



Associations between non-physical adult mistreatments and adolescent eating disorders

🕒 Created	@July 24, 2023 10:26 PM
🏷️ Tags	Project Python

Project Initiatives

As someone who has witnessed and experienced the adverse impacts of eating disorders during adolescence, I am interested in examining the factors contributing to such development. Therefore, I have chosen the [National Longitudinal Study of Adolescent Health \(AddHealth\)](#) dataset, a representative school-based survey of adolescents in grades 7-12 in the United States.

To begin with, I use the codebook explorer to examine potentially relevant study topics. One thing I recall about the incidences of eating disorders at my school was in most cases parents were the last to be aware of the students' health conditions, after peers, teachers, and school physicians. I then wondered whether tense/unhealthy parent-child relationships could be associated with the development of eating disorders among these students. I was thus inspired to look for topics related to parent-child relationships and child upbringing in the dataset.

After a round of searching, I have narrowed down on "mistreatment by adults", "Parental support and relationship" and "childrearing" to find variables/responses capable of characterizing the negligence and abuse in parent-child relationships. As I read through the survey questions, I decided on the primary topic "*How does parent mistreatment associate with the development of eating disorders in adolescents*", and subsequently found examining negligence and verbal abuse particularly interesting to me: Because negligent supervision and verbal abuse are arguably forms of parent mistreatment with less perceptible evidence and could be easily overlooked by other adults in support roles such as teachers and physicians, and even downplayed by the patients themselves. My secondary topic would examine "*the associations between negligent supervision and verbal abuse and the development of eating disorders in adolescents of different genders.*"

Due to the nature of survey questions, I have extended parent mistreatment to include caregivers in the case that parties other than parents are designated to look after the children.

Research Topic

Primary topic: How does parent/caregiver mistreatment associate with the development of eating disorders in adolescents?

Secondary topic: In particular, I want to examine the associations between negligent supervision and verbal abuse and the development of eating disorders in adolescents of different genders.

Hypothesis: Receiving mistreatment from parents/caregivers is associated with the development of eating disorders in adolescents.

For specific variables, the followings are associated with the development of eating disorders/stress eating patterns in the adolescent:

Higher frequency of hearing parents/adult caregivers saying things that really hurt the adolescent's feelings, make them feel like they are not wanted or loved

Hearing the above sayings from parents/adult caregivers at *earlier ages*

Higher frequency of parents/adult caregivers not taking care of the adolescent's basic needs

Higher frequency of parents/adult caregivers leaving the adolescent unattended at home when parents/adult caregivers should be present

Less number of hours parents/adult caregivers spent taking care of the adolescent at home

The degree/direction of associations could be different for males v.s. females

Datasets and codebooks

[What is a codebook?](#)

Original Codebook: [Add Health](#) >> Wave IV In-Home Interview Data

Variable selections and custom codebook:

Demographics:

Respondent's age and gender

Related to verbal abuse:

<u>H4MA1</u>	Before your 18th birthday, how often did a parent or other adult caregiver say things that really hurt your feelings or made you feel like you were not wanted or loved?
<u>H4MA2</u>	How old were you the first time a parent or other adult caregiver said things that really hurt your feelings or made you feel like you were not wanted or loved?

Related to negligence:

<u>H3MA2</u>	How often had your parents or other adult care-givers not taken care of your basic needs, such as keeping you clean or providing food or clothing?
<u>H3MAC8</u>	How often have you not taken care of your {CHILD/CHILDREN}'s basic needs, such as keeping {HIM/HER/THEM} clean or providing food or clothing?
<u>H3MAC7</u>	How often have you left your {CHILD/CHILDREN} home alone, even when an adult should have been with {HIM/HER/THEM}?
<u>H3MA1</u>	By the time you started 6th grade, how often had your parents or other adult care-givers left you home alone when an adult should have been with you?
<u>H3DA20</u>	On the average, how many hours per week do you spend taking care of the children in your household?

Related to eating disorders:

H3GH8	Have you ever been told by a doctor that you have an eating disorder, such as anorexia nervosa or bulimia?
H3GH7	In the past seven days, have you been afraid to start eating because you thought you wouldn't be able to stop or control your eating?

Literature Reviews

Search terms: Neglect, verbal abuse, eating disorder, adolescent, basic needs, allowance, male, gender difference, young adults.

Summary of findings:

According to Dr. Gregory Jantz (2014), As one of the “most basic yet overlooked forms of abuse”, *verbal abuse* can harm more than childrens’ feelings, spreading the seeds of self-doubt and insecurity that could grow well into the children’s adulthood and cause them to have long-term negative self-image, a risk factor for *eating disorders* (Forsén Mantilla et al., 2014).

In a systematic review on *childhood maltreatment* and eating disorders, a high proportion of adults with *eating disorders or eating-disordered behaviors* reported experiences of *child emotional abuse* and *emotional neglects*. (Kimber et al., 2017). Groups with *binge-eating disorders* and/or *night eating* syndromes also have higher self-report rates of experiencing *physical neglects* than the group without eating disorders or related behaviours, as shown in an interview study. (Allison et al., 2007).

In terms of *gender differences* in the associations between nonphysical mistreatments and eating disorders in adolescents, although most studies focus primarily on female groups, a study on eating disorders in young adults (18-26 yr.o.) has found “*insufficient monthly allowance* to be a strong predictor of eating disorders in male students only” (Din et al., 2019).

References:

- Allison, K. C., Grilo, C. M., Masheb, R. M., & Stunkard, A. J. (2007). High self-reported rates of neglect and emotional abuse, by persons with binge eating disorder and night eating syndrome. *Behaviour Research and Therapy*, 45(12), 2874-2883. <https://doi.org/10.1016/j.brat.2007.05.007>
- Din, Z. U., Iqbal, K., Khan, I., Abbas, M., Ghaffar, F., Iqbal, Z., Iqbal, M., Rana, M. I., Suleman, M., & Iqbal, H. (2019). Tendency towards eating disorders and associated sex-specific risk factors among university students. *Archives of Neuropsychiatry*. <https://doi.org/10.29399/npa.23609>
- Forsén Mantilla, E., Bergsten, K., & Birgegård, A. (2014). Self-image and eating disorder symptoms in normal and clinical adolescents. *Eating Behaviors*, 15(1), 125-131. <https://doi.org/10.1016/j.eatbeh.2013.11.008>
- Jantz, G. (2021, October 21). *How the 5 major types of abuse link to eating disorders*. The Center • A Place of HOPE. <https://www.aplaceofhope.com/how-the-5-major-types-of-abuse-link-to-eating-disorders/>
- Kimber, M., McTavish, J. R., Couturier, J., Boven, A., Gill, S., Dimitropoulos, G., & MacMillan, H. L. (2017). Consequences of child emotional abuse, emotional neglect and exposure to intimate partner violence for eating disorders: A systematic critical review. *BMC Psychology*, 5(1). <https://doi.org/10.1186/s40359-017-0202-3>
- Muise, A. M., Stein, D. G., & Arbess, G. (2003). Eating disorders in adolescent boys: A review of the adolescent and young adult literature. *Journal of Adolescent Health*, 33(6), 427-435. [https://doi.org/10.1016/s1054-139x\(03\)00060-0](https://doi.org/10.1016/s1054-139x(03)00060-0)

Data import and cleaning

The [UNC Dataverse](#) uses sas7bdat files (SAS database files) to store data, so I use [pyreadstat](#) and [pandas](#) to convert the files to panda dataframes.

```
!pip install pyreadstat
import pyreadstat
import pandas as pd
...
...
#read in sas database files
w3_df,w3_meta = pyreadstat.read_sas7bdat('Desktop/untitled folder/ds/iii/w3inhome.sas7bdat')
#convert to pd df
w3_raw = pd.DataFrame(w3_df)
#select variables
w3_var = ["AID", "BIO_SEX3", "H3MA2", "H3MA1", "H3GH7", "H3GH8"]
w3 = w3_raw[w3_var]
#recode column names
w3.columns = ["id", "sex", "child_basic_need", "child_left_alone", "binge_eat", "disorders"]
w3.head()
...
...
```

	id	sex	child_basic_need	child_left_alone	binge_eat	disorders
0	57100270	2.0	6.0	6.0	0.0	0.0
1	57101310	2.0	6.0	6.0	0.0	0.0
2	57103869	1.0	6.0	6.0	0.0	0.0
3	57104676	1.0	5.0	3.0	0.0	0.0
4	57109625	1.0	6.0	1.0	0.0	0.0

```
#wave four data, similar opw4_df,w4_meta = pyreadstat.read_sas7bdat('Desktop/untitled folder/ds/iv/w4inhome.sas7bdat')
w4_raw = pd.DataFrame(w4_df)
w4_var = ["AID", "H4MA1", "H4OD1Y"]
w4 = w4_raw[w4_var]
w4.columns = ["id", "cnt_hurts", "birthyear"]
w4.head()
...
...
```

	id	cnt_hurts	birthyear
0	57101310	6.0	1976.0
1	57103869	1.0	1976.0
2	57109625	6.0	1981.0
3	57111071	6.0	1981.0
4	57113943	6.0	1979.0

Merge W3 and W4 data based on respondent id and get rid of NA values:

```
#inner join w3 and 4 by id
w3["id"] = w3["id"].astype(str)
w4["id"] = w4["id"].astype(str)
df = pd.merge(w3,w4, on="id", how='inner')
df = df.dropna()
```

Data management and exploratory analysis

A brief look at the frequency distribution of each vars. Through this part some of the previously selected variables were excluded because more than half of the respondents either responded don't know, refuse to answer, or that the question

was skipped or not applicable. Specifically, the parent side of the questions about childrearing, like “How often have you not taken care of your {CHILD/CHILDREN}'s basic needs, such as keeping {HIM/HER/THEM} clean or providing food or clothing?” were often marked ‘legitimate skips’ or ‘not applicable’ because the parent did not live with the child, and the child was supervised by other adult caregivers.

The remaining variables are further cleaned to discard *don't know, n/a, refuse to answer, not asked* responses.

To avoid confusions, higher quantities/frequencies are given higher variable values, so 0 marks no such experience for the numeric variables as well as whether the respondent had been informed they had eating disorders. In particular, three variables (whether parent had neglected basic needs, left the respondent alone, said something hurtful) originally used 6 to represent no such experience and were thus replaced.

```
#exclude don't know, n/a, refuse to answer, not asked
filt1 = list(df.columns)
filt1.remove("id")
filt1.remove("birthyear")
for c in filt1:
    df = df[df[c] < 8]
    print(c, " ", df.shape)
df = df.replace(6,0)
```

```
sex      (4206, 8)
child_basic_need  (4019, 8)
child_left_alone  (3851, 8)
binge_eat  (3848, 8)
disorders  (3846, 8)
cnt_hurts  (3796, 8)
```

The *disorders* and *binge_eat* variables are combined to make a secondary variable *eat_disorder*, a categorical variable that characterizes whether the respondents had eating-disordered behaviors, or had been informed by doctors of having some forms of eating disorders.

```
df["eat_disorder"] = df["disorders"].astype(bool) | df["binge_eat"].astype(bool)
df["eat_disorder"] = df["eat_disorder"].astype(int)
df.drop(["binge_eat", "disorders"], inplace=True, axis=1)
```

```
for var in df.columns[1:]:
    print(df[var].value_counts(sort=False), '\n')
```

```
2.0    2144
1.0    1652
Name: sex, dtype: int64

0.0    3401
2.0     66
5.0     96
1.0    154
3.0     47
4.0     32
Name: child_basic_need, dtype: int64

0.0    2310
2.0    362
5.0    295
1.0    449
3.0    286
4.0     94
Name: child_left_alone, dtype: int64
```

```

0.0    2026
2.0    362
5.0    461
1.0    396
3.0    382
4.0    169
Name: cnt_hurts, dtype: int64

1978.0    652
1981.0    558
1982.0    377
1975.0     27
1976.0    214
1974.0      5
1979.0    664
1983.0      3
1980.0    672
1977.0    624
Name: birthyear, dtype: int64

0    3627
1    169
Name: eat_disorder, dtype: int64

```

Original name	Encoded name	Explanation	Property
H3MA1	child_basic_need	how often had the respondent's parent/adult caregiver not cover their basic needs	quantitative (discrete)
H3MA2	child_left_alone	how often had the respondent's parent/adult caregiver leave the child at home irresponsibly	quantitative (discrete)
H3GH7 H3GH8 or combined	eat_disorder	had the respondent been told by doctors they had some form of eating disorder, or had the respondent feared they would not be able to stop eating once they started in the past week	categorical, 1 = yes, 0 = no
BIO_SEX3	sex	sex of the respondent	categorical, 1 = male, 2 = female
AID	id	respondent identification number	unique identifier
H4MA1	cnt_hurts	how many times had the parent/adult caregiver said harmful things to the respondent before they turned 18	quantitative (discrete)
H4OD1Y	birthyear	year of birth of the respondent	date/time

Using the [seaborn](#) library, the differences in the responses of male and female respondents could be visualized by density plots.

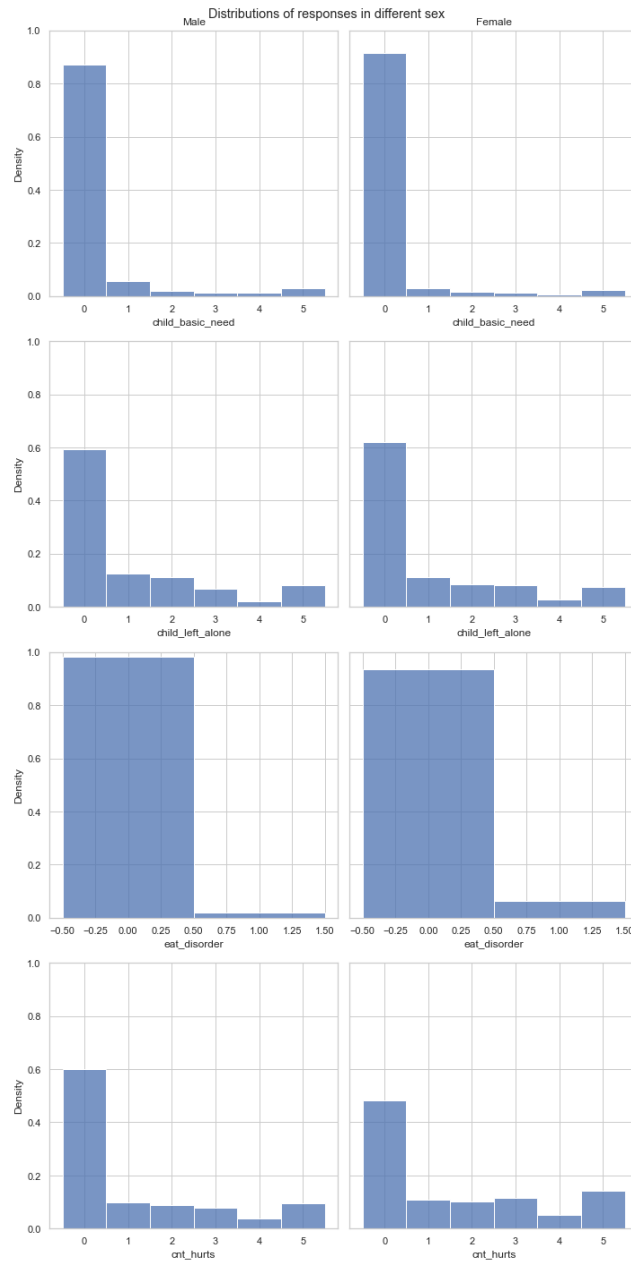
Univariate graphs

```

import seaborn as sns
from matplotlib import pyplot as plt
sns.set_theme(style="whitegrid")
df["sex"] = df["sex"].map({1:"male", 2:"female"})
var = ['child_basic_need', 'child_left_alone', 'eat_disorder', 'cnt_hurts']
#define grid
fig, ax = plt.subplots(len(var), 2, figsize=(10, 20), tight_layout=True, sharey=True)
for c in range(len(var)):
    sns.histplot(df[df["sex"]=="male"], x=var[c], discrete=True, stat="density", ax=ax[c, 0])
    sns.histplot(df[df["sex"]=="female"], x=var[c], discrete=True, stat="density", ax=ax[c, 1])
    ax[c, 0].set_ylim([0, 1])
    ax[0, 0].set_title("Male")

```

```
ax[0,1].set_title("Female")
fig.suptitle("Distributions of responses in different sex")
```



Preliminary interpretations

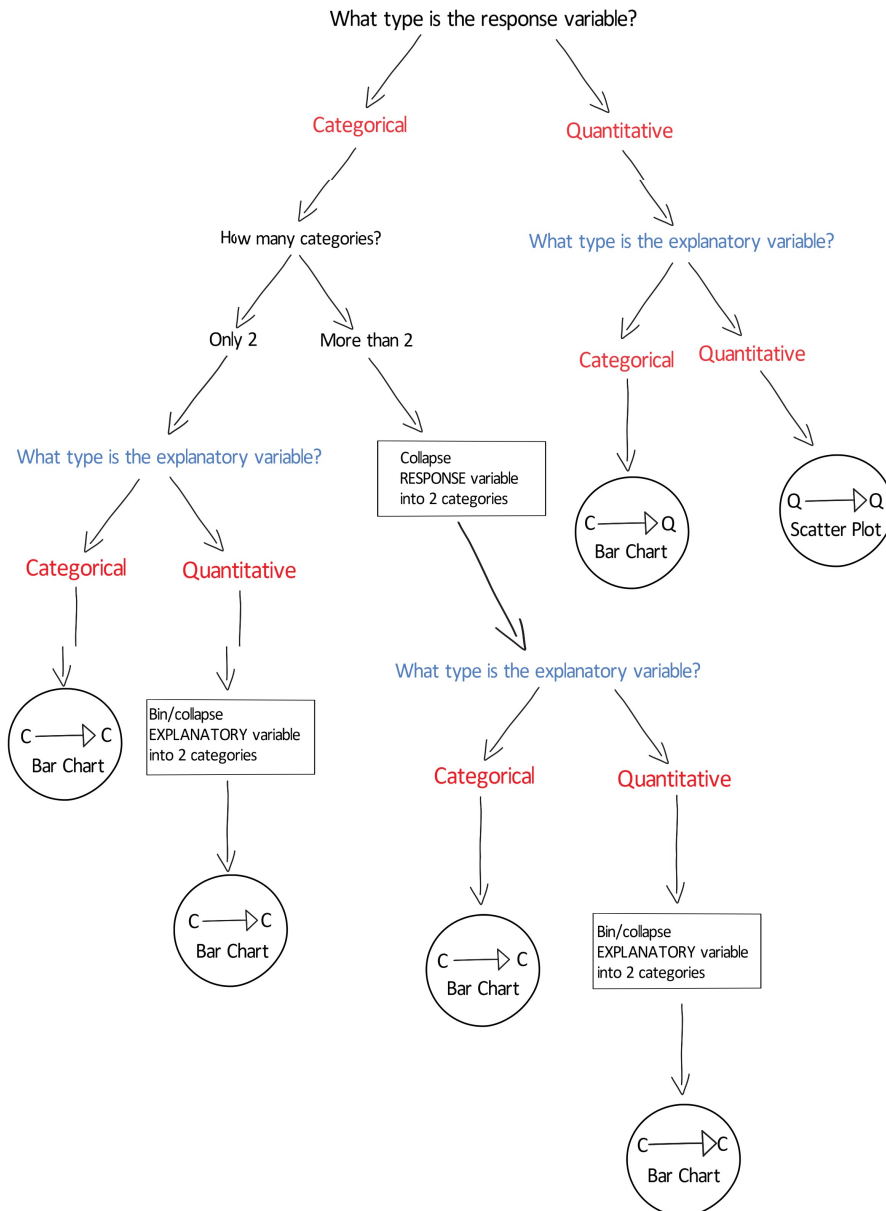
More than 80% of the male respondents reported that their parents/adult caregivers had never neglected to take care of their basic needs, while more than 90% of the female respondents claimed so. Around 60% of both male and female respondents claimed that their parents/adult caregivers had never left them home alone irresponsibly, and the proportion is slightly higher in females.

In terms of fear of binge eating behaviors and eating disorders, the reported incidence rates were higher in female respondents. Although the total cases for both were below 100.

Female respondents reported high occurrences of hearing something that hurt their feelings, made them feel undesired or unloved from parents/adult caregivers than male respondents. About 60% of male respondents claimed no such experience, while the proportion was below 50% for female respondents. Additionally, the experience of hearing such sayings for more than 10 times in the past was slightly more prevalent in female respondents than males.

Visualization of associations

Tying back to the research questions and hypothesis, and with the helpful flow chart provided by the [data management and visualization course](#), we further examine the correlations between different pairs of variables by designating response and explanatory variables.



The *child_basic_need*, *child_left_alone*, and *cnt_hurts* variables which are counts of events are further collapsed into four groups: 0, 1-5 times, 6-10 times, more than 10 times and recoded as 0, 3, 8, 11.

```
for cnt in ["child_left_alone", "child_basic_need", "cnt_hurts"]:
    df[cnt] = df[cnt].map({0:0, 3:8, 4:8, 5:11, 1:3, 2:3})
df.head()
for var in df.columns[1:]:
    print(df[var].value_counts(sort=False), '\n')
```

```
2.0    2144
1.0    1652
Name: sex, dtype: int64

0     3401
8       79
3       220
11       96
Name: child_basic_need, dtype: int64

0     2310
8       380
3       811
11       295
Name: child_left_alone, dtype: int64

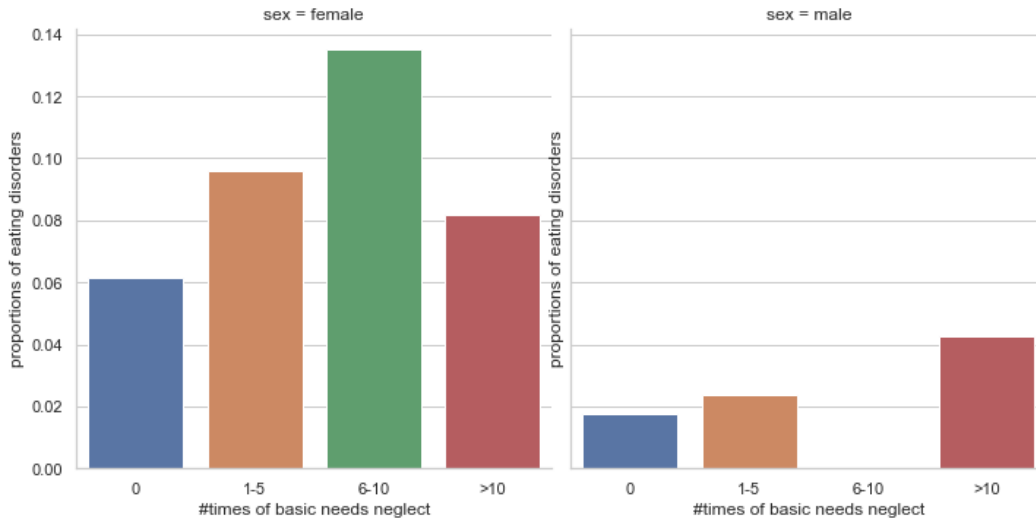
0     2026
8       551
3       758
11       461
Name: cnt_hurts, dtype: int64

1978.0    652
1981.0    558
1982.0    377
1975.0     27
1976.0    214
1974.0     5
1979.0    664
1983.0     3
1980.0    672
1977.0    624
Name: birthyear, dtype: int64

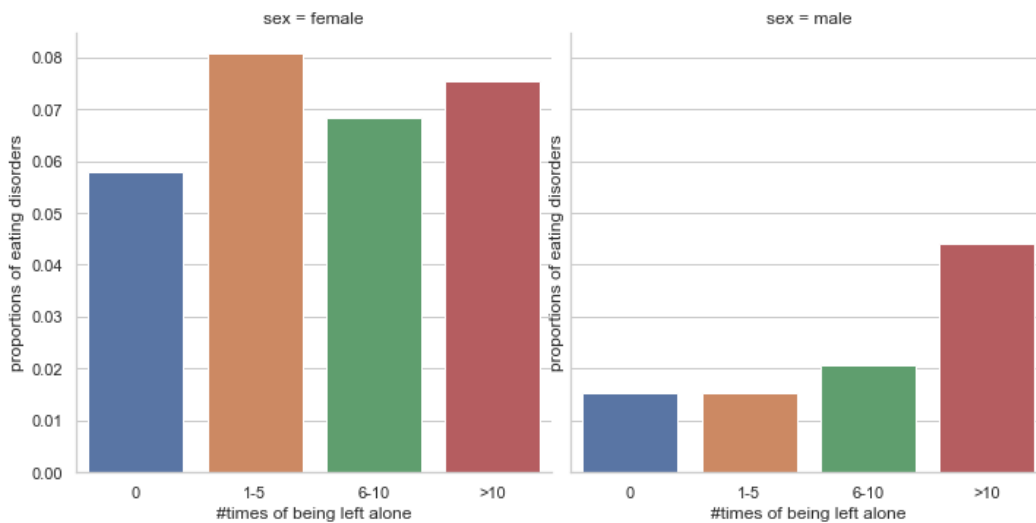
0     3627
1     169
Name: eat_disorder, dtype: int64
```

The response variables would be whether the respondent reported eating disorders (*eat_disorder*) which is categorical, and the explanatory variables would be number of times of neglecting basic needs (*child_basic_needs*), number of times of leaving respondent alone irresponsibly (*child_left_alone*), and the number of times the respondent receiving verbal abuse from parent/adult caregiver (*cnt_hurts*), all quantitative. Thus, it would be most reasonable to plot another set of grouped bar charts/hist plots.

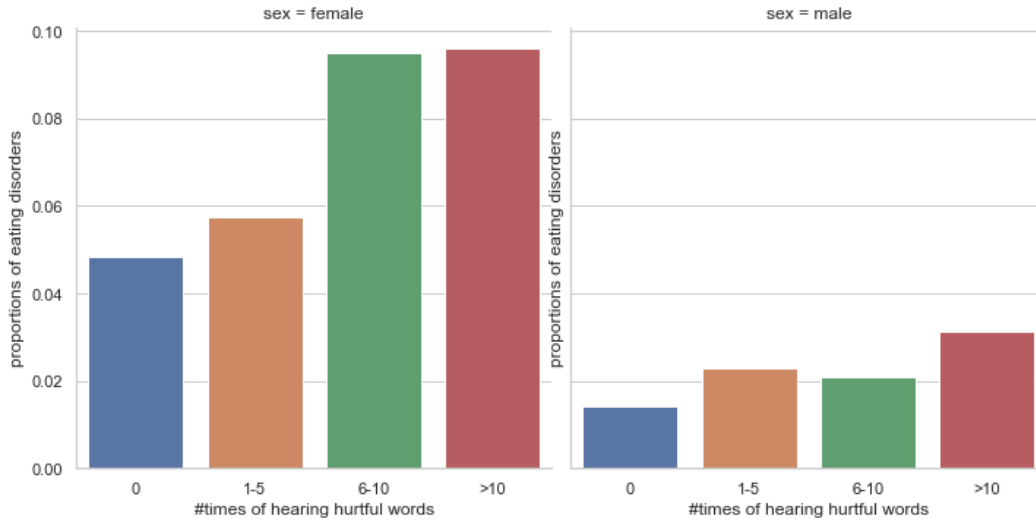
```
varname = ["#times of basic needs neglect", "#times of being left alone", "#times of hearing hurtful words"]
for c in range(len(var)):
    df[var[c]] = df[var[c]].astype("category")
    df[var[c]] = df[var[c]].cat.rename_categories(["0", "1-5", "6-10", ">10"])
    g = sns.catplot(data=df, x=var[c], y="eat_disorder", kind="bar", col="sex", ci=None)
    g.set(ylabel="proportions of eating disorders", xlabel=varname[c])
```



For female respondents, the graph is unimodal with peak at the category of reporting experiences of adult/care giver neglecting their basic needs between 6-10 times. For male respondents, one category is missing but the peak seems to be at the category of reporting more than 10 times of being neglected basic needs.



For female respondents, the graph is bimodal although not very significant, with peaks at the category of reporting experiences of adult/care giver leaving them at home alone irresponsibly between 1-5 times and more than 10 times. For male respondents, the graph is unimodal and left-skewed, peak at the more than 10 times category.



For both male and female respondents, the graphs are almost unimodal and left-skewed, with peaks at the category of reporting experiences of hearing receiving verbal abuses for more than 10 times before they turned 18.

Conclude

Comparing males and female respondents, the overall proportions of having eating disorders are much lower in males than females for the same categories, i.e., for groups reporting the same number of times of non-physical adult mistreatments, including being neglected basic needs, being left alone at home irresponsibly, and receiving verbal abuses before turning 18. The general trend is that the number of times the respondent received non-physical mistreatments from adult caregiver/parent is positively correlated with the development of eating disorders, or eating-disordered behaviors.