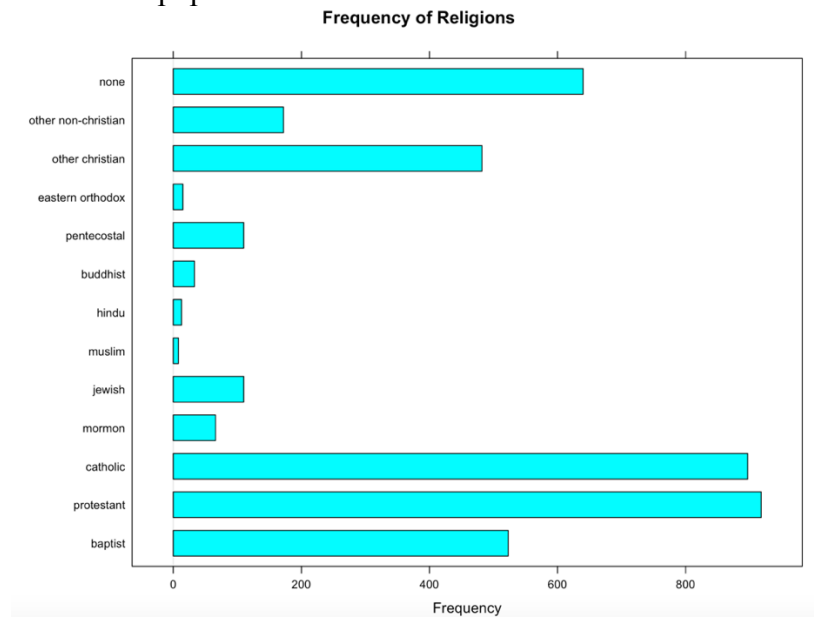


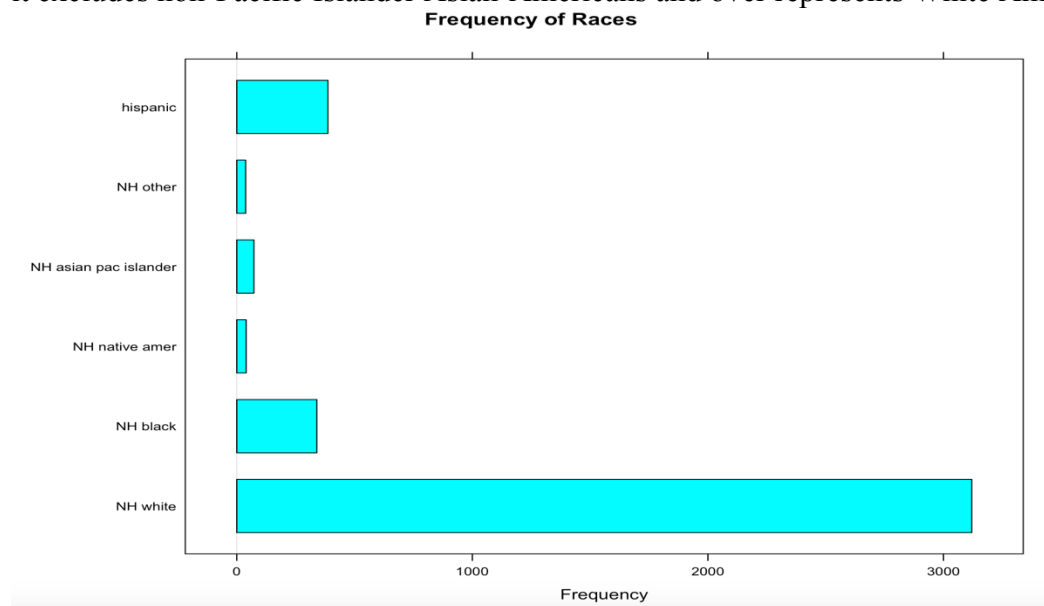
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Homework 3

The dataset explored in this report is pulled from Stanford's How Couples Meet and Stay Together study about Americans and their romantic partners. The study was conducted through surveys over a period of 5 years to over 3000 subjects from 2009 to 2015. The questions pertained to information about the subject and their partner. This report includes demographic breakdowns and investigations of potential connections between variables like breakups, relationship quality, and couple characteristics.

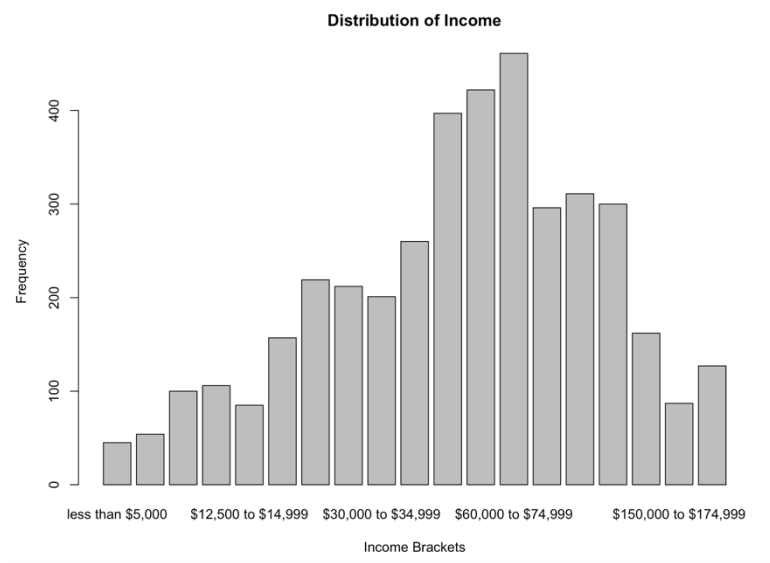
1. Three categorical variables include: gender, religion, and race. Three ordinal variables include: ID (case ID number), partner_age (partner's age), and survey_date (date subject took survey as YYYYMM). Three numerical variables include: years_live_together (years spent living together), years_relationship (years spent in a relationship together), and years_edu (the subject's years educated). Income is binned because the output for each participant is a range of values and doesn't offer the specific value. For example, \$35,000 to \$39,999 is one bin and \$40,000 to \$49,999 is the next bin. These are artificial categories. Relationship_quality (subject's reported relationship quality) might've been binned because the categories are broader and include very poor, poor, fair, good, and excellent. The participants' responses could've been much more detailed. Gender_attraction (which gender subject is most attracted to) also has the potential to have been binned. Participants could have offered much more detailed and nuanced responses than the categories the data provides: opposite gender only, mostly opposite, both genders equally, same gender mostly, and only same gender.
2. The demographic breakdown of the subjects in terms of religion is Baptist, Protestant, Catholic, Mormon, Jewish, Muslim, Hindu, Buddhist, Pentecostal, Eastern Orthodox, Other Christian, Other Non-Christian, and None (assumed to be Atheist/Agnostic). These are ordered here by frequency. The frequencies of different religions seem representative of the U.S. population.



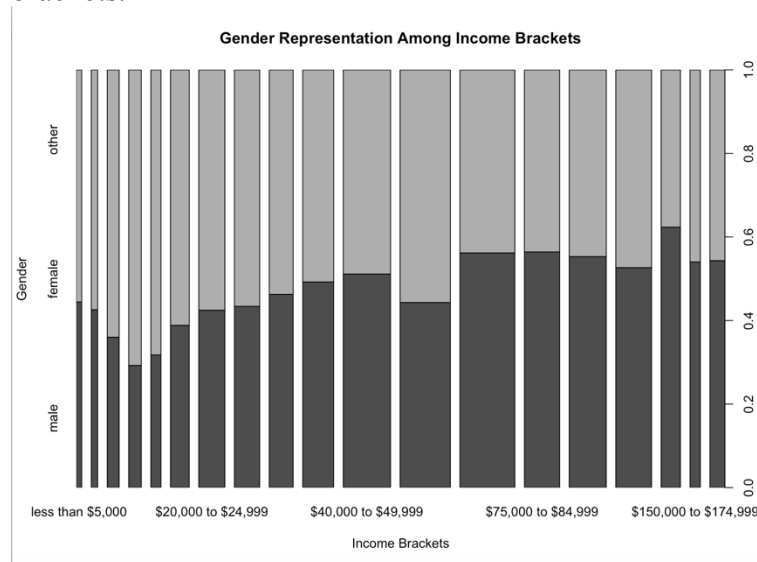
Breakdown by race, ordered by frequency, includes Non-Hispanic and Hispanic. Under Non-Hispanic there is White, Black, Native American, Asian Pacific Islander, and Other. The subject pool does not seem representative of the United States in terms of race since it excludes non-Pacific Islander Asian-Americans and over represents White Americans.



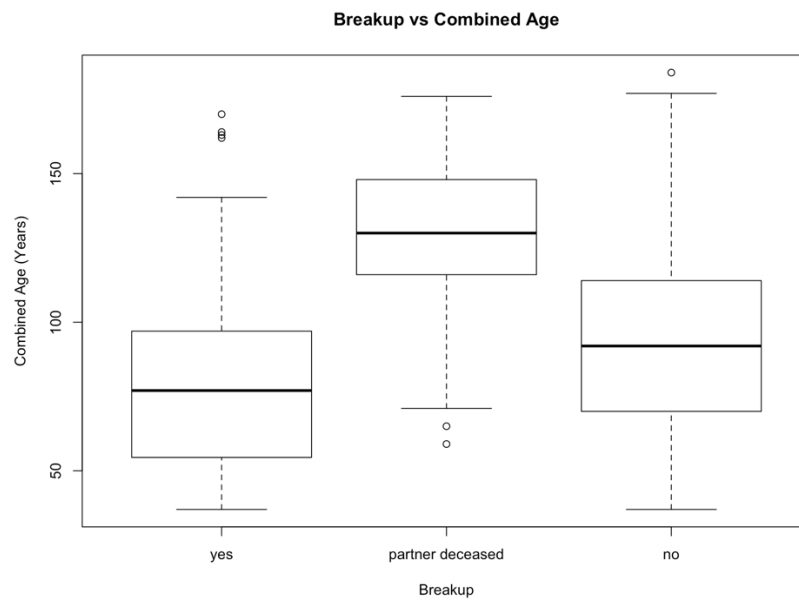
Breakdown by age includes a range from 19 years old to 95 years old with a mean age of 47 years. Most ages are located between 34 years old and 59 years old. Breakdown by political party is pretty evenly split between Republican and Democrat, with a handful of Other. Breakdown by gender is also nearly evenly split between Male and Female. We know that 15% of the couples are homosexual, so there is representation of homosexual relationships. The distribution of income shows more representation of higher income households. Median household income in 2014 was \$53,482. We can tell visually from the bar chart that the data is not inconsistent with the Census median household income.



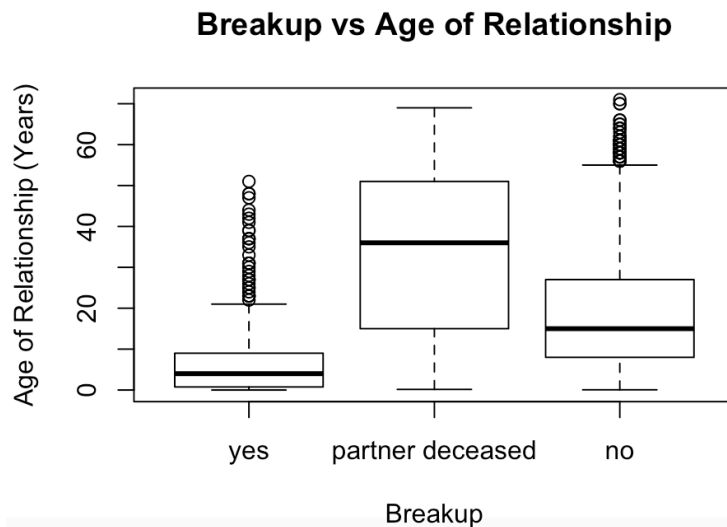
However, both males and females were represented fairly equally among all income brackets.



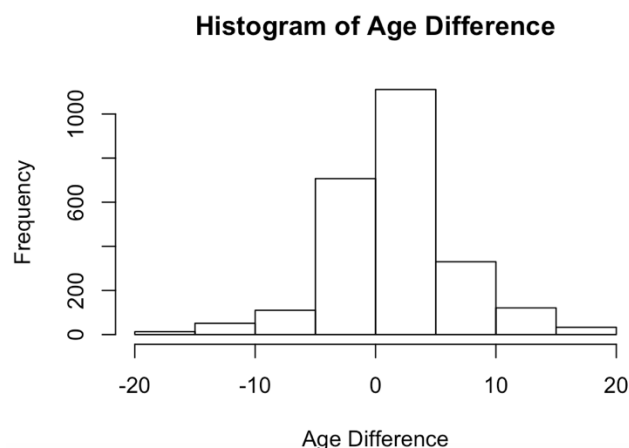
3. 12.56% of the survey subjects who answered the breakup question eventually broke up. 13.49% of subjects who answered the got married question eventually got married. Around 6% of unmarried subjects eventually got married and broke up. Subjects who got married and broke up all had excellent or good self-reported relationship quality before getting married.
4. There seems to be a connection between the age of couples (both partner and subject) and whether they break up. Couples that did not break up tend to be couples with a higher combined age than couples who did break up. Older couples are less likely to have broken up after the survey was taken. On a side note, couples with at least one deceased person tend to have a much higher combined age, which is not surprising.



It appears that there is also a connection between the age of the relationship and whether couple broke up. Couples with older relationships were less likely to break up than couples with shorter relationships.

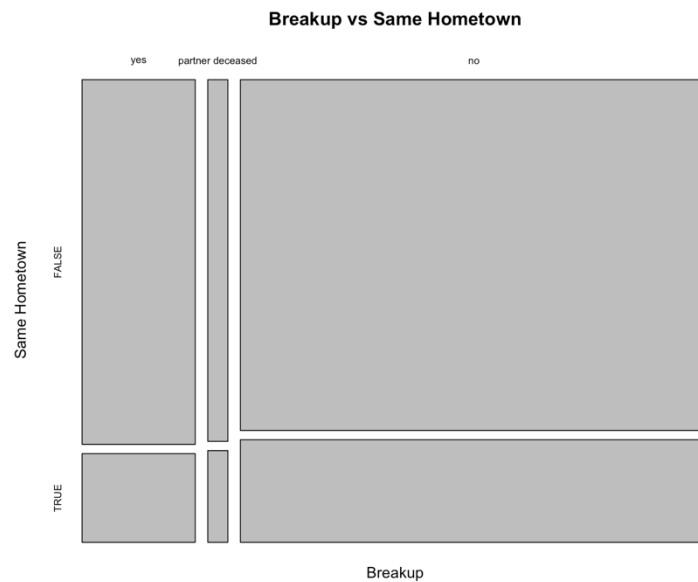


- The typical age difference between partners is 2 years, calculated by subtracting the median partner age from the median participant age. Among heterosexual couples, males tend to be older, and they tend to be older by 2 years. In the histogram below, negative age differences represent couples where the female is older, and positive age differences represent couples where the male is older.

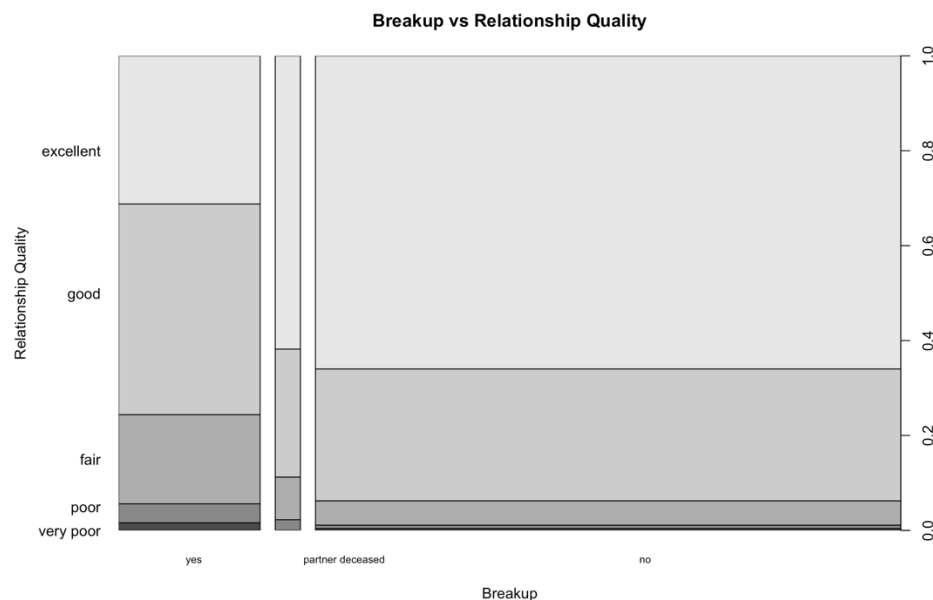


- The data suggest that common religion has a connection to whether or not a couple broke up. 24% of couples with different religions broke up whereas only 13% of couples with the same religion broke up. To really verify if common religion has a connection to not breaking up, one would have to perform a hypothesis test. However, the data suggest that common education is not connected to whether or not the couple broke up. 19% of couples with different years of education broke up as opposed to 17% of couples with the same years of education. This is a negligible difference. The same can be said for political party. 19% of couples from different political parties broke up whereas 16% of couples from the same political party broke up. This can also be applied to same

hometown. 19% of couples with different hometowns broke up whereas 16% of couples with the same hometown broke up. Again, this is so small it is negligible. As can be seen in the mosaic plot below, same hometown has pretty much no impact on breakup.

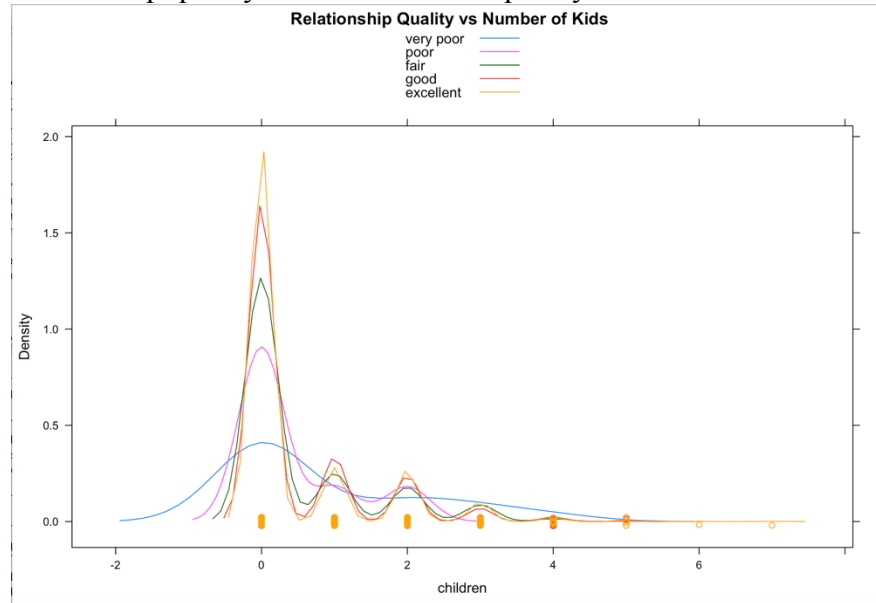


- There is a negative relationship between self-reported relationship quality and probability of breaking up. Most participants reported positive (good or excellent) relationship quality. The probability of breaking up if the participant reported positive relationship quality was much lower than if the self-reported relationship quality was neutral to negative (fair, poor, very poor).

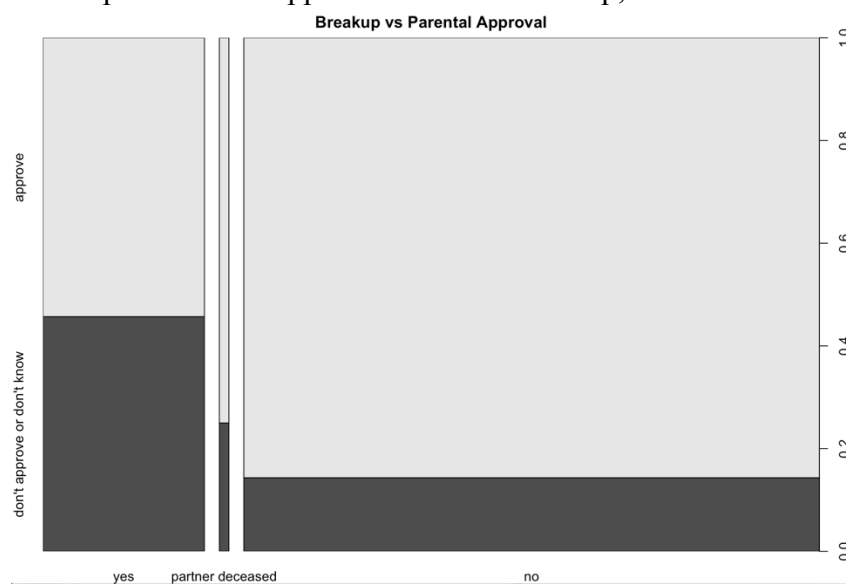


There is a connection also between relationship quality and number of children. Higher number of children is associated with lower relationship quality. Relationship qualities with high spikes in the density plot below have more data grouped around zero children.

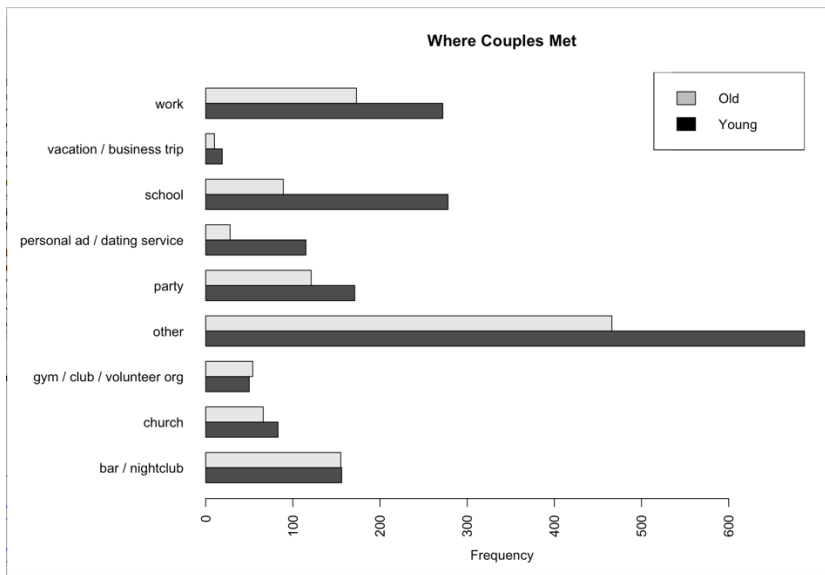
Excellent relationship quality had the highest frequency of zero children and very poor relationship quality had the lowest frequency of zero children.



It seems that higher rates of parental approval are related to a lower likelihood of breakup. Relationships with parental approval had a significantly lower probability of breakup. As we determined earlier, breakup and relationship quality are highly correlated. Therefore, we can apply the strong correlation of breakup and parental approval to relationship quality and parental approval. It is possible that low relationship quality causes parents to disapprove of the relationship, but we can't assume causality.

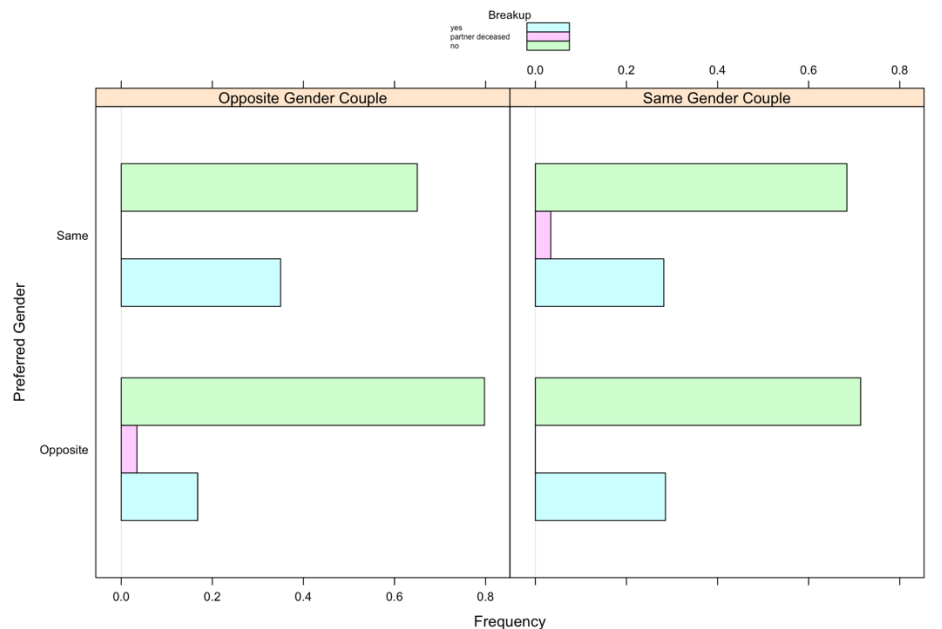


8. Couples meet at bars or nightclubs, church, gym or club or volunteer organizations, parties, school, work, through personal ads or dating services, and vacations or business trips. Work, school, personal ads and dating services, and parties were much more popular meeting places among young people. Many participants, both young and old, reported "other" as the meeting place and/or method, but for young people it was much more frequent.



In addition, 11% of young couples met online as opposed to only 3% of old couples.

9. A minority of subjects were dating someone from the gender they were less attracted to. 35% of people mainly attracted to the same gender and dating someone of the opposite gender were in a relationship that eventually broke up. 40% of people mainly attracted to the opposite gender and dating someone of the same gender were in a relationship that eventually broke up. The break up rate for these couples is definitely higher than for couples whose gender attraction matched their partner's gender. However, there were so few couples that fit into this category that it is almost impossible to say that there is a connection.

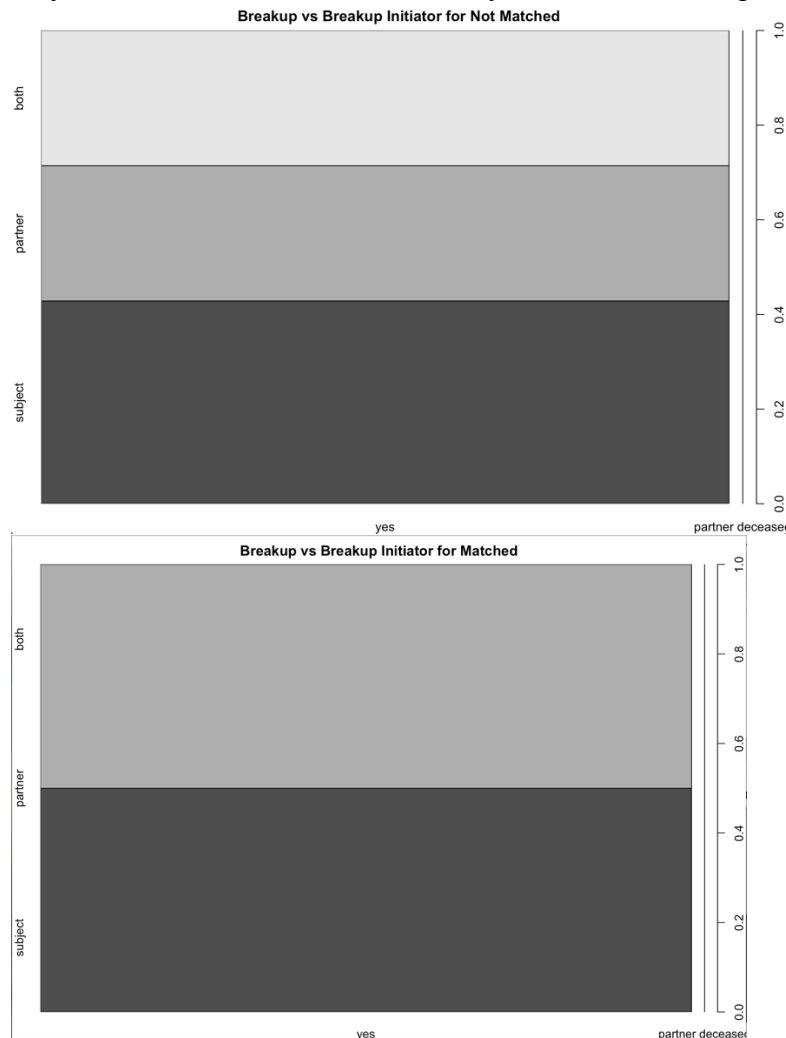


From the bar plots above, we can see that “matching” (i.e. preferred gender and partner gender match) heterosexual relationships had a much lower probability of breakup than

non-matching heterosexual relationships. However, for same gender couples, the probability of breakup among matching and non-matching couples was very similar. This could be because it is less likely for an individual to be pressured into a same gender relationship than an opposite gender relationship if their preferred gender and partner gender do not match. If one aggregates the probabilities of breakup for matching and separately for non-matching couples, it is clear that matching couples have lower likelihood of breaking up.

10.

- a. Were participants who were dating the gender they were less attracted to more likely to be the initiator of the breakup? It appears that they were less likely to be in a situation where their partner wanted to breakup more than they did. They were also more likely to be in a situation where both of them wanted the breakup equally. These participants were less likely to want the breakup more than their partner did, but they were much more likely to desire a breakup in general and have their partner want to break up too. This is an important question to ask because one might wonder whether a person who is dating someone of the gender they are less attracted to is more likely to desire a breakup.



- b. Is there a relationship between relationship quality and years since meeting? Couples that had met each other 20 years ago had the highest frequency of very poor relationships. Very poor relationships showed up the most in couples who had met 10 years ago up to 30 years ago. Excellent relationships were mainly found in couples with less time since they first met, but they were more spread out than the very poor relationships. Most good and fair relationships belonged to couples who had recently met.



- c. Is there a relationship between relationship quality and income? Does having more money mean a better relationship quality? It appears that, no, income does not correlate with relationship quality. Most participants, regardless of income level, reported excellent or good relationship quality. This is definitely a limitation of this study. Most people who took the survey had positive self-reported relationship quality.

