2.

a.
b.
c.
d. Name a statistical test that you could use to determine whether errors are higher for some pronouns over others.

Chi-square test of independence is one of the statistical test that can be used to determine whether errors are higher for some pronouns over others. This test can analyze the association between two categorical variables, such as pronouns and translation errors. It compares observed error frequencies with expected frequencies to determine if there is a significant difference in error rates across different pronouns. It can demonstrate whether some pronouns are more prone to errors, but certain conditions must be met, such as independent observations and an acceptable sample size.

e. **Bonus (2 points)**: Compute the statistic you identify in 2.d

Chi-square Statistic: 3.37

f. **Bonus (2 points)**: Describe one potential problem with using the alignment assumption in 2c. How would this problem make it difficult to assess pronoun translation accuracy?

The idea that every pronoun in the source sentence has an exact equivalent in the target sentence is known as the alignment assumption in pronoun translation. However, due to the nuanced and context-dependent nature of pronoun usage and translation decisions, this assumption is frequently broken in actual usage.

When the alignment assumption is broken, it can be difficult to evaluate pronoun translation accuracy effectively. For example, if multiple pronouns in the gold text are translated to a single pronoun in the translated sentence, or vice versa, it is difficult to determine whether this is an accurate translation or not. This is because the mismatched alignment can inflate or deflate the proportions of correct and incorrect pronoun translations.

In conclusion, the alignment assumption is an effective tool for assessing the precision of pronoun translations, but it's crucial to be aware of its limits. It can be challenging to obtain a precise picture of the pronoun translation's correctness when the alignment assumption is violated.