COMPARATIVE MARRIAGE MARKETS:
AVAILABILITY OF UNION FORMATION FOR SAME-SEX AND MALE-FEMALE UNIONS IN THE UNITED STATES

Eric Ketcham
CUNY Institute for Demographic Research and the Graduate Center, CUNY

Extended abstract submitted for consideration for presentation at the 2019 meetings of the Population Association of America

Abstract

Marriage markets for male-female unions have been studied for decades to better understand the extent to which suitable partners exist for a given individual interested in a partner of a different sex. However, no comparable research has been done on the same-sex marriage market. The current paper seeks to extend the existing research to investigate whether marriage markets for LGBT-identified individuals are balanced. The number of LGBT-identified individuals at given ages are calculated using the Gallup Daily tracking poll (Gallup 2018). Age preferences will be calculated using observed cohabiting same-sex couples in the 2010 Census 10% PUMS (Ruggles et al. 2018). Calculations will be made using Goldman and colleagues' Availability Ratio (1984) as well as Lampard's Iterated Availability Ratio (1993), adapted to reflect same-sex rather than different-sex marriage markets.

Introduction

Union formation is dependent upon the availability of suitable partners, or marriage markets. Marriage market research has been conducted for male-female unions, but this literature has not yet been extended to same-sex marriage markets. In the context of male-female unions, Goldman, Westoff, and Hammerslough (1984) developed an Availability Ratio to measure the relative availability of suitable partners for a given individual. A balanced marriage market is one in which the ratio of potential partners for an individual to the potential partners for those partners is equal to one. As Goldman and colleagues explain, if we take the example of a given woman who has 100 potential male partners available to her of suitable age, level of education, etc., and each of those potential partners has 100 potential female partners, then the ratio of the number of potential suitors for that woman to the number of potential suitors for those suitors is one, indicating a balanced marriage market. A ratio higher or lower than one would indicate an imbalanced market, with more potential partners for one group than for another.

Goldman and colleagues' (1984) Availability Ratio was refined by Lampard (1993), resulting in the Iterated Availability Ratio, which improves upon how the Availability Ratio accounts for competition in the marriage market. Empirical age preference data were applied to this measure for male-female unions in England and Wales by Ní Bhrolcháin (2004). This study will seek to adapt the Iterated Availability Ratio to apply to LGBT-identified men and women, extending the marriage market literature to the same-sex marriage market context. With Gallup Daily tracking data (Gallup 2018), individuals will be categorized by LGBT self-

identification, gender and age. Age preferences will be estimated from same-sex cohabitational unions observed in the 2010 Census (Ruggles et al. 2018). The Availability Ratio and the Iterated Availability Ratio measure will be used to calculate whether same-sex marriage markets are balanced, and if so at which ages and for which gender(s).

It is important to study same-sex marriage markets given that there is reason to believe that same-sex and male-female unions are formed under different conditions, such as the average level of familial support, average age at first union, etc. Factors determining union formation may vary by gender composition. Further, the likelihood of cohabitational union formation for same-sex couples depends on how supportive the social context is (Prince, Joyner, and Manning 2017).

Data and Methods

The Gallup Daily tracking survey provides data on the geographic distribution of LGBT-identified individuals across the United States. This Gallup survey gathers data from approximately 1,000 different respondents for each of 350 days out of the year, for a total of approximately 350,000 individuals surveyed per year. The survey has taken place since 2008, and added a question on LGBT-identification in 2012. The LGBT-identification question allows only a dichotomous response to indicate identification with any of the four identifications lesbian, gay, bisexual, or transgender. Unfortunately it is not possible to disaggregate with which identity the respondent identifies from this question. While transgender identification included with LGB identification may

introduce some error in estimation of same-sex marriage markets, a 2011 report from the Williams Institute, estimating the proportion of the population of the United States identifying as LGBT, indicates that the transgender population is relatively small compared to both the population of the United States as a whole (approximately a third of a percent of the population of the Unites States), as well as compared to the proportion of the United States identifying as lesbian, gay or bisexual (approximately three and a half percent of the United States population) (Gates 2011). Moreover, transgender identification represents only about one-tenth of LGBT identification more generally (Gates 2011). As of 2016, approximately four percent of respondents in the Gallup Daily Tracking survey identify as LGBT (Gates 2017). Additional questions on marital status, age, and gender are also used in order to identify respondents who are single and to calculate availability of partners given theorized preferences.

Preliminary analyses in this paper use the Availability Ratio (AR) to calculate the balance of marriage markets for LGBT identified men and women in a given age group. The measure was developed by Goldman and colleagues (1984), who build their measure on earlier ratios including those of Akers (1967) and Hirschman and Matras (1971). Whereas Akers (1967) and Hirschman and Matras (1971) based their measures on the number of females in a certain age group to males of a certain age group, a simple ratio of two numbers, Goldman and colleagues (1984) accounted for competition between individuals for the same potential partners by including in the denominator of their measure the average number of partners available to a given individual, given the potential partners available to their potential partners. The Availability Ratio for the same-

sex context is calculated for an individual age *i* as follows, notation adapted from Lampard (1993):

$$AR_i = \frac{\sum_j P_j S_{ij}}{\left[\frac{\sum_k P_k S_{kj}}{\sum_j P_j S_{ij}}\right]}$$

where P_j is the number of persons age *j* and S_{ij} is the suitability of persons age *j* for persons age *i*, such that S_{ij} is equal to 1 if persons age *j* are suitable for persons age *i*, and S_{ij} is equal to 0 if unsuitable. Separate calculations are carried out for men and for women.

Additional analyses will use the Iterated Availability Ratio (IAR) to calculate the balance of marriage markets for LGBT-identified men and women in a given age group. The IAR was developed by Lampard (1993), who adapted it from the availability ratio used by Goldman and colleagues (1984). Although Goldman and colleagues' AR takes into account competition for the same potential partners, the number of calculated potential partners calculated by the AR does not necessarily add up to the actual available population. Lampard's IAR improves upon Goldman and colleagues' AR by distributing potential partners in an iterative fashion such that the number of potential partners across the market sums to the number of available individuals within the market. The Iterated Availability Ratio for individual *i* is computed as follows, notation from Ní Bhrolcháin (2004):

$$IAR_i = \sum_j \frac{\lambda_{ij}/IAR_j}{\sum_k \lambda_{kj}/IAR_k}$$

where λ_{ij} represents an age preference weight for the proportion of individuals age i who would accept a partner of age j (which represents the preferences of a person of particular age for partners of all ages), and λ_{kj} represents the age preference weight for the proportion of individuals of age j would accept a partner of age k (which represents the combined preferences of individuals of all ages for partners of a particular age). For example, if we let i represent an individual of age 25, λ_{ij} represents the age preferences of 25-year old individuals for their partners – that is, what proportion of 25-year olds would accept a partner of age 20, 21, 22, etc. In contrast, λ_{kj} represents the preferences of individuals of all ages for 25-year olds – that is, a 25-year old individual would acceptable to what proportion of individuals of age 20, 21, 22, etc.

Lampard (1993) used 1981 Census data from England and Wales to observe age combinations within different-sex marriages in order to estimate age preferences. Ní Bhrolcháin (2004) improved upon Lampard's (1993) calculation of marriage preferences by using data from a dating agency in which users of the dating agency reported the maximum and minimum ages at which they would consider a partner. While observed matches in a census provide data on matches that have already formed as a function of the marriage market, dating agency data present preferences on with whom an individual would consider partnering.

In the absence of dating agency data for the U.S. same-sex marriage market, age preferences will be estimated using empirical data on same-sex

coresidential unions from the 2010 Census to provide calculations of the number of potential partners for a given individual of a particular gender and age. Average age differences between coresidential same-sex partners can been seen in Figure 2. Preliminary analyses compared the 2012-2016 ACS 5-year estimates and the 2010 Census 10% PUMS for differences in same-sex union patterns and found that same-sex union patterns do not differ widely between these two data sets. Comparison was also made among Metropolitan Statistical Areas (MSAs) (see Figure 1). No large differences were found among MSAs. In order to maximize sample size, and given these preliminary results in comparing union patterns between the 2012-2016 ACS and the 2010 Census, the 10% sample of the 2010 Census is preferable to the 5% sample of the 2012-2016 ACS. Additionally, since no major differences by city were found, national data will be used to estimate same-sex marriage markets. Minimum and maximum ages of unions are considered the minimum and maximum ages at which 5% of observed unions with a partner of a given age are observed. This method of calculating age preferences is based on Goldman and colleagues' (1984) use of a threshold of 2% of observed unions within a given age combination. To account for outlier age combinations, if fewer than 5% of couples were observed for three age combinations in a row above or below an age combination containing 5% of observed unions, then no higher or lower ages were considered suitable for that given age. For example, greater than 5% of male-male couples with one partner age 51 were with another partner age 47, however fewer than 5% of male-male couples with one partner age 51 were with partners age 46, 45, or 44. Although greater than 5% of male-male couples with one partner age 51 were with another

partner age 41, this is not considered a suitable age combination since it is an outlier in the data.

The method of using observed couples to estimate suitable age combinations is not perfect, as Goldman and colleagues (1984) acknowledge, for multiple reasons. One reason is that observed unions reflect the structure of the marriage market as much as they do they preferences of the individuals in the marriage market, since they are the outcomes of the market itself. Another reason is that a small proportion of unions fall in age combinations that are older or younger than the considered maximum or minimum ages, thereby theoretically making those unions unsuitable matches.

Conclusions

While male-female marriage markets have been studied for decades, largely framed around the concept of the marriage market squeeze (Akers 1967, Hirschman and Matras 1971, Goldman et al. 1984, Lampard 1993, Ní Bhrolcháin 2004, *inter alia*) to the author's knowledge no work has yet been done to extend this research to the same-sex marriage market. The current paper seeks to adapt Goldman and colleagues' Availability Ratio (1984) and Lampard's Iterated Availability Ratio (1993) to LGBT-identified individuals seeking partners of the same-sex.

Using a preference distribution based on empirical observations of coresidential same-sex unions, preliminary Availability Ratios have been calculated (see Table 1). This preference distribution for men yields a market that favors men in their late 20s. Men in their early 20s, as well as in their early and

late 30s are at a disadvantage in the same-sex marriage market. Men in their 40s and older experience a largely balanced market. While the Availability Ratio distribution for women also indicates an advantage for those in their late 20s, the imbalances in the market within other age categories tend to be somewhat less severe compared to those for men in the same age categories. Women in their early 30s are at a relative disadvantage in the marriage market, however the marriage markets for those at ages 35 and above are largely balanced.

These preliminary findings are, of course, based on one possible preference distribution inferred from empirical observations of coresidential same-sex unions. However, empirical observations of unions do not provide a perfect measure of preferences. Unions that have already formed are a function of the marriage market themselves, and may not reflect the true preferences of the individuals within those unions. Additionally, the age of an individual's partner does not necessarily reflect the maximum or minimum age that such an individual would accept, but rather the age of the one partner with whom that individual formed a union. Ideal data on age preferences would identify the maximum and minimum ages a given individual would accept for a potential partner, as well as the strength of their preference for a partner of each age. In the absence of the availability of these data, the 2010 Census 10% PUMS provides observations of actual unions formed.

In addition to preference distributions, the author will test theoretical preference distributions. One possible distribution is that individuals will accept only those who are within ten years-of-age of themselves, with stronger preferences for those that are closer to their own age. To represent this

mathematically, allow 1 to equal the strongest possible preference for a particular age group and 0 to equal rejection of a particular age group. An individual age *i* may have a preference equal to 1 for another individual age *i,* a preference of 0.9 for someone of age $i \pm 1$, a preference of 0.8 for someone of age $i \pm 2$, a preference of .7 for someone age $i \pm 2$, and so on, with preferences of 0 for those who are ten or more years older than themselves or ten or more years younger than themselves.

Another potential preference distribution is that individuals prefer younger partners regardless of their own age. In this theoretical preference distribution, individuals at any age would prefer to form a union with another individual in their 20s. These two possible are loosely based on findings from Rudder (2015), in which different-sex attracted OKCupid users between the ages of 20 and 50 rated the attractiveness of potential partners. At most ages females rated males within a couple of years of their own age as the most attractive, with females in their 40s tending to rate males five to ten years younger than themselves most attractive. Males rated females in their early 20s the most attractive regardless of their own age. Further analyses in this paper will test the effects of such theoretical preference distributions on the AR and IAR for males and females in same-sex marriage markets.

References

Akers, D.S. (1967). "On Measuring the Marriage Squeeze." *Demography, 4*: 907-924.

Gallup. (2018). *Gallup Daily tracking survey, 2012-2017 Combined* [Computer file].

Gates, G. (2011). "How Many People are Lesbian, Gay, Bisexual, and Transgender?" *The Williams Institute,* April 2011. Retrieved from https://williamsinstitute.law.ucla.edu/wp-content/uploads/Gates-How-Many-People-LGBT-Apr-2011.pdf

Gates, G. (2017). "In US, More Adults Identifying as LGBT." *Gallup,* 11 January 2017. Retrieved from http://news.gallup.com/poll/201731/lgbt-identification-rises.aspx

Goldman, N., Westoff, C.F. and Hammerslough, C. (1984). "Demography of the Marriage Market in the United States." *Population Index, 50*(1): 5-25.

Hirschman, C. and Matras, J. (1971). "A New Look at the Marriage Market and Nuptiality Rates, 1915-1958." *Demography, 8*: 549-569.

Lampard, R. (1993). "Availability of Marriage Partners in England and Wales: A Comparison of Three Measures." *Journal of Biosocial Science, 25*: 333-350.

Ní Bhrolcháin, M. (2004). "Demographic Decomposition of the Marriage Market in England and Wales 1911-1991." (S^{3}RI Applications and Policy Working Papers, A04/06). Southampton, UK: University of Southampton. Retrieved September 20, 2017 from <https://eprints.soton.ac.uk/8158/>

Prince, B.F., Joyner, K. and Manning, W.D. (2017). "Sexual Minorities, Social Context, and Union Formation." (Center for Family & Demographic Research Working Paper No. 2017-07). Bowling Green, OH: Bowling Green State University. Retrieved August 28, 2017 from <https://www.bgsu.edu/content/dam/BGSU/college-of-arts-and-sciences/center-for-family-and-demographic-research/documents/working-papers/2017/WP-2017-07-Prince-Sexual-Minorities-Social-Context.pdf>

Rudder, C. (2015). *Dataclysm: Love, Sex, Race, and Identity – What Our Online Lives Tell Us about Our Offline Selves*. New York: Broadway Books.

Ruggles, S., Flood, S., Goeken, R., Grover, J., Meyer, E., Pacas, J., and Sobek, M. (2018). *IPUMS USA: Version 8.0* [dataset]. Minneapolis, MN: IPUMS. https://doi.org/10.18128/D010.V8.0

Tables

Table 1. Availability Ratios (ARs) for LGBT-Identified Males and Females.[a]

Age category	Males	Females
20-24	0.91	0.97
25-29	1.21	1.33
30-34	0.91	0.92
35-39	0.93	0.96
40-44	0.99	1.01
45-49	1.06	1.03
50-54	0.93	0.95
55-59	1.00	0.99
60-64	1.01	1.05

[a]Note that Availability Ratios were calculated for ages 18 to 95. To avoid miscalculations at the youngest and oldest ages in the distribution, only ages 20 to 64 are presented.

Figures

Figure 1. Comparison of Mean Difference in Age of Partners in Coresidential Unions Using the 2012-2016 ACS 5-Year Estimates and the 2010 Census for 18 Metropolitan Statistical Areas.

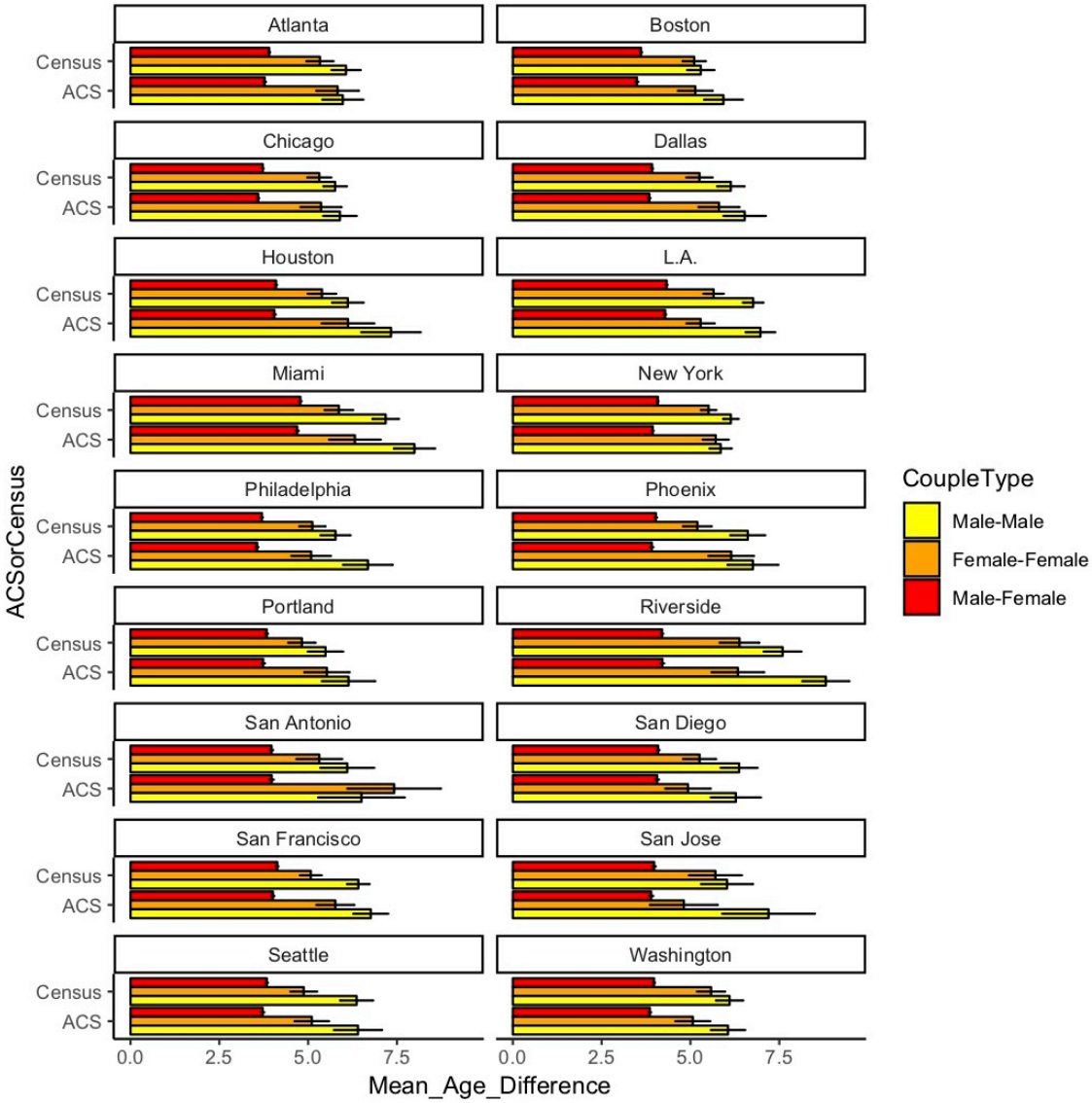

Figure 2. Absolute Value of Age Differences within Coresidential Same-Sex Couples.