Children's Occupational Preferences: Evidence from a Theme Park Behavior Logs

Keywords: children, gender inequality, gender stereotypes, occupational gender segregation, theme parks

Most of the gender wage gap is driven by gender differences in occupation and industry [1] making it important to understand why occupational gender segregation persists. It is partly explained by stereotypes about professional groups and abilities [2]. Acquiring gender stereotypes starts at an early age [3], and then these ideas of gender roles influence children's interests [3], perception of their abilities [4], and job aspirations [5].

Role-play in a counter-stereotypical or neutral environment provides an opportunity to try out different occupational roles which can influence stereotyping [6]. However, it is not yet clear how children would use these opportunities, given that they may already have acquired gender stereotypes that could affect their interests and choices.

We use unique large-scale user-behavior log data from the KidZania theme park in Moscow to study girls' and boys' occupational preferences. KidZania is a child-sized replica of a real city, where children participate in activities that imitate real-world occupations at more than 100 locations, which offer one or several jobs. There are locations that correspond to traditionally male-dominated fields (e.g. a fire station), female-dominated (e.g. a beauty parlor), and neutral locations (e.g. a pizzeria), but children are free to choose whatever location and job they want.

Children wear electronic bracelets that collect detailed anonymized information about their visit (which locations were visited, in which order, and which job a child performed at each location). We use this data on 29 thousand children aged 7-12 years (53% girls), who visited KidZania in 2018, along with information about their gender and age. On average a child attends 6 locations per visit. We choose 42 most popular locations (>1500 visits per location, 94% of all locations' visits) and analyze the proportion of girls among the visitors of each location. We also constructed a bipartite network (child -> location) and then projected it to a location co-visited network (see Fig.1a).

We find that gender preferences are consistent with real-world occupational segregation. Boys-dominated locations are car service, tire fitting, gas stations, highway, oil refinery facility, police station, cash collection, and construction site (40% of girls or less; see Fig.1a), while beauty salon, model agency, perfume lab, vet clinic, acting school, chocolate/juice factories, dentist office, supermarket, animation/TV studios, ambulance, medical lab, and radio station are girls-dominated (60% of girls or more).

We also analyze the choice of a job inside the aviation academy and the clinic, which seem to be gender-neutral locations (45% and 53% of girls respectively), but offer a gender-specific choice of jobs: pilot vs flight attendant; radiologist vs general practitioner vs surgeon (the most male-dominated medical specialty [7]). In the case of the clinic, the results are counter-intuitive: more girls than boys choose the surgeon role (41% vs 30%, chi-squared test, $p < 10^{-4}$). This proportion is stable for children of different ages. In the case of the aviation academy, the differentiation increases with age: the proportion of girls, who choose the role of a pilot over flight attendant, decreases (see Fig.1b); the respective proportion of boys grows. Among the boys, differentiation is stronger (20% choose flight attendant, 80% pilot) than for girls (42% vs 58%). This is consistent with the results that gender biases strengthen throughout primary school and that male stereotypes are more restrictive [8].

We analyze the network of co-visited locations and find the tendency toward segregation of professions into feminine or masculine clusters. However, the tendency to homophily is not very strong. Gender assortativity (a proxy for homophily) for the profession network is 0.2 and increases with the childs' age.

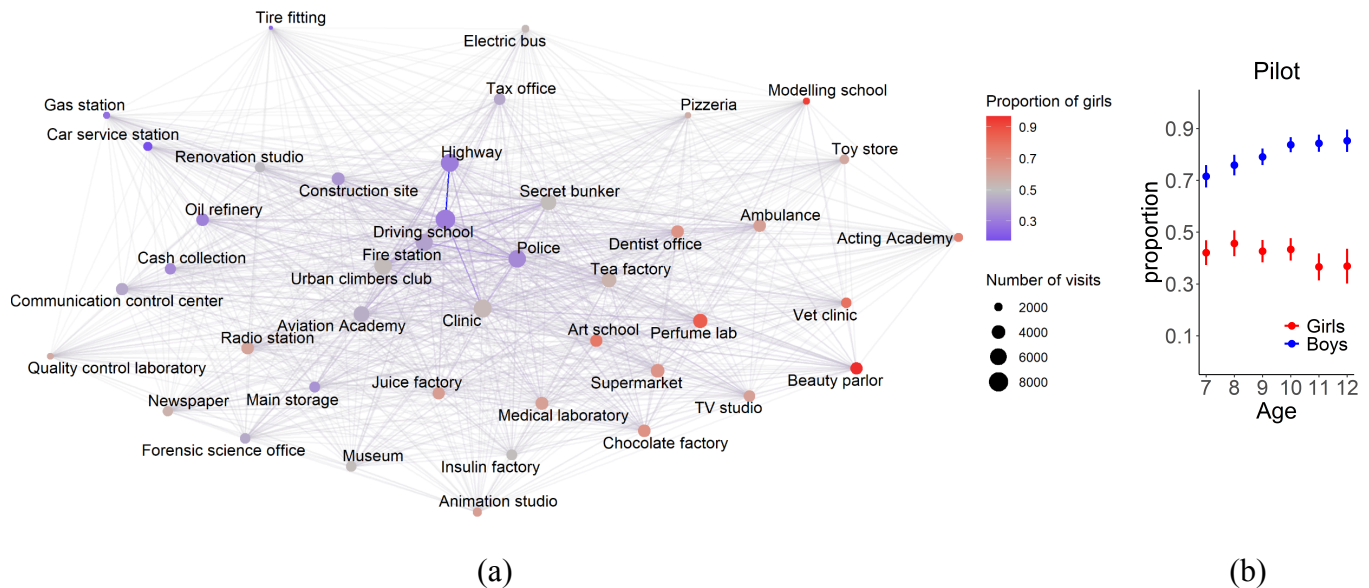(a)   (b)

Figure 1. The network of co-visited locations (the width of the line is proportional to the frequency of co-visiting) (a), and how pilot preference changes with age (b).

Our approach allowed us to look at the relationship of locations, rather than just the percentages of girls for each location. Analysis of co-visiting shows that although there are gender-specific locations and a tendency toward homophily, it is not very pronounced, so children try out different things.

References

1. Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of economic literature*, 55(3), 789-865.
2. He, J. C., Kang, S. K., Tse, K., & Toh, S. M. (2019). Stereotypes at work: Occupational stereotypes predict race and gender segregation in the workforce. *Journal of Vocational Behavior*, 115, 103318.
3. Bian, L., Leslie, S. J., & Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science*, 355(6323), 389-391.
4. Guimond, S., & Roussel, L. (2001). Bragging about one's school grades: Gender stereotyping and students' perception of their abilities in science, mathematics, and language. *Social psychology of education*, 4(3), 275-293.
5. Makarova, E., Aeschlimann, B., & Herzog, W. (2019). The gender gap in STEM fields: The impact of the gender stereotype of math and science on secondary students' career aspirations. *Frontiers in Education*, 4, 60.
6. Kaufman, G., Flanagan, M., & Freedman, G. (2019). Not Just for Girls: Encouraging Cross-Gender Role Play and Reducing Gender Stereotypes with a Strategy Game. In *Proceedings of the Annual Symposium on Computer-Human Interaction in Play*, 481-493.
7. Murphy, B. (2019). These medical specialties have the biggest gender imbalances. *American Medical Association.* October, 1.
8. Siyanova-Chanturia, A., Warren, P., Pesciarelli, F., & Cacciari, C. (2015). Gender stereotypes across the ages: on-line processing in school-age children, young and older adults. *Frontiers in Psychology,* 6:1388.