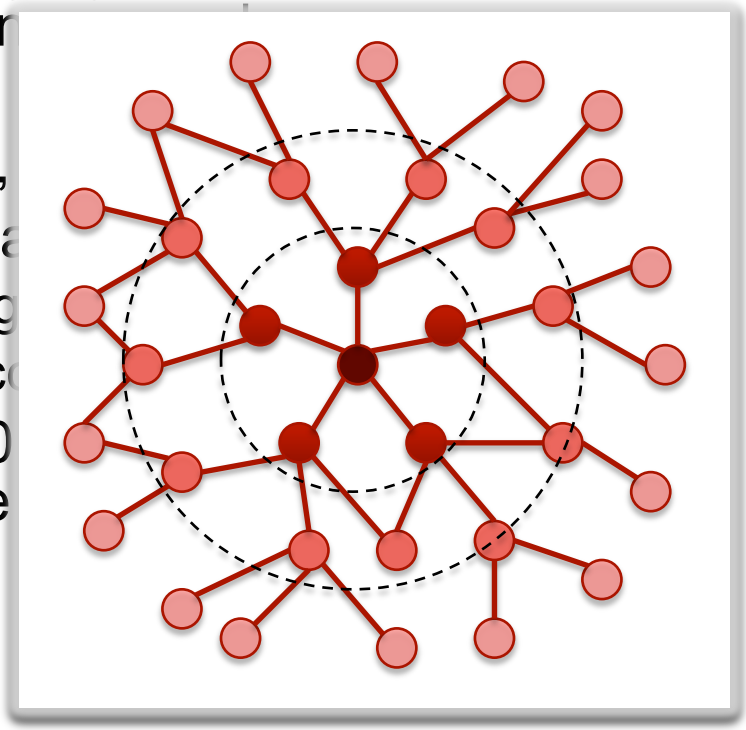
- IEM seen as a gauge for immigrant/minority integration
  - Presence of inter-ethnic partnerships in society as sign of low social distance between groups and high levels of social cohesion
  - Involves trade-off between some aspects of assortative mating, namely socio-economic status and ethnicity (Dribe & Lundh 2008, 2011)
- Partner selection: decision to partner inside/outside one's group stems from
  - Individual preferences
  - Opportunity for contact
  - Group-specific norms
- Lends itself easily to agent-based modelling
  - Tool to explore theories and impact of various interacting behaviours/processes

Our Approach

- DITCH model ("Diversity and Inter-ethnic marriage: Trust, Culture and Homophily")
- Start with a simple model, easily extendible in the future
- Include only necessary processes / data
  - Partner Search / Dating / Matching
  - Social networks
    - Homophilic (ethnicity, age) → Schelling (sort of)
    - Random
- Include up to four different ethnicities
  - Represented abstractly (w, x, y, z)
  - Proportions can be specified as model parameters
- Basic model version: static population
  - cohort of 18-35 year olds
  - Single at model initialisation
  - Inspired by existing models of (inter-ethnic) partnership formation (Todd, Bilari et al., Walker/Davis)
- First extension: dynamic population
  - integrate migration

Description of Basic DITCH Model

- Simulation of the partnership formation behaviour of single agents
  - Characteristics: sex, age, ethnicity, education, compatibility
  - Preferences for partner based on characteristics above
- Dynamic social networks (with strong age and ethnic homophily) created to help with partn
  - Search within the 'love radar'
- Partner selection: Searching, dating,
- Different diversity scenarios in local a
  - Classified according to ethnic homog
  - 4 largest ethnic groups taken into ac
- Simulation runs: 10-year period (200
  10 replications for each level of 'love



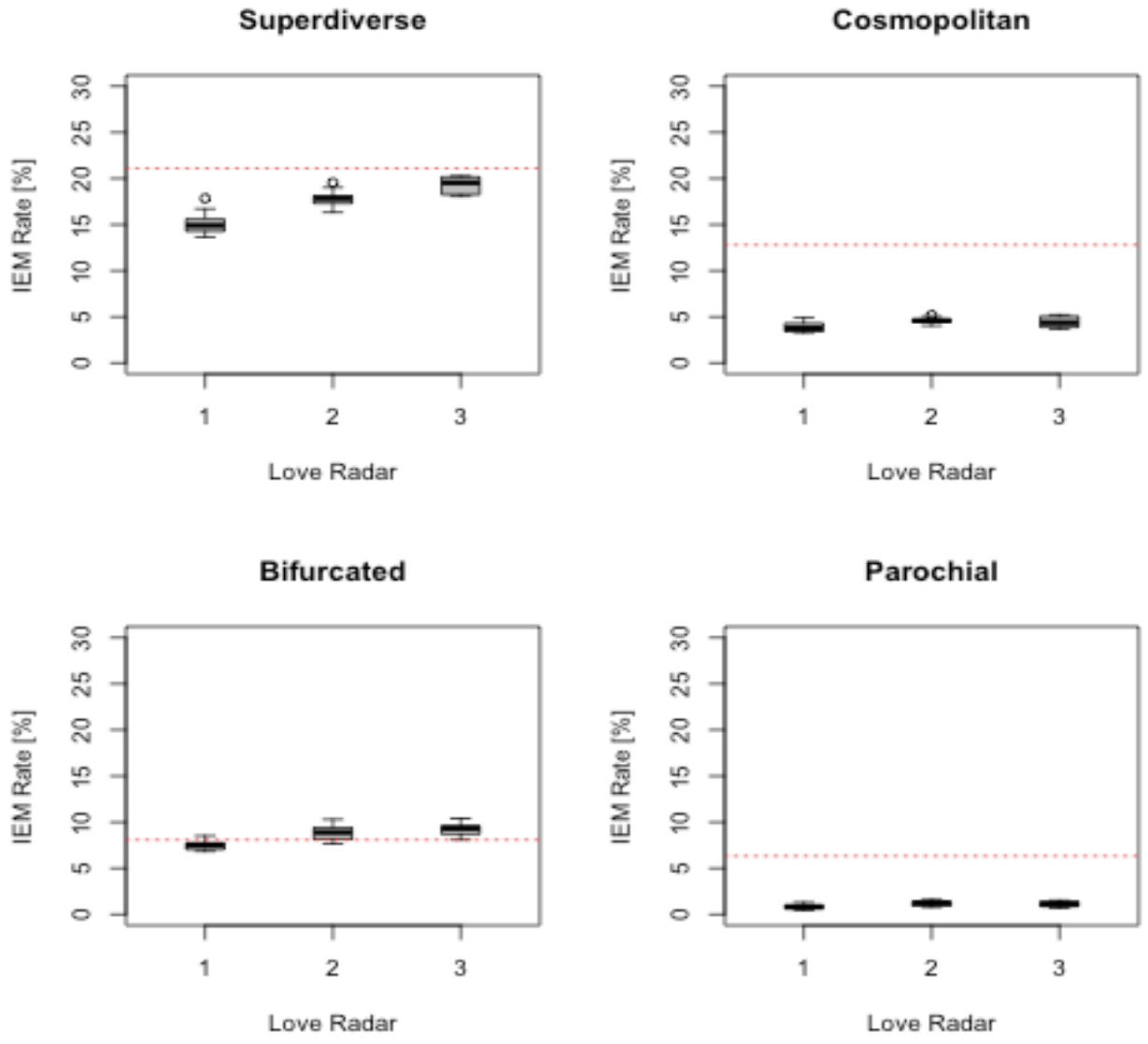
Scenarios: Archetypal UK areas

- Model runs are based on four archetypal UK areas:
  - Cosmopolitan (Trafford, Greater Manchester)
    - Large number of ethnic groups of relatively small size, majority White: British population
  - Bifurcated (Bradford, West Yorkshire)
    - One large minority group (British Pakistanis) and large White: British population
  - Super-diverse (Newham, Greater London)
    - Many different ethnic groups, minority White: British population
  - Parochial (Chester & West Cheshire)
    - Very few ethnic groups, substantial White: British population (c. 98%)
- Note: models scenarios are run with the largest four ethnic groups only; therefore there are weighting effects in model findings

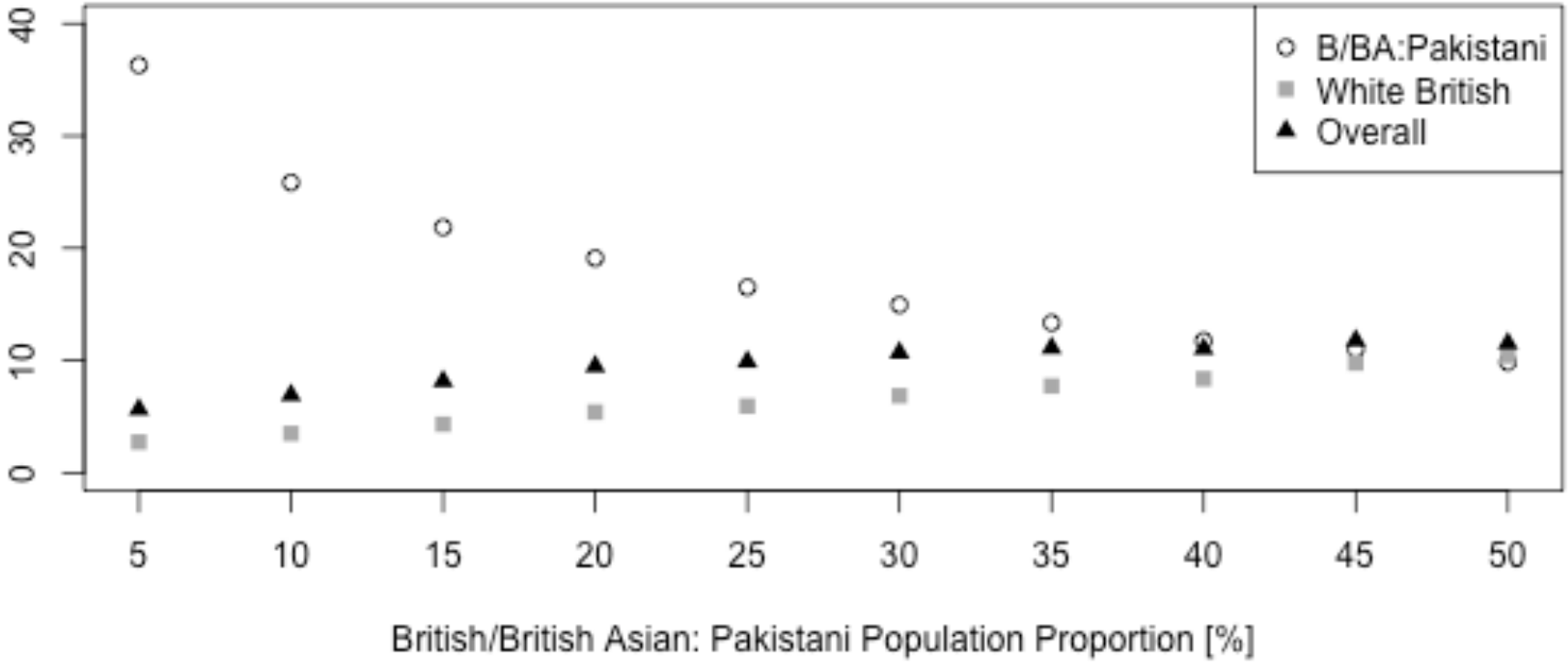
Findings from basic model

- Investigating effects of social network (homophilic vs. random), opportunity for contact (love radar) and group size
- Diversity (especially in areas with low ethnic homogeneity) fosters higher rates of inter-ethnic marriage
- Rates can be mediated by group size, the type of network, and the extent of the search range
  - The larger the group, the lower the number of IEMs
  - Homophilic networks increase the number of marriages overall, but decrease the number of inter-ethnic marriages
  - Increasing the opportunity for contact increases the IEM rate

Effect of Love Radar (Basic Model)



Effect of group size

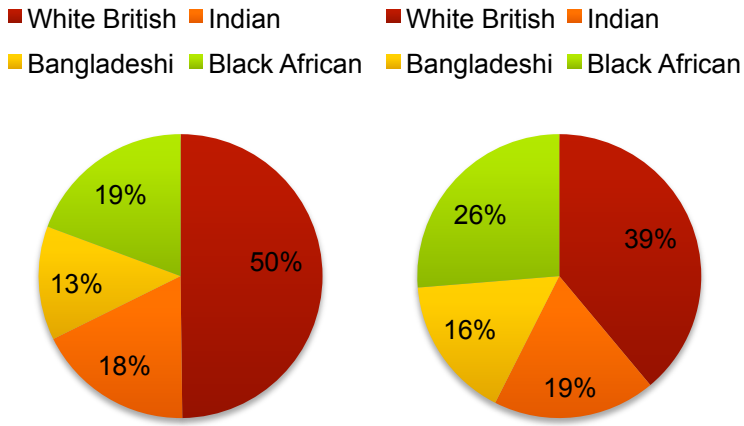


First extension: Adding migration

- Main driver of increased ethnic diversity and opportunities for inter-ethnic contact and partnership formation in the UK
  - On LAD level: International and internal migration
- Changes population size and composition
  - Increasing / decreasing opportunities for contact

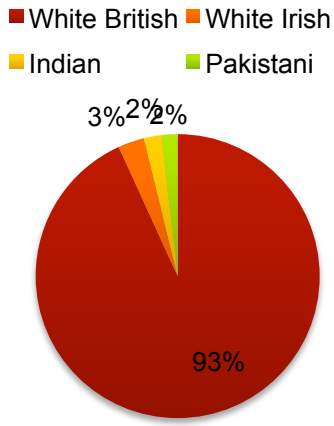
Population Proportions

Newham 2001

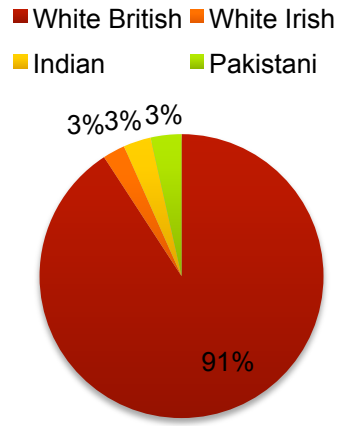


Newham 2011

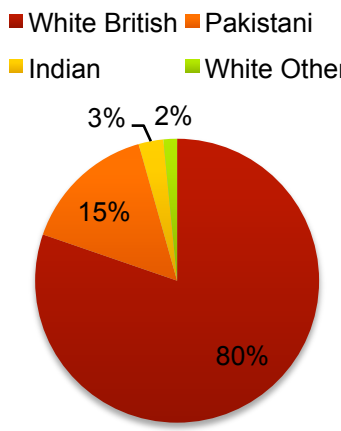
Trafford 2001



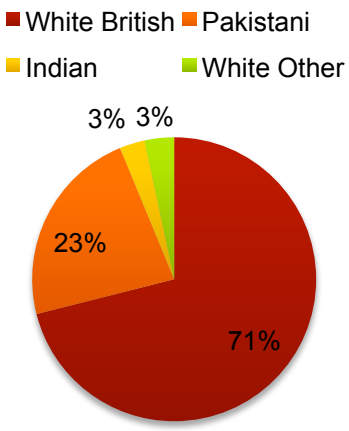
Trafford 2011



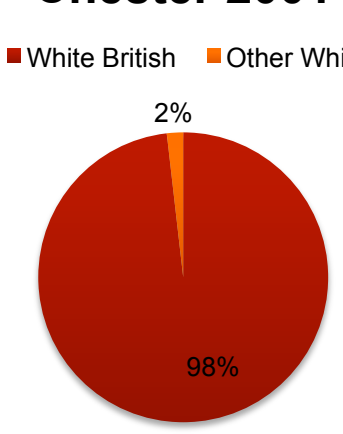
Bradford 2001



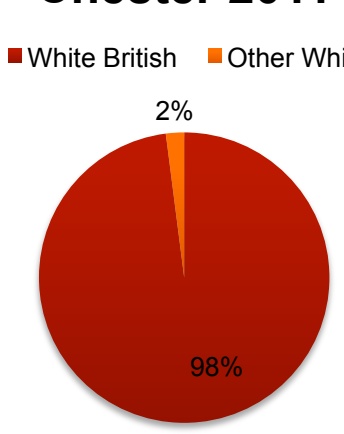
Bradford 2011



Chester 2001



Chester 2011

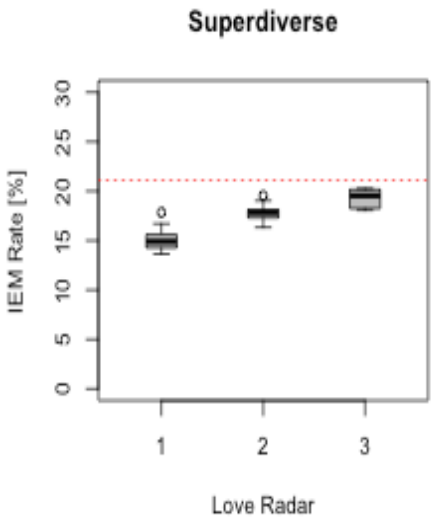


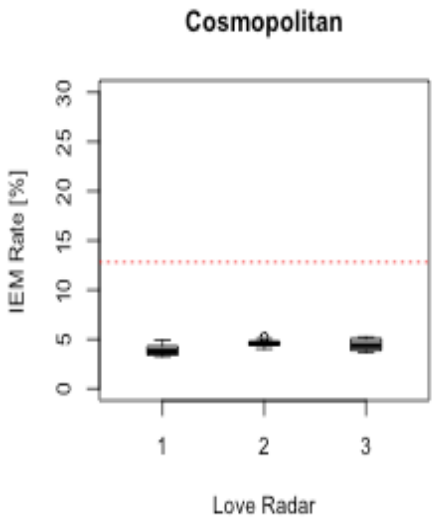
Model Extension: Migration

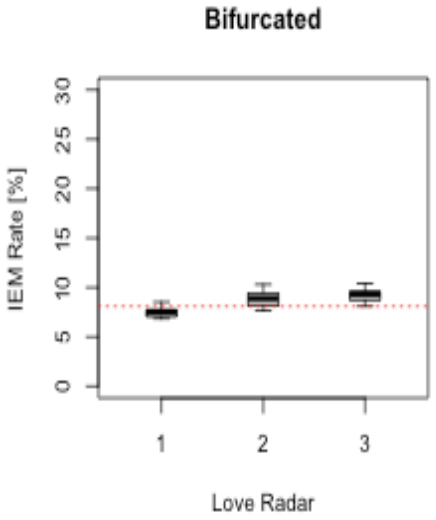
- Inflows and outflows on the level of LADs for each ethnic group based on UK Census 2001 data
  - Available from Office for National Statistics
  - Combined internal and international migration
  - Migration rates given as proportion of ethnic group per year
- Used to calculate number of immigrants (new agents) and emigrants (old agents leaving the model) per ethnic group at beginning of a year
  - Spread over the year randomly
  - Ensure that married couples leave together
  - Immigrants are initialised like agents created at beginning of simulation
  - Disturbance of social network (emigrants delete all links)

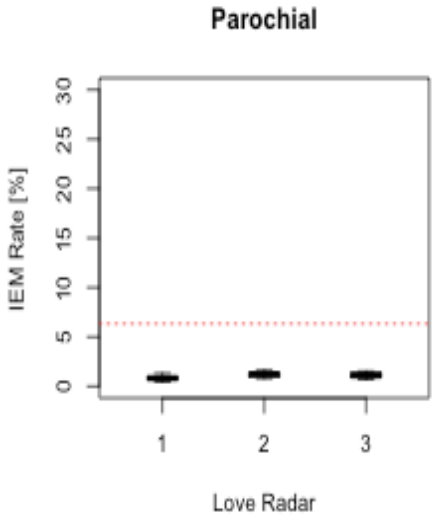
Preliminary Results

Basic Model

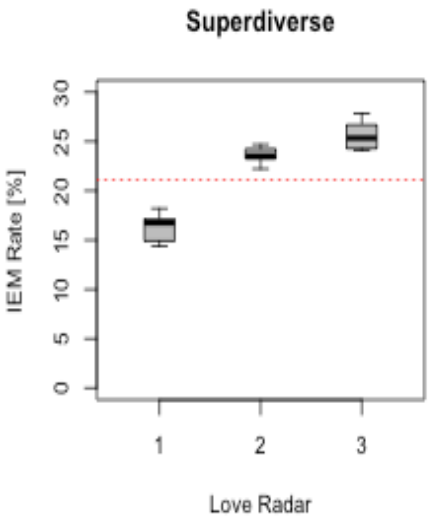


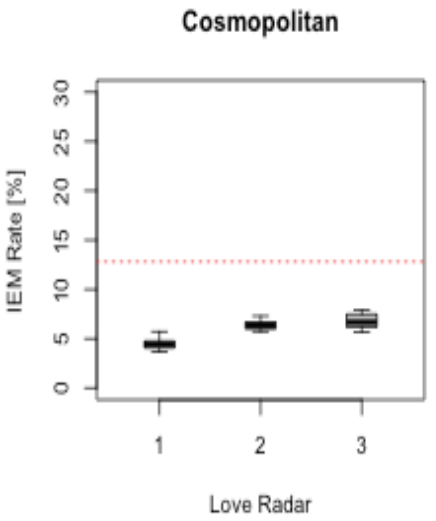


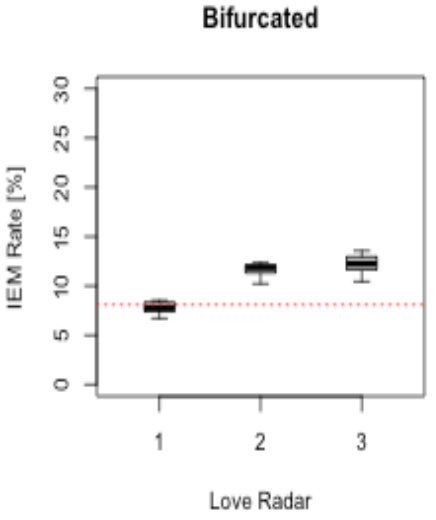


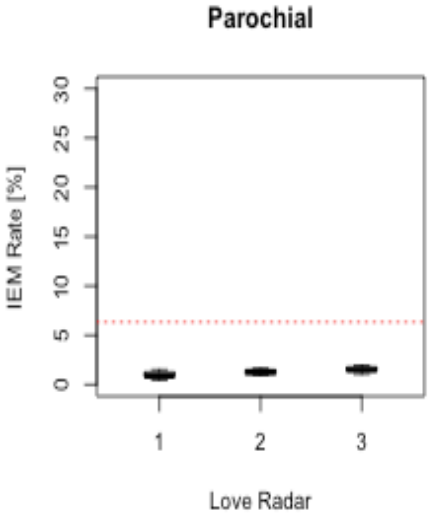


Extended Model







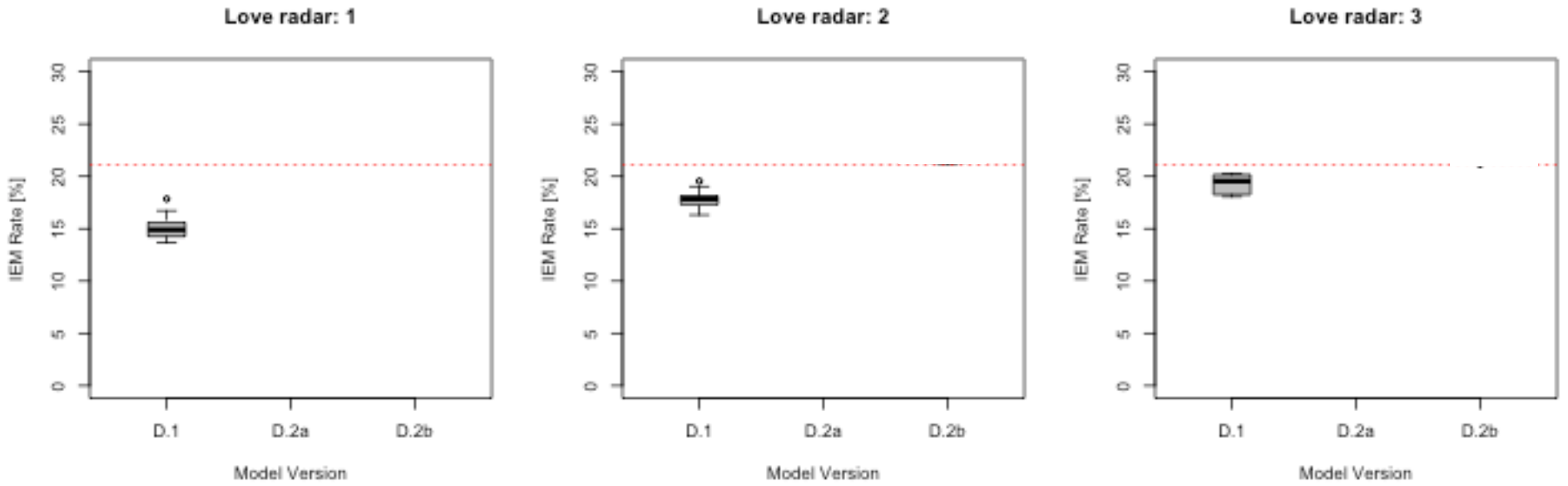


Findings from extended model

- Migration can be important to incorporate
  - Marked influence in scenarios with low(er) proportion of White British
    - declining majority group
    - increasing overall population
- Data situation is not ideal
  - Available empirical data on LAD level
    - Inflow/outflow rates derived from Census 2001
    - Inflow/outflow rates derived from Census 2011
  - Problems
    - Definition of some LADs has changed
    - Different ethnic categories
    - Applying static rates does not result in realistic population
- Solution: use net rates interpolated from Census 2001 and Census 2011 population data
  - Varying rates per year result in correct population composition
  - Net rates means fewer exchanges of agents (less disturbance of social network)
  - Problem: Not applicable to LADs whose definition has changed from 2001 to 2011
    - Example: Chester (Scenario Parochial)

Effect of Migration Rates on Inter-ethnic Marriage Rate

- Example Newham (Superdiverse)



Conclusion and Outlook

- Basic model version clearly not yet complete
  - Captures overall level of inter-ethnic marriage
    - But does not capture IEM rates of particular groups (British South Asians)
  - Captures differences between areas
    - But does not yet include changes in population within an area
- Extended model version (dynamic population due to migration)
  - Improved fit, particularly for more diverse areas
- Next step: Preference trade-offs
  - Test theoretical arguments about trade-offs that are deemed to exist between ethnicity and education
    - E.g. Exchange theory; Opportunity structures; Assortative mating
  - Look at inter-marriage partnerships in various scenarios of preference (low in-group, high in-group, high majority, random)