In [15]:
```
import csv
import time
import pandas as pd
import string

from nltk.corpus import stopwords

import numpy as np
import nltk
import matplotlib.pyplot as plt
import seaborn as sns
sns.set(style='darkgrid', context='talk', palette='Dark2')

import re
from collections import Counter
from string import punctuation

from wordcloud import WordCloud

from textblob import TextBlob

pd.set_option('display.max_colwidth', None)
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)
```

Analysis of Reddit Posts

In [16]:
```
df = pd.read_csv('Reddit_data.csv', lineterminator='\n')

df.head()
```

```
/Users/chuyuchen/miniforge3/lib/python3.9/site-packages/IPython/core/interactive
shell.py:3444: DtypeWarning: Columns (10) have mixed types.Specify dtype option
on import or set low_memory=False.
  exec(code_obj, self.user_global_ns, self.user_ns)
```

Out[16]:

	created_utc	ups	subreddit_id	link_id	name	score_hidden	author_flair_css_class
0	1430438400	4	t5_378oi	t3_34di91	t1_cqug90g	0	NaN
1	1430438400	4	t5_2qo4s	t3_34g8mx	t1_cqug90h	0	Heat

	created_utc	ups	subreddit_id	link_id	name	score_hidden	author_flair_css_class
2	1430438400	0	t5_2cneq	t3_34f7mc	t1_cqug90i	0	NaN
3	1430438400	3	t5_2qh1i	t3_34f9rh	t1_cqug90j	0	NaN
4	1430438400	3	t5_2qh1i	t3_34fvry	t1_cqug90k	0	NaN

In [17]:
```
df.shape
```

Out[17]:
```
(28883304, 22)
```

In [18]:
```
df = df.drop_duplicates('body')
df.shape
```

Out[18]:
```
(25622841, 22)
```

In [19]:
```
df.head(5)
```

Out[19]:

	created_utc	ups	subreddit_id	link_id	name	score_hidden	author_flair_css_class

	created_utc	ups	subreddit_id	link_id	name	score_hidden	author_flair_css_class
0	1430438400	4	t5_378oi	t3_34di91	t1_cqug90g	0	NaN
1	1430438400	4	t5_2qo4s	t3_34g8mx	t1_cqug90h	0	Heat
2	1430438400	0	t5_2cneq	t3_34f7mc	t1_cqug90i	0	NaN
3	1430438400	3	t5_2qh1i	t3_34f9rh	t1_cqug90j	0	NaN
4	1430438400	3	t5_2qh1i	t3_34fvry	t1_cqug90k	0	NaN

In [20]:
```
df = df.filter(['id','subreddit','created_utc','downs','ups','score','body'], ax
df.head(5)
```

Out[20]:

	id	subreddit	created_utc	downs	ups	score	body
0	cqug90g	soccer_jp	1430438400	0	4	4	くそ\n読みたいが買ったら負けな気がする\n図書館に出ねーかな

	id	subreddit	created_utc	downs	ups	score	body
1	cqug90h	nba	1430438400	0	4	4	gg this one's over. off to watch the NFL draft I guess
2	cqug90i	politics	1430438400	0	0	0	Are you really implying we return to those times or anywhere near that political environment? If so, you won't have much luck selling the American people on that governance concept without ushering in American Revolution 2.0.
3	cqug90j	AskReddit	1430438400	0	3	3	No one has a European accent either because it doesn't exist. There are accents from Europe but not a European accent.
4	cqug90k	AskReddit	1430438400	0	3	3	That the kid "..reminds me of Kevin." so sad :-(

In [21]:
```
top_10_reddit = ['AskReddit', 'leagueoflegends','nba','funny','nfl','pics','vide
```

In [22]:
```
df1 = df[df['subreddit'].isin(top_10_reddit)]
df1.head(5)
```

Out[22]:

	id	subreddit	created_utc	downs	ups	score	body
1	cqug90h	nba	1430438400	0	4	4	gg this one's over. off to watch the NFL draft I guess
3	cqug90j	AskReddit	1430438400	0	3	3	No one has a European accent either because it doesn't exist. There are accents from Europe but not a European accent.
4	cqug90k	AskReddit	1430438400	0	3	3	That the kid "..reminds me of Kevin." so sad :-(
19	cqug90z	AskReddit	1430438400	0	5	5	NSFL
22	cqug912	todayilearned	1430438401	0	0	0	Get back to your pott harry.

In [23]:
```
df1.shape
```

Out[23]:
```
(4864688, 7)
```

In [24]:
```
df1 = df1.filter(['id','subreddit','created_utc','downs','ups','score','body'],
df1.head()
```

Out[24]:

	id	subreddit	created_utc	downs	ups	score	body
1	cqug90h	nba	1430438400	0	4	4	gg this one's over. off to watch the NFL draft I guess

	id	subreddit	created_utc	downs	ups	score	body
3	cqug90j	AskReddit	1430438400	0	3	3	No one has a European accent either because it doesn't exist. There are accents from Europe but not a European accent.
4	cqug90k	AskReddit	1430438400	0	3	3	That the kid "..reminds me of Kevin." so sad :-(
19	cqug90z	AskReddit	1430438400	0	5	5	NSFL
22	cqug912	todayilearned	1430438401	0	0	0	Get back to your pott harry.

Data Cleaning

In [35]:

```
# helper function to clean comments
def processComment(comment):
    # Remove HTML special entities (e.g. &amp;)
    comment = re.sub(r'\&\w*;', '', str(comment))
    #Convert @username to AT_USER
    comment = re.sub('@[^\s]+','', comment)
    # Remove tickers
    comment = re.sub(r'\$\w*', '', comment)
    # To lowercase
    comment = comment.lower()
    # Remove hyperlinks
    comment = re.sub(r'https?:\/\/.*\/\w*', '', comment)
    # Remove hashtags
    comment = re.sub(r'#\w*', '', comment)
    # Remove Punctuation and split 's, 't, 've with a space for filter
    comment = re.sub(r'[' + punctuation.replace('@', '') + ']+', ' ', comment)
    # Remove words with 2 or fewer letters
    comment = re.sub(r'\b\w{1,2}\b', '', comment)
    # Remove whitespace (including new line characters)
    comment = re.sub(r'\s\s+', ' ', comment)
    # Remove single space remaining at the front of the comment.
    comment = tweet.lstrip('')
    # Remove characters beyond Basic Multilingual Plane (BMP) of Unicode:
    comment = ''.join(c for c in comment if c <= '\uffff')
    return comment
#

df1['clean_comment'] = df1['body'].apply(processComment)
df1[['body','clean_comment']].head()
```

Out[35]:

	body	clean_comment
1	gg this one's over. off to watch the NFL draft I guess	this one over off watch the nfl draft guess
3	No one has a European accent either because it doesn't exist. There are accents from Europe but not a European accent.	one has european accent either because doesn exist there are accents from europe but not european accent
4	That the kid "..reminds me of Kevin." so sad :-(	that the kid reminds kevin sad
19	NSFL	nsfl
22	Get back to your pott harry.	get back your pott harry

Sentiment Categorizing

In [36]:
```
def analyze_sentiment(tweet):
    analysis = TextBlob(tweet)

    if analysis.sentiment.polarity > 0:
        return 1
    elif analysis.sentiment.polarity == 0:
        return 0
    else:
        return -1


df1['category'] = df1['clean_comment'].apply(analyze_sentiment)
df1[['body','clean_comment','category']].head()
```

Out[36]:

	body	clean_comment	category
1	gg this one's over. off to watch the NFL draft I guess	this one over off watch the nfl draft guess	0
3	No one has a European accent either because it doesn't exist. There are accents from Europe but not a European accent.	one has european accent either because doesn exist there are accents from europe but not european accent	0
4	That the kid "..reminds me of Kevin." so sad :-(	that the kid reminds kevin sad	-1
19	NSFL	nsfl	0
22	Get back to your pott harry.	get back your pott harry	0

In [14]:
```
df1.to_csv('data_cleaned.csv', index=False)
```

Visualization of Sentiment

In [28]:
```
# check the number of positive vs. negative tagged sentences
positives = df1['category'][df1.category == 1]
negatives = df1['category'][df1.category == -1]
neutrals = df1['category'][df1.category == 0]


print('number of positve categorized text is:  {}'.format(len(positives)))
print('number of negative categorized text is: {}'.format(len(negatives)))
print('number of neutral categorized text is: {}'.format(len(neutrals)))
print('total length of the data is:            {}'.format(df1.shape[0]))
```

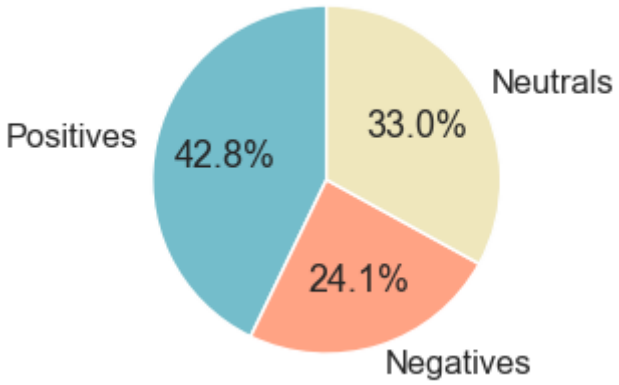
```
number of positve categorized text is:  2083852
number of negative categorized text is: 1174577
number of neutral categorized text is: 1606259
total length of the data is:            4864688
```

In [33]:
```
#import matplotlib.pyplot as plt

slices_len = [len(positives), len(negatives), len(neutrals)]
category = ['Positives', 'Negatives', 'Neutrals']
```

```
colors = ['#74BDCB', '#FFA384', '#EFE7BC']

plt.pie(slices_len, labels=category, colors=colors, startangle=90, autopct='%.1f
plt.show()
```



In [ ]: