

# LGBTQ Connection Preliminary Analysis

*December 13, 2019*

## Outstanding questions/notes re the data:

- There are seven participants with pre/post data but no demographic data so were not included in the analysis. These were:
  - SWE Participant IDs: 4.7.1, 4.7.119, 4.7.143, 4.7.294, 4.7.295, 4.7.4, 4.7.9
- There are often dates in the “Entry participant services” field that precede the date of the pre-survey. For this reason, we analyzed the data in two separate groups. First, we only included participants whose earliest date in the “Entry participant services” field is at most 31 days before the date of the pre-survey (i.e. those for whom we can pretty confidently say that changes from pre to post are due to being involved in the program). Second, participants who had their earliest date in the “Entry participant services” field more than 31 days before their pre-survey date (where presumably the program has been having impact for awhile, so comparing the pre/post survey findings isn’t necessarily as meaningful or informative - or at best it’s apples and oranges to the first group).
  - Among all of the participants who had demographic data and a pre and/or post-survey,  $n = 30$  had a pre-survey date within 31 days of their first visit and  $n = 35$  had a survey date more than 31 days away from their first visit.
  - The maximum difference between the dates in the two fields was 378 days - meaning for at least one person, they appear to have been in the program for a year before they even took their pre survey.
  - Note that this caused a problem with small sample sizes (once account for missingness in key covariates, only have 3 observations to use for group 1 (<31 days from entry to pre) and 13 observations to use for group 2 (>31 days in the program before pre). Therefore, we omitted rejection-related outcomes from adjusted (regression) models because there weren’t enough observations for meaningful outputs.

If you think we are misunderstanding the “Entry participant services” field and should handle this differently, let us know!

## Notes for analysis:

- We performed many different hypothesis tests, so may want to adjust for multiple comparisons in final analysis (this is best practice but means that things may be less likely to be statistically significant).
- For what we present here, adjusted and unadjusted analyses include different numbers of people (unadjusted analyses include those with missing values for sexual orientation, gender identity, race/ethnicity, or YLT participation).
- **It is very important to use caution** when interpreting any of these results. Note that with such small sample sizes (especially since we split the already small number of participants into two groups for analysis as described above), almost none of the results here are statistically significant (and without adjusting for multiple comparisons, even those that are statistically significant may be anomalies). This means that estimates presented on the following tables might be quite inaccurate at this point. Once the study size is larger and the estimate becomes more precise, it is possible that the estimate will change a lot, and something that looks like a big difference now will become negligible, or even something that looks like it’s worsening on average from pre to post could suddenly appear to be improving from pre to post (or vice versa). Use this preliminary analysis as a guide-post and starting place for discussions about any programmatic/data collection changes you want to implement, and not as very valuable for learning about the impact your program is having on participants to date. Let us know if you have any questions about this!

## Results:

**Table 1** shows the unadjusted average change in score from pre survey to post survey in 6 outcome measures, for those who were in the program longer than a month at the time they took the pre survey.

Table 1: Unadjusted pre-post differences in six outcome measures (paired t-test results) for group with greater than 31 day difference between pre-survey date and first participation date

Outcome measure	Estimate (Mean of post-pre score)	t-statistic	CI low	CI high	p-value
Isolation	0.07	0.15	-0.91	1.06	0.88
Rejection	0.38	1.85	-0.05	0.81	0.08
Kessler 6	-0.98	-1.00	-2.98	1.03	0.33
Distress	-0.28	-0.69	-1.12	0.56	0.50
Community connectedness	-0.04	-0.14	-0.57	0.49	0.89
Positive self-regard	0.65	1.15	-0.52	1.83	0.26

Estimates with negative numbers ( $<0$ ) mean the outcome improved from pre to post, (e.g. people reported feeling less isolated at post) and estimates with positive numbers ( $>0$ ) mean the outcome worsened from pre to post (e.g. people reported a greater sense of isolation at post). Note that these results should be interpreted with caution because:

- none of the results are statistically significant (Rejection is the only one that gets close), which is due to either to small sample size or to their not being a true effect;
- these are unadjusted, which means things like gender identity, sexual orientation, race/ethnicity, etc. have not been taken into account, and
- these are all people who were in the program for awhile before taking the pre survey, so it's hard to know why the change occurred during the pre-post interval.

**Table 2** shows the average change in score from pre to post survey in 5 outcome measures (note that rejection was left out as an outcome due to tiny sample size in this case) given frequency of meeting attendance, adjusting for sexual orientation, gender identity, race/ethnicity, and YLT participation. Again, this is only for people who had been in the program for longer than a month before taking the pre survey.

Table 2: Adjusted estimates for pre-post differences in group with difference between pre-survey and first participation date greater than 31 days

	Outcome measure				
	Isolation (1)	Kessler 6 (2)	Distress (3)	Community connectedness (4)	Positive self-regard (5)
Frequency of meeting attendance	0.09 (-0.12,0.30)	0.49** (0.13,0.85)	0.17** (0.06,0.28)	-0.08 (-0.17,0.01)	-0.22 (-0.46,0.02)
Bisexual	-2.78 (-6.68,1.12)	5.62 (-1.04,12.28)	1.19 (-0.87,3.25)	-2.23** (-4.11,-0.35)	-1.91 (-6.76,2.94)
Gay	-3.53* (-7.26,0.20)	3.33 (-2.49,9.16)	1.90* (-0.10,3.89)	-2.71*** (-4.37,-1.05)	2.06 (-3.05,7.16)
Other (sexual orientation)	-1.79 (-5.24,1.65)	8.43** (2.68,14.17)	3.02** (1.16,4.88)	-1.66* (-3.19,-0.13)	-2.12 (-6.47,2.23)
Trans	0.21 (-2.60,3.02)	-2.44 (-6.93,2.05)	-1.51* (-3.11,0.08)	-0.59 (-1.88,0.69)	1.02 (-2.28,4.33)
Other (gender identity)	-0.12 (-3.91,3.67)	5.67 (-1.16,12.50)	-2.00* (-4.04,0.04)	1.08 (-0.61,2.78)	-0.60 (-4.56,3.35)
Latino	-0.38 (-3.63,2.88)	3.37 (-2.08,8.82)	2.28** (0.58,3.99)	-1.94** (-3.51,-0.37)	0.15 (-3.99,4.29)
Other race/ethnicity	-3.53 (-7.77,0.70)	-0.41 (-7.89,7.06)	0.19 (-1.94,2.32)	-1.53 (-3.71,0.65)	-1.44 (-6.44,3.55)
YLT Participation	-0.13 (-3.72,3.47)	-6.46* (-12.69,-0.23)	-2.82** (-4.84,-0.81)	1.38 (-0.27,3.02)	1.26 (-3.25,5.76)
Isolation (baseline)	0.37 (-0.26,1.01)				
Kessler 6 (baseline)		0.12 (-0.28,0.53)			
Distress (baseline)			0.04 (-0.34,0.41)		
Community connectedness (baseline)				0.56** (0.17,0.95)	
Positive self-regard (baseline)					0.91*** (0.44,1.39)
Intercept	3.28 (-0.58,7.13)	-0.18 (-7.76,7.40)	-0.34 (-2.32,1.63)	4.19*** (2.33,6.06)	3.81 (-5.08,12.69)
Observations	21	21	19	21	18

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Anything with two or three asterisks was a statistically significant finding (the more asterisks, the more significant the finding). So for example, for every extra meeting a participant attended during the study period, their Kessler 6 score *worsened* by about half a point (out of 24 points), when accounting for gender

identity, sexual orientation, race/ethnicity, and YLT participation. This result was statistically significant - but it's important to remember that this was only among people who had already been in the program for awhile before the pre-post surveys, meaning it's unclear what's really being measured for the effect of meeting frequency on outcomes.

As another example, people who were bisexual or gay saw significant improvements in their community connectedness scores from pre to post on average, compared to those who were heterosexual, when taking frequency of meeting attendance, gender identity, race/ethnicity, and YLT participation into account.

**Table 3** shows the unadjusted average change in score from pre survey to post survey in 6 outcome measures, for those who were in the program less than a month at the time they took the pre survey (i.e. the group for whom it's more reasonable to say the pre and post survey are measuring the potential change in mental health after the first 6 weeks of participation in the program).

Table 3: Unadjusted pre-post differences in six outcome measures (paired t-test results) for group with less than 31 day difference between pre-survey date and first participation date

Outcome measure	Estimate (Mean of post-pre score)	t-statistic	CI low	CI high	p-value
Isolation	0.04	0.08	-1.05	1.14	0.94
Rejection	0.23	1.65	-0.21	0.67	0.20
Kessler 6	-2.20	-1.79	-4.73	0.33	0.09
Distress	-0.25	-0.81	-0.89	0.39	0.43
Community connectedness	0.28	1.27	-0.17	0.73	0.22
Positive self-regard	1.62	3.49	0.66	2.59	0.00

In this case the only statistically significant finding was that positive self-regard increased (substantially!) from pre to post. The Kessler 6 also improved by more than 2 points on average (out of 24), though this result wasn't quite statistically significant, probably just a function of small sample size.

**Table 4** shows the average change in score from pre to post survey in 5 outcome measures (again rejection was left out as an outcome due to tiny sample size) given frequency of meeting attendance, adjusting for sexual orientation, gender identity, race/ethnicity, and YLT participation. This time the adjusted results are only for people who had been in the program for less than a month before taking the pre survey.

Table 4: Adjusted estimates for pre-post differences in group with difference between pre-survey and first participation date less than or equal to 31 days

	Outcome measure				
	Isolation (1)	Kessler 6 (2)	Distress (3)	Community connectedness (4)	Positive self-regard (5)
Frequency of meeting attendance	-0.04 (-0.24,0.17)	-0.06 (-0.54,0.42)	-0.03 (-0.18,0.12)	-0.0002 (-0.05,0.05)	-0.19* (-0.32,-0.05)
Bisexual	1.08 (-3.48,5.65)	2.90 (-6.72,12.52)	-0.56 (-3.29,2.18)	-1.28* (-2.33,-0.23)	-5.78** (-8.49,-3.07)
Gay	-5.16* (-10.28,-0.04)	-4.03 (-15.81,7.74)	-1.20 (-6.09,3.70)	0.16 (-1.22,1.54)	0.11 (-3.87,4.10)
Other (sexual orientation)	-0.72 (-5.69,4.26)	3.06 (-7.09,13.21)	0.32 (-2.58,3.22)	0.44 (-0.58,1.45)	-3.45* (-6.15,-0.75)
Trans	1.96 (-0.88,4.81)	5.89 (-0.53,12.31)	0.15 (-2.36,2.65)	-0.40 (-1.15,0.34)	1.62 (-0.39,3.63)
Other (gender identity)	0.66 (-2.27,3.59)	3.19 (-3.40,9.78)	1.11 (-0.86,3.07)	-0.87 (-1.77,0.03)	-0.75 (-2.49,0.99)
Latino	0.28 (-3.30,3.86)	-3.34 (-11.20,4.53)	-1.82 (-4.25,0.62)	0.13 (-0.96,1.21)	-2.71* (-4.83,-0.59)
Other race/ethnicity	1.38 (-2.35,5.11)	2.37 (-5.11,9.86)	-0.99 (-3.30,1.32)	0.12 (-0.76,0.99)	1.16 (-1.16,3.48)
YLT Participation	-3.57 (-8.15,1.01)	0.68 (-9.52,10.88)	1.32 (-2.21,4.86)	-0.13 (-1.31,1.06)	3.73* (0.59,6.87)
Isolation (baseline)	0.13 (-0.62,0.88)				
Kessler 6 (baseline)		-0.01 (-0.56,0.54)			
Distress (baseline)			0.20 (-0.55,0.96)		
Community connectedness (baseline)				0.28 (-0.17,0.73)	
Positive self-regard (baseline)					0.60** (0.27,0.93)
Intercept	5.75** (1.29,10.22)	9.64 (-1.61,20.90)	3.15 (-0.82,7.12)	2.60** (1.22,3.98)	11.00** (6.23,15.77)
Observations	17	17	17	17	15

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

This is likely the table of results where we are best measuring the real impact the program is having on participants. Note that in this case there are only a few statistically significant results (though this could improve with higher sample size). Isolation decreased substantially more for gay-identified participants

than for heterosexually-identified participants, when controlling for frequency of meeting attendance, gender identity, race/ethnicity, and YLT participation. Community connectedness scores were worse for bisexuals compared to heterosexuals when taking those other factors into account, and positive self-regard was also lower for people who identified as bisexual or “other”, compared to those who were heterosexual (the same was not true for gay-identified participants). Those who were Latinx had lower positive self-regard scores at post compared to those who were White, and those who attended meetings more frequently also had lower positive self-regard scores than those who attended fewer meetings. YLT participation, on the other hand, had a statistically significant positive impact on positive self-regard.

Tables 5 and 6 are intended to just paint a better picture of the samples we got. **Table 5** is illustrating how different the people were who never took the post survey (only the pre) from those who took both surveys. Those who were lost to follow up by the post survey were more likely to report isolation on the pre survey, and less likely to have positive self-regard, for example. But note that none of these differences are statistically significant. **Table 6** demonstrates that there wasn’t a statistically significant difference between the group of people who only took the pre and the group who took both prep and post, when it comes to sexual orientation, gender identity, race/ethnicity, and YLT participation. Again, though, it’s possible this finding is a function of sample size, and with more people there might be more detectable differences between those who remain and those who drop out.

Table 5: Mean differences in baseline values between those who completed only a pre survey and those with both pre and post surveys

Outcome measure	Estimate (Pre only-Both pre and post)	t-statistic	CI low	CI high	p-value
Isolation	1.10	1.48	-0.47	2.66	0.16
Rejection	0.31	1.82	-0.05	0.66	0.09
Kessler 6	0.33	0.19	-3.33	3.98	0.85
Distress	0.14	0.27	-0.96	1.24	0.79
Community connectedness	-0.19	-0.53	-0.95	0.57	0.60
Positive self-regard	-0.44	-0.54	-2.12	1.25	0.60

Table 6: Chi square test for independence to assess differences in baseline values between those who completed only a pre survey and those with both pre and post surveys

Covariate	Chi-square statistic	p-value	Degrees of freedom
Sexual orientation	3.09	0.38	3
Gender identity	1.18	0.55	2
Race/ethnicity	1.94	0.38	2
YLT participation	0.11	0.74	1

## Conclusions:

In summary, there are a few significant conclusions:

- There were no significant differences between the mean pre and post scores for the six outcome measures (unadjusted) in the group of participants who took their pre-survey more than 31 days after beginning the program.
- In the group of participants who took their pre-survey more than 31 days after beginning the program, adjusting for the other covariates:
  - Frequency of meeting attendance was statistically associated with post-survey Kessler 6 and distress scores. On average, a one unit increase in frequency of meeting attendance was associated with a 0.49 point increase in mean post-survey Kessler 6 score and a 0.17 point increase in mean post-survey distress score (unfortunately those both indicate minor *worsening* public health outcomes).
  - Participants who identified as bisexual had mean post-survey community connectedness scores that were on average 2.23 points lower than participants who identified as heterosexual.
  - Participants who identified as gay had mean post-survey community connectedness scores that were on average 2.71 points lower than participants who identified as heterosexual.
  - Participants who identified not as heterosexual, bisexual, or gay (i.e. “other” sexual orientation) had post-survey Kessler 6 scores that were on average 8.43 points higher (worse mental health) than those who identified as heterosexual.
  - Participants who identified not as heterosexual, bisexual, or gay had mean post-survey distress scores that were on average 3.02 points higher than those who identified as heterosexual.
  - Latinx participants had mean post-survey distress scores that were 2.28 points higher than White participants.
  - Latinx participants had mean post-survey community connectedness scores that were 1.94 points lower than White participants.
  - Youth leadership team participants had mean post-survey distress scores that were 2.82 points lower than those who did not participate in youth leadership teams.
  - Baseline community connectedness is associated with mean post-survey community connectedness. A one-unit increase in baseline community connectedness score is associated with a 0.56 increase in mean community connectedness.
  - Baseline positive self-regard is associated with mean post-survey positive self-regard. A one-unit increase in baseline positive self-regard is associated with a 0.91 increase in positive self-regard in mean positive self-regard.
- Positive self-regard was an average of 1.621 points higher at the post-survey than at the pre-survey ( $p = 0.002$ ) in the group of participants who took their pre-survey fewer than 31 days after beginning the program.
- In the group of participants who took their pre-survey fewer than 31 days after beginning the program, adjusting for the other covariates:
  - Participants who identified as bisexual had mean post-survey positive self-regard scores that were on average 5.78 points lower than participants who identified as heterosexual.
  - Baseline positive self-regard was associated with mean post-survey positive self-regard. A one-unit increase in baseline positive-self regard score was associated with a 0.60 difference in mean post-survey positive self-regard score.
- There were no significant differences in baseline values between those with only a pre-survey and those who completed both a pre and post survey (only  $n = 13$  have pre-survey only;  $n = 52$  have both a pre and post survey).

**Remember again to use caution** when interpreting any of these results. The estimates of change from pre to post that you see in this analysis may not hold up once you have a greater sample size and could easily change substantially in the final version of the analysis of the full program!