How to regulate school choice? Insights from research and practice

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Introduction

Mandate for presentation:

- Lessons from abroad and best practices
- Recommendations to better align the objectives of the decree with the respect for preferences

Presentation today will draw on (sometimes very recent) research on school choice (very active area in economics and computer science) and practices documented on the website www.matching-in-practice.eu

Introduction (cont'd)

Context for school choice across the world

- Large differences in the extent to which preferences are taken into account
- Trends in systems with traditionally no choice to increasingly account for parental preferences
- Belgium is at the other extreme: long tradition of (unregulated) choice
  - Regulation of choice introduced for equity reasons
- Different starting points affect what is political feasible

Introduction (cont'd)

Enrollment procedures are no magic bullet

- Supply (schools) and demand side (parents) to the problem
- Enrollment procedures take demand as given
- In systems where preferences take precedence, procedure does not affect allocation unless there is excess demand

Congestion versus saturation

- Congestion refers to a situation when preferences are polarized and a few schools attract the bulk of applications. Congestion can happen even if there are a sufficient number of seats
- A system is saturated when the number of children is close to or larger than the number of seats available.

Agenda

- **Basic concepts -- the bulk of the talk**
  - Elements of an enrollment procedure
  - Desirable properties and an impossibility result
  - The case for strategically simple procedures
  - Diversity objectives
  - Direct vs. indirect effects
- **Evaluation of current legal framework**
  - Priorities
  - Algorithms and tie-breaking
  - Local tailoring and coordination across schools
  - Brussels
- **Additional comments**
  - The right to a school
  - User friendliness, helping parents make effective choices

BASIC CONCEPTS

Elements of an enrollment procedure
Desirable properties and an impossibility result
The case for strategically simple procedures
Diversity objectives
Direct vs. indirect effects

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Elements of an enrollment procedure

- An enrollment procedure is a procedure designed to organize the match between of pupils to schools
- All enrollment procedures contain three distinct elements:
  - A set of rules for participating and expressing preferences over schools;
  - Criteria and rules to determine which child has priority over another one, at each school; Translation of political objectives
  - An algorithm that determines on the basis of the preferences submitted as well as the priorities, which child goes where.

Rules for participation and expressing preferences

- The way in which parents can apply has first order effects on participation and ability of procedure to satisfy demand
- **Participation**: automatic versus voluntary, timing, …
- **Ability to express preferences: the more the better**
  - Estonia: can list three acceptable schools, no ranking
  - Most countries: can rank a limited number of schools
  - Hungary: no constraint

  Constraints on preferences introduce need to strategize
- **Information and decision support**
  - Parents take info available into account
  - Available information ↔ usable information
  - Low income families disproportionally benefit from tailored information

Political objectives, priorities, criteria and tie-breaking

- If there is only one seat left and two children who would like to attend the school, which one should you choose? = a political question
- **Absolute priorities versus conditional priorities**
  - Absolute priority: no matter who else has been accepted so far (example: siblings)
  - Conditional priorities: depends on set of accepted students (example: diversity objectives)
    - Social, academic or ethnic diversity quotas
- **Hierarchies of priorities when multiple and conflicting objectives**

Political objectives, priorities, criteria and tie-breaking (cont'd)

- **Criteria to decide who benefits from a priority**
  - Ideally automatic (not based on self-reporting) and verifiable
  - Aligned with objective of priority (ideally based on personal characteristics of child)
- **Political objectives often result in groups of children with priority over another group but not in a full ranking of children**
  - Need for a tie-breaking rule
  - Tie-breaking rules do not have the same status as priorities because they are not meant to reflect a political objective

Algorithms

- Once preferences, priorities and school capacities are given, there are still many ways to match children to schools

Example: 3 schools (A, B, C) with one seat, 3 children (Laura, Romane and Theo)

Priorities (incl. tie-breaking):

School A	School B	School C
Laura (sibling)	Romane	Laura
Romane	Theo	Romane
Theo	Laura	Theo

Preferences

Laura	Romane	Theo
School A (sibling)	School A	School B
School B	School B	School A
School C	School C	School C

First-preferences-first algorithm

1. Parents submit their preferences (rank order list)
2. Applications are submitted to school of first choice; accepted according to priorities and capacity
3. Rejected applications in previous step are submitted to second choice school; accepted according to priorities and capacity
4. … etc

School A	School B	School C
Laura	Romane	Laura
Romane	Theo	Romane
Theo	Laura	Theo

Laura	Romane	Theo
School A	School A	School B
School B	School B	School A
School C	School C	School C

If Romane's parents understand the procedure, they'd better say that school B is their true choice (and Romane will be B)

First-preferences-first algorithm (cont'd)

- Maximization of first choices, then second choices … seems to be a good idea (« one respects preferences more »)
  - Problem is that submitted preferences are not the true preferences !
- Parents are not all equally able to strategize
  - Abdulkadiroglu et al, 2006 (Boston): greater proportion of African-American among those parents making « big strategic mistakes »
  - Calsamiglia et Güell, 2014 (Barcelona): Parents indicate as first choice school where they have priority … unless they can afford an outside option
  - Pathak-Sönmez, 2008: non strategic parents lose out

School-proposing deferred acceptance algorithm

1. Parents submit their preferences (rank order list)
2. Schools offer a seat to highest priority students up to capacity; students **temporarily** accept preferred school among offers received
3. Schools with remaing capacity, offer seats to next batch of priority students up to capacity, students **new offers and the offer temporarily accepted so far** and keep best one
4. … etc

School A	School B	School C
Laura	Romane	Laura
Romane	Theo	Romane
Theo	Laura	Theo

Laura	Romane	Theo
School A	School A	School B
School B	School B	School A
School C	School C	School C

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Desirable properties

- **Respect for preferences** means that we should not have a situation where, at the end of the procedure, two (or more) students would be better off exchanging their seats at the schools they were assigned to.
- **Strategic simplicity** means that it should be simple for parents to figure out what preferences to submit and, in particular, submitting their true preferences should be the best strategy.
- **Respect for priorities** means that we should not have a situation at the end of the procedure where a child is not accepted at a school he prefers even though another child, who benefits from a lower priority, is accepted.

An impossibility result

Abdulkadiroglu-Sönmez (2003): There is no algorithm that always respects preferences, respects priorities and is strategically simple

➔ We have to choose (a political decision again)

- The **student-proposing deferred acceptance algorithm** is the algorithm that best respect preferences among those that respect priorities and are strategically simple
- The **Top-Trading Cycle algorithm** respects preferences and is strategically simple but may not always respect preferences

The student proposing deferred acceptance algorithm

1. Parents submit their preferences (rank order list)
2. Applications are submitted to school of first choice; **temporarily** accepted according to priorities and capacity
3. Rejected applications in previous step are submitted to second choice school; schools compare **new applications and applications temporarily accepted so far** and accept according to priorities and capacity
4. Etc …

The Top Trading Algorithm

1. Parents submit their preferences (rank order list)
2. Each school points to highest priority child among those who applied; every child points to his/her first choice school
   - There is a **cycle** if there exist a sequence of schools and children pointing towards one another such that the las child points to the first school in the cycle
   - Give the seats to the children who belong to a cycle; remove the seats from the schools' capacity; remove the children who got a seat
3. In step 2, each school points to highest priority child among those who applied and are still around; every child points to his/her first choice school among schools with remaining capacity
4. …

Preferences versus priorities

For long, it was thought that tradeoff not important, but recent research by Calsamiglia and Miralles (2014) has shown that in congested and/or saturated systems, respecting priorities can significantly hurt the objective of respecting preferences.

Advantage of respecting preferences (top trading cycle)

- Better meets parents' demand, especially when system is congested and/or saturated
- Currently used in New Orleans

Advantages of respecting priorities (student-proposing deferred acceptance algorithm)

- Legal certainty ? (no priorities set by the law are violated)
- Implementation of political objectives
- Used in Boston, NYC, Chicago, several UK districts

Compromise solution: determine which priorities cannot be violated, those that can if this helps respect preferences

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Strategic complexity

Strategic complexity can arise from four potential sources:

- procedures that do not allow for the full expression of preferences,
- priority criteria that rely on self-reporting,
- algorithms that induce strategic behavior (such as the first-preference-first algorithm)
- tie-breaking rules that depend on the position of the school in the student's reported preferences.

Advantages of strategically simple procedures

1. Easy to provide advice to parents: the best they can do is to report their true preference.
2. Equity: Evidence from Boston and Barcelona shows that not all parents have the same ability to strategize and that there is a social bias in this ability. Moreover theoretical work has shown that parents who are not strategic lose out to parents who are strategic.
3. Data generation: because the preference submissions can be interpreted as parents' true preferences, they can be used to evaluate the adequacy between demand and supply and provide insights to the type and location of schools that are needed.

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Diversity is important everywhere …

- **Two non exclusive channels**: demand and supply
- **Supply (enrollment procedure):** by influencing the allocation of seats to children as a function of their characteristics
  - Many faulty designs (majority quotas, minority quotas, …)
  - Diversity objectives are best met by a system of quotas (one for each group one cares about)
- **Working of double quota system**
  - School seats are divided into GOK seats and non GOK seats according to desired composition
  - GOK students have priority over non GOK students for GOK seats and vice versa
  - Algorithm is adjusted so that GOK student "prefers" the GOK seats of a school to the non GOK seats of the same school, rest is as usual
- Applications and variants: Chicago, Denver, NYC, some cities in the UK (banding)

Diversity (cont'd)

- **Demand channel:** convince parents of disadvantaged backgrounds to attend "white schools" and vice versa
  - Different preferences over quality and distance ?
  - Role of tailored information
  - Insight from behavioral science in other contexts: anchor choices, default choices, …

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Direct versus indirect effects

- Priority criteria can affect residential choices, career or employer choices, educational choices, or schools' pedagogical choices. The degree of satisfaction of parents with their school assignment can impact a student's success and/or the frequency with which s/he is likely to change schools.
- These do not need to be all bad but need to be anticipated and monitored

  Example of top 10% rule for admission in Texas public universities: rule intended to promote ethnic diversity in universities ended up promoting ethnic diversity in high schools, but not in universities.

  Evidence from Sweden and Romania showing that policies that change student composition of schools can increase teacher mobility across schools towards schools with better populations

EVALUATION OF CURRENT LEGAL FRAMEWORK IN FLANDERS

Priorities

Algorithms and tie-breaking

Local tailoring and coordination across schools

Brussels

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Priorities – 3 potential weaknesses

- The double quota system only kicks in after the other 2 (3 in Brussels) priority groups, which effectively means that when these priorities cannot be reconciled with diversity, diversity takes the back seat. Was this the intention?
- The assignment to the GOK on non-GOK categories is largely based on self-reports. Is gaming possible?
- A potential indirect effect of the priority for staff's children is that young teachers with kids avoid "difficult schools". Is there a way to favor staff without hurting schools that are in trouble already?

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Algorithms and tie-breaking

- Currently, a version of the school-proposing deferred algorithm.
- Tie-breaking based on the position of the school in the submitted preferences introduces strategic complexity and should be avoided. Distance is a common tie-breaking rule but its indirect effects need to be monitored and is prone to manipulation.
- **Recommendation**: adopt the student-proposing deferred acceptance algorithm or the top trading cycle algorithm, and for sure avoid tie-breaking on the basis of preferences.

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Local tailoring and coordination

- In the presence of diversity objectives, some local tailoring is needed because the composition of student population varies across school districts.
  - Tailoring also increases buy-in from key actors of system
- The ability to tailor some aspects of the procedure to the local context and the coordination role that LOPs play in this respect in densely populated areas is a strong point of the current decree.
  - Tailoring without coordination leads to all kinds of externalities from choice of individual schools.

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- Three overlapping systems, student movements between them

→ Needs coordination

  - At a minimum common timing and centralized submission process (but not priorities or criteria !)
  - More: manage externalities

Greatest beneficiaries of such coordination would be disadvantaged families

ADDITIONAL COMMENTS

Ensuring the right to a school

User friendliness, helping parents to make effective choices

Ensuring the right to a school

- Right to a school can get the back seat in enrollment procedures that take preferences into account because they are focused on managing excess demand
- Need to say what happens to children who applied but did not get assigned to a seat
  - Notion of **acceptable school**
- **Radical idea:** preassign every student to a school based on distance and other criteria; then organize a top trading cycle among those who would prefer to go to another school.
  - Every child is certain to be assigned to a school
  - Reduce mental costs of applying to a school for those who are content with their assignments

User friendliness, helping parents

- Complexity of the algorithm ↔ complexity of parents' decision problem
- Can further help parents by providing decision support tools and information, advising, open days, …
- **Bad ideas**: procedures that ask parents for one choice at a time, or for a set of unranked acceptable schools

FINAL WORDS

"The debate about admissions, while often appearing to be about arcane technicalities, does in fact go to the heart of current policies about how best to achieve social justice, an improved education system and a cohesive society."

— Coldron report on secondary school admissions in England (Coldron et al., 2008, page 3)

Final words

- It is great that the Education Commission is reflecting on how to improve the current decree and tapping on expertise
- School choice in Flanders is seen as representing a number of best practices: both due to some past good work and more favorable legal and political contexts
- Essential to be clear about the political and the technical dimension of the policy
  - Spend time on clarifying political objectives, …
  - Rely on existing knowledge and research for the technical dimension (implementation)
  - And, why not, have school choice in Flanders become a subject of research by making data available for researchers