

## Plot Word Shifts

```
In []:import matplotlib as mpl
mpl.rcParams.update(mpl.rcParamsDefault)

extension = '/Users/patrick/Documents/csys303_assignments/violent_crimes_analysis/data/nlp/txt/'
list_txt = os.listdir(extension)
pairwise_txts = itertools.combinations(list_txt, 2)

for i in pairwise_txts:
    first_txt: str = f'{extension}{i[0]}'
    second_txt: str = f'{extension}{i[1]}''

    print('Sample 1:')
    first_wf, first_ng = get_word_freq(first_txt)
    first_ts_df = gen_ts_df(first_txt)

    print('\nSample 2:')
    second_wf, second_ng = get_word_freq(second_txt)
    second_ts_df = gen_ts_df(second_txt)

    first_wf_dict = {i[0] : int(i[1]) for i in zip(first_wf[0,:], first_wf[1,:])}
    second_wf_dict = {i[0] : int(i[1]) for i in zip(second_wf[0,:], second_wf[1,:])}

    args = gen_shift_args(
        first_wf_dict,
        second_wf_dict,
        set_ref = True,
        lens=[(4,6)],
        source = first_txt
    )

    source = args['entropy_shift'].pop('source')
    source = args['weighted_average'].pop('source')

    fig = plt.figure(1, figsize = (15,10), layout = 'tight')

    sent_shift_was = sh.WeightedAvgShift(**args['weighted_average'])

    sent_shift_ent = sh.EntropyShift(**args['entropy_shift'])

    ax1 = fig.add_subplot(121)
    sent_shift_was.get_shift_graph(
        ax = ax1,
        detailed = False,
        show_plot = False,
        text_size_inset = False,
        cumulative_inset = False,
        system_names = ['Sample 1', 'Sample 2'])

    ax2 = fig.add_subplot(122)
    sent_shift_ent.get_shift_graph(
        ax = ax2,
        detailed = False,
        show_plot = False,
        text_size_inset = False,
        cumulative_inset = False,
        system_names = ['Sample 1', 'Sample 2'])

    fig.suptitle('Weighted Average vs. Entropy Shifts\nLens: [4, 6]',
                 fontsize = 20,
                 x = 0.5,
                 y = 1.025)

plt.show()
```

Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

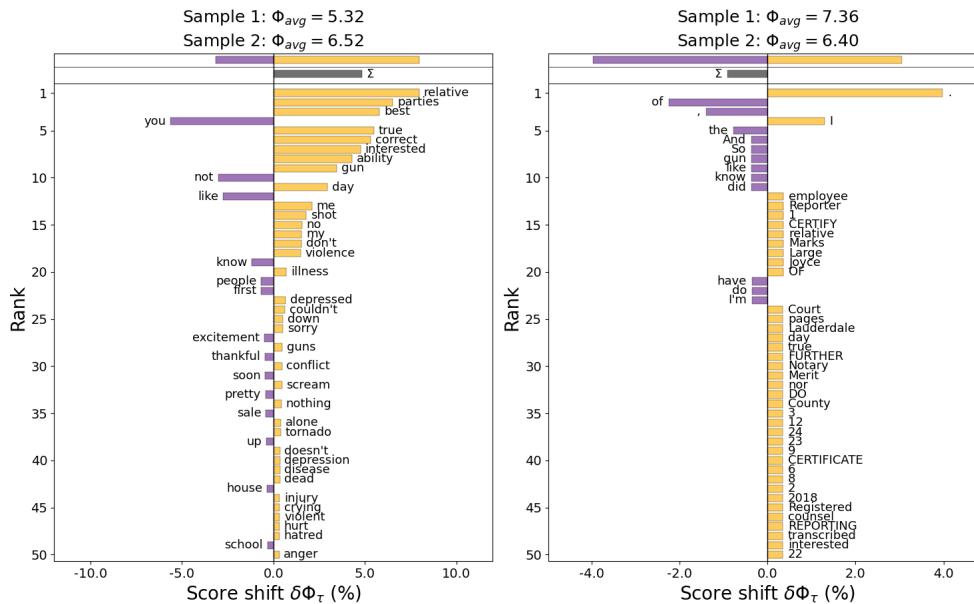
Total n-grams: 170

Total unique n-grams: 111

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

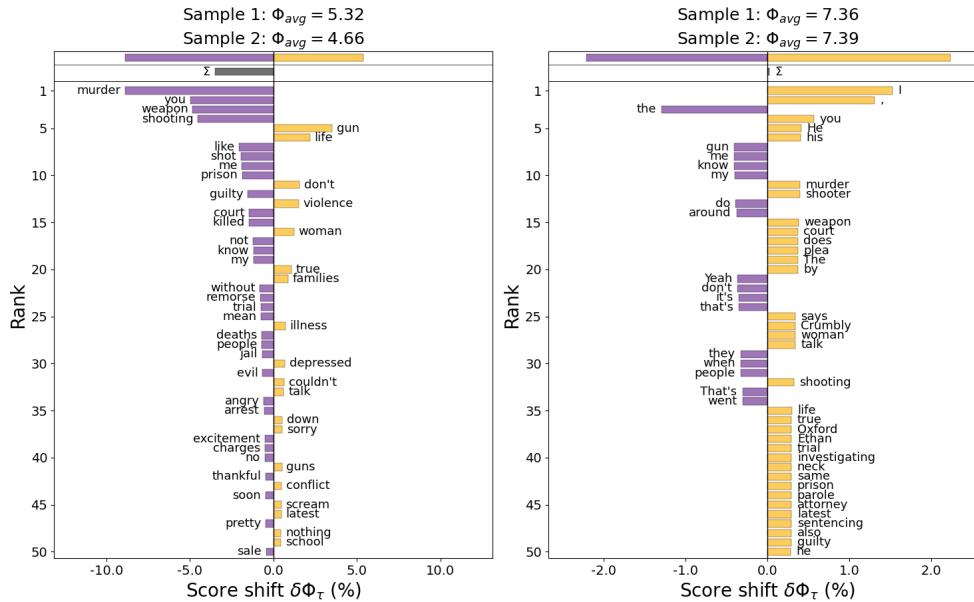
Total n-grams: 925

Total unique n-grams: 339

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

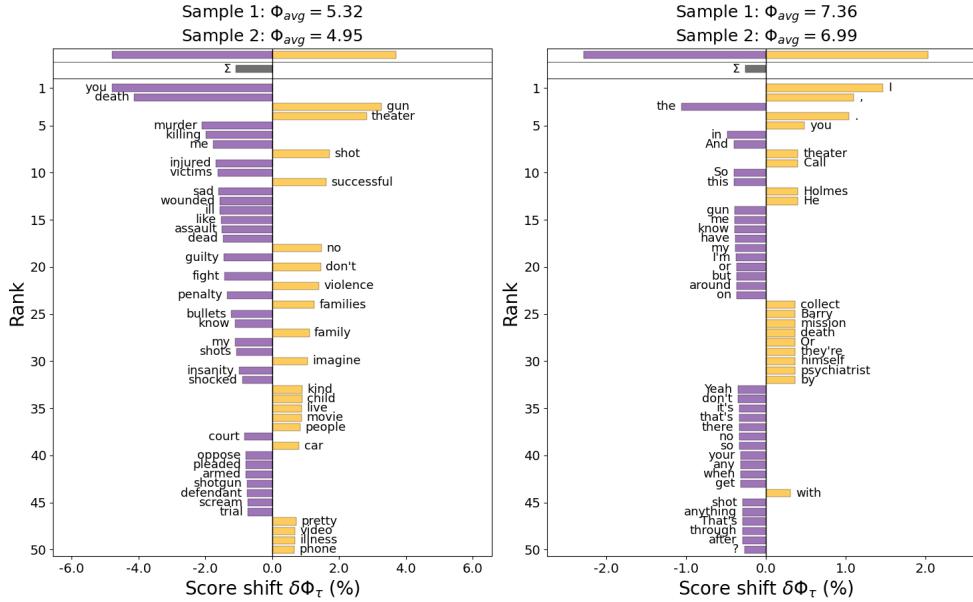
Total n-grams: 358

Total unique n-grams: 201

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

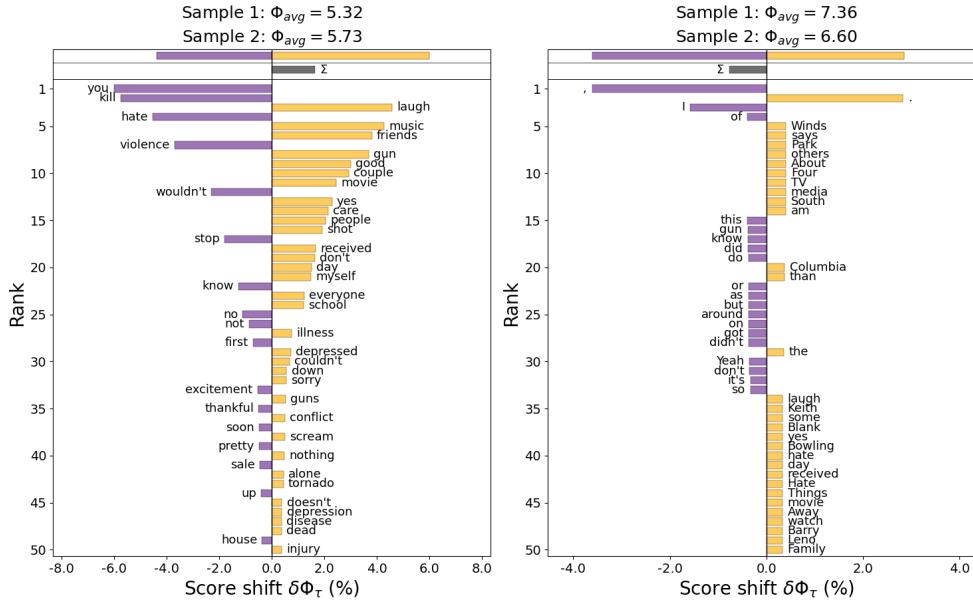
Total n-grams: 223

Total unique n-grams: 143

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

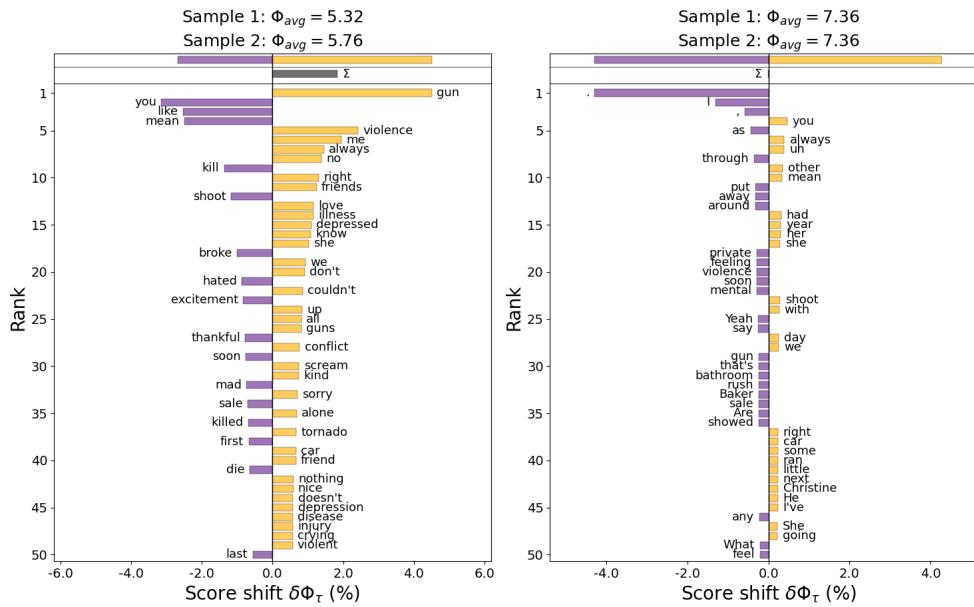
Total n-grams: 3,063

Total unique n-grams: 641

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

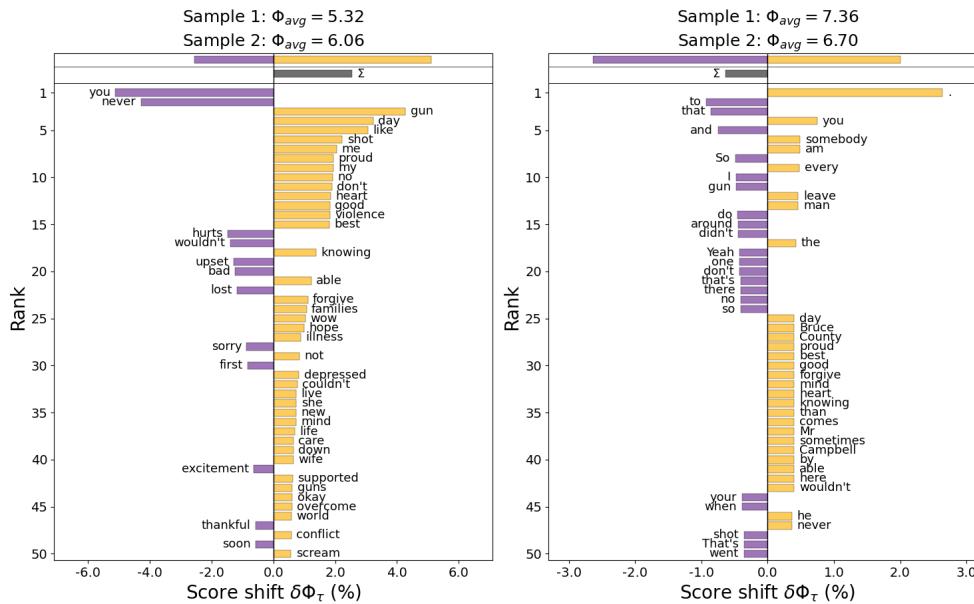
Total n-grams: 445

Total unique n-grams: 175

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

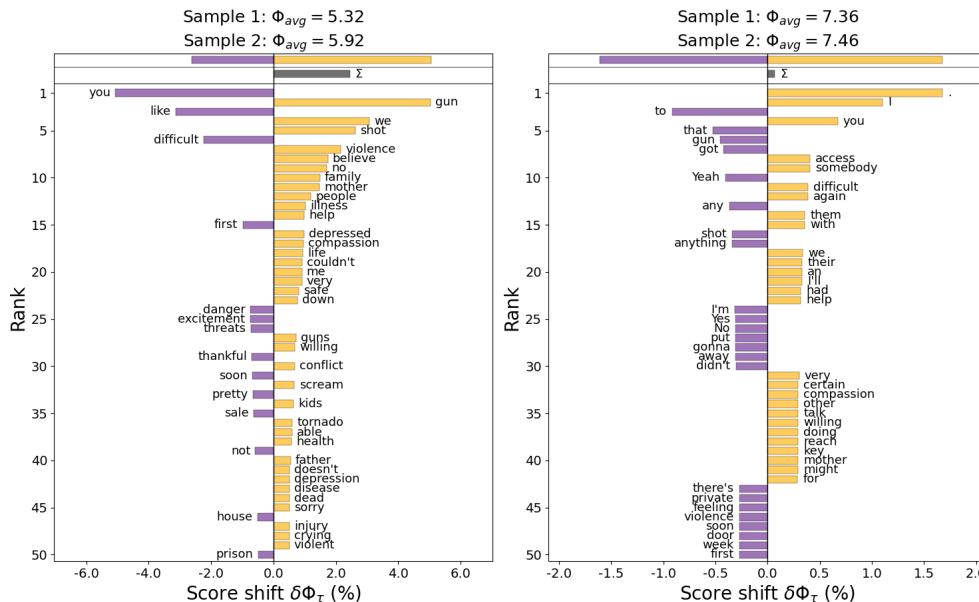
Total n-grams: 1,509

Total unique n-grams: 415

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

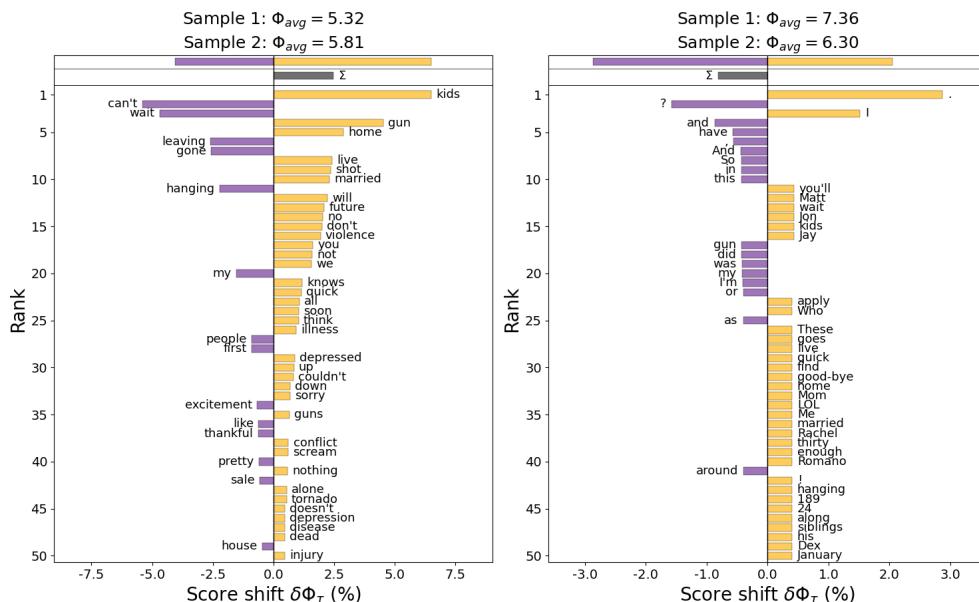
Total n-grams: 172

Total unique n-grams: 104

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



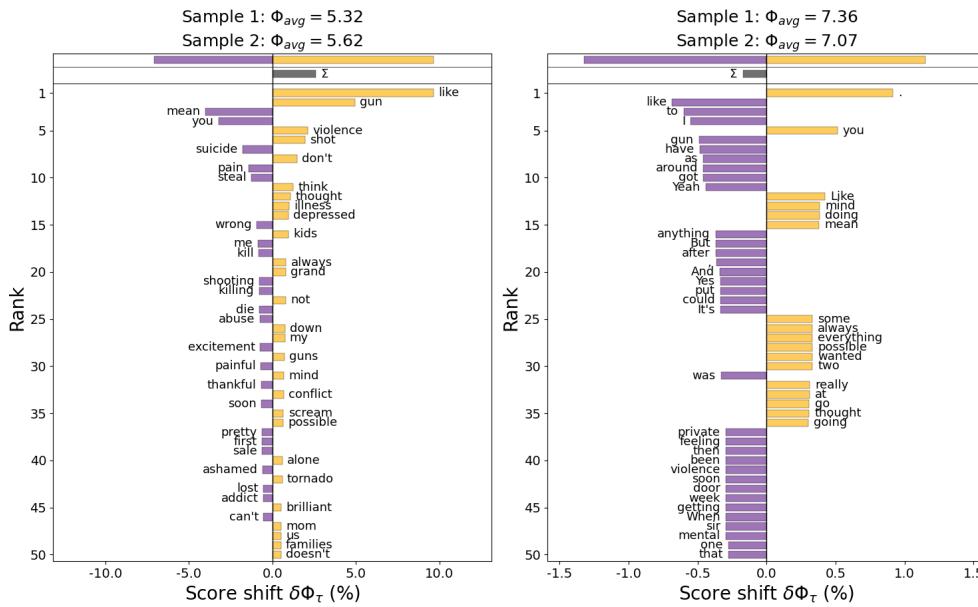
Sample 1:

Total n-grams: 1,720  
Total unique n-grams: 453

Sample 2:

Total n-grams: 1,051  
Total unique n-grams: 320  
Lensing Window: [4, 6]  
Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



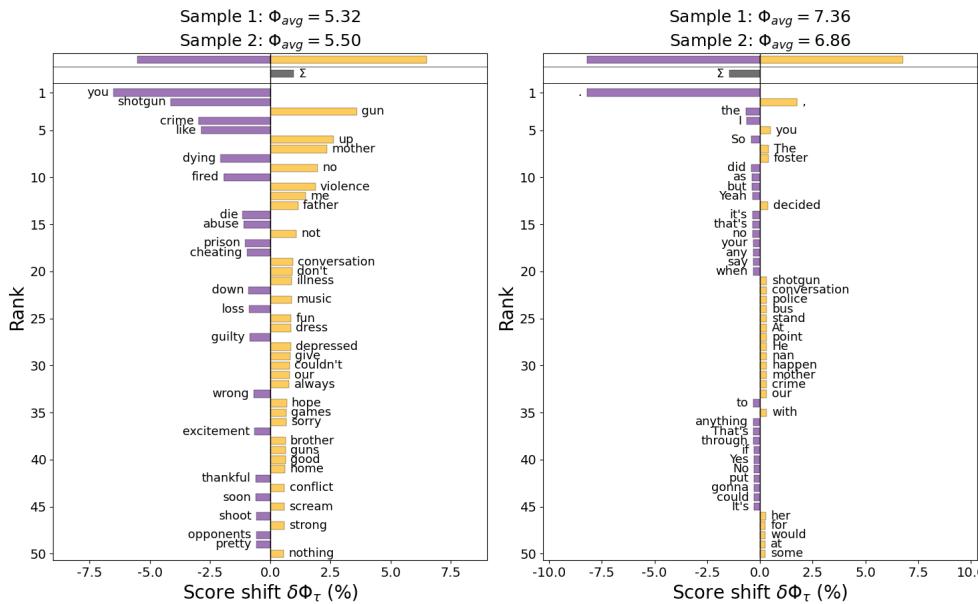
Sample 1:

Total n-grams: 1,720  
Total unique n-grams: 453

Sample 2:

Total n-grams: 787  
Total unique n-grams: 300  
Lensing Window: [4, 6]  
Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

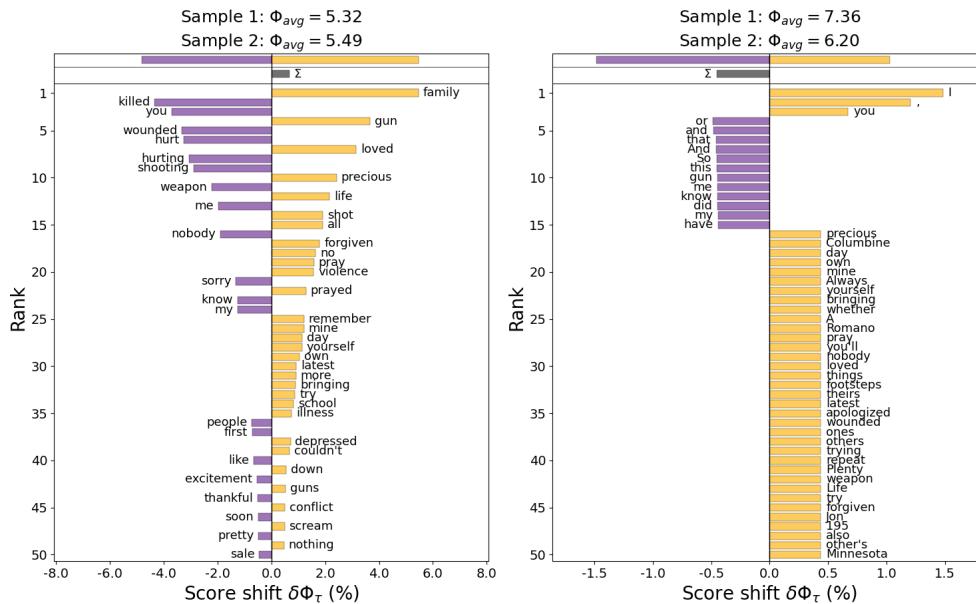
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,720

Total unique n-grams: 453

Sample 2:

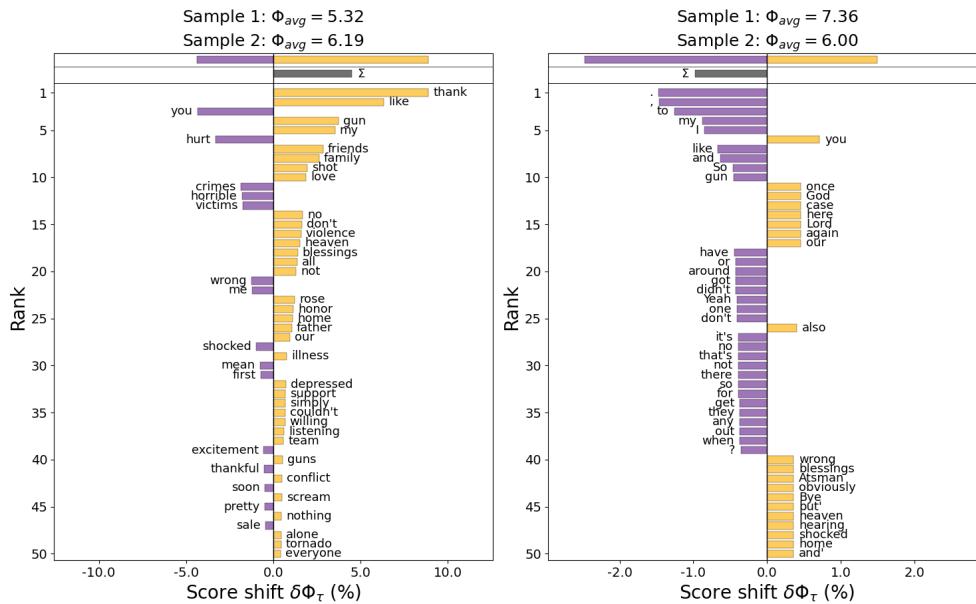
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.264

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]

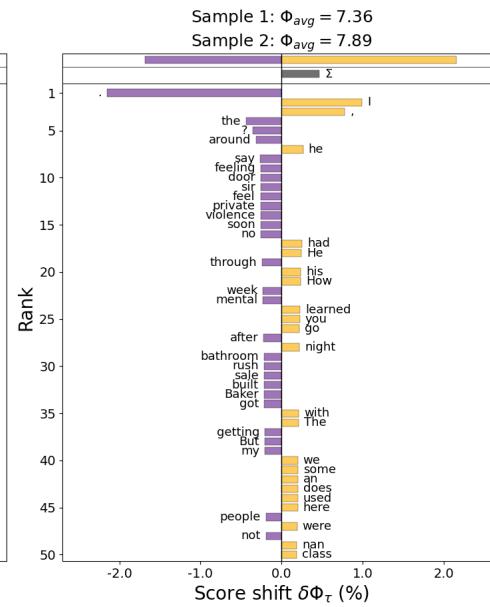
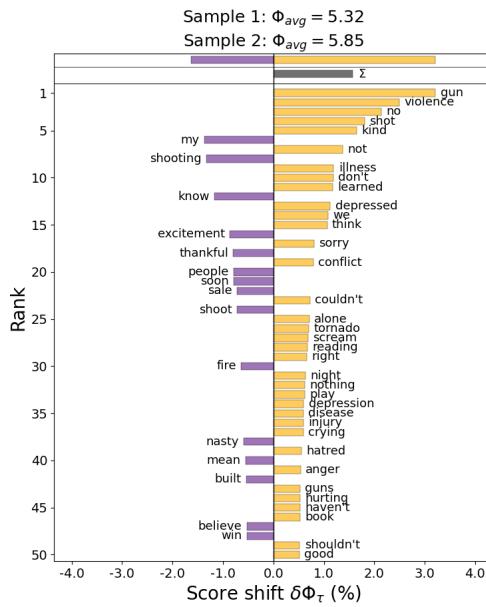
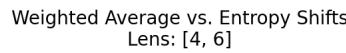


### Sample 1:

Total n-grams: 1,720  
Total unique n-grams: 453

## Sample 2:

Total n-grams: 8,551  
Total unique n-grams: 1,314  
Lensing Window: [4, 6]  
Reference Happiness: 5.264

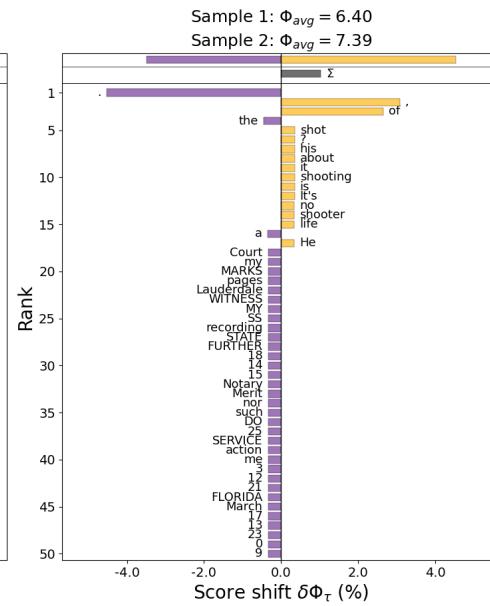
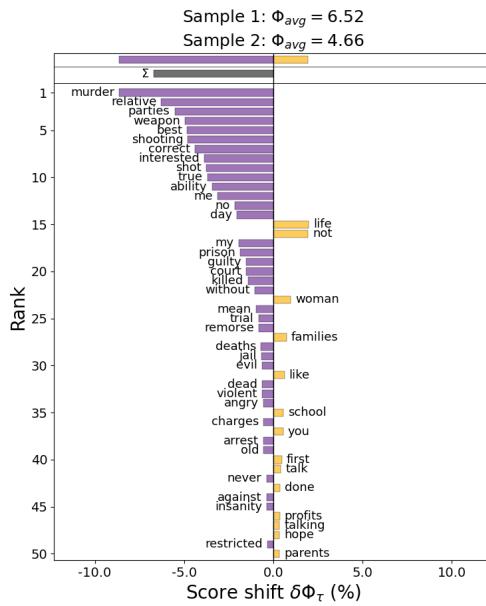
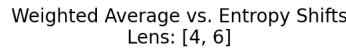


### Sample 1:

Total n-grams: 170  
Total unique n-grams: 111

## Sample 2:

Total n-grams: 925  
Total unique n-grams: 339  
Lensing Window: [4, 6]  
Reference Happiness: 5.474



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

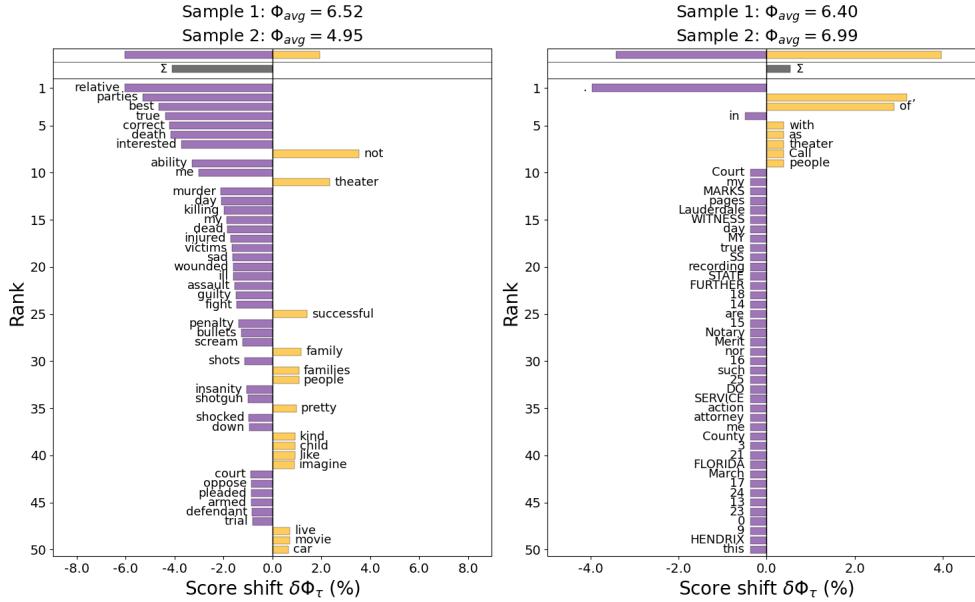
Total n-grams: 358

Total unique n-grams: 201

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

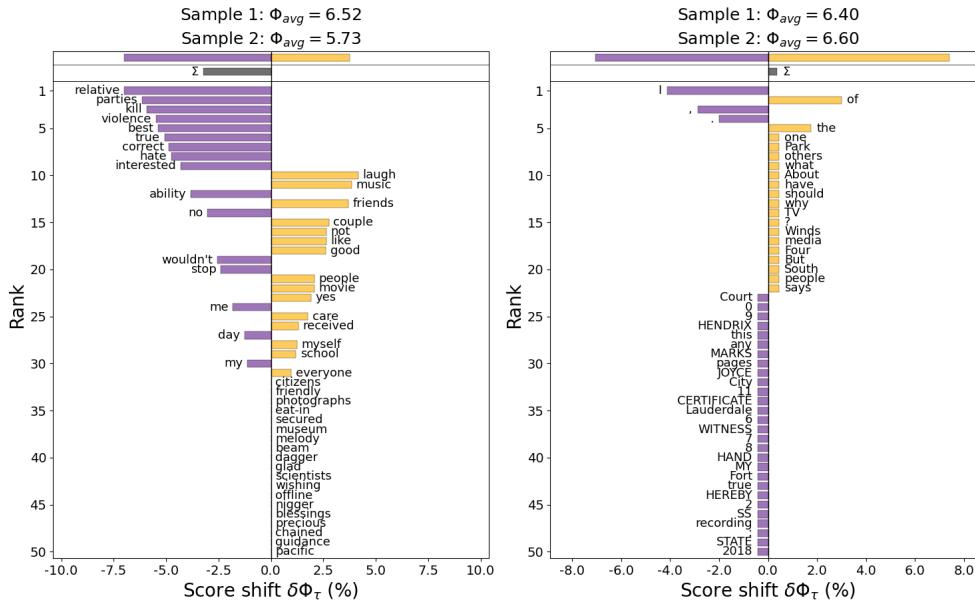
Total n-grams: 223

Total unique n-grams: 143

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

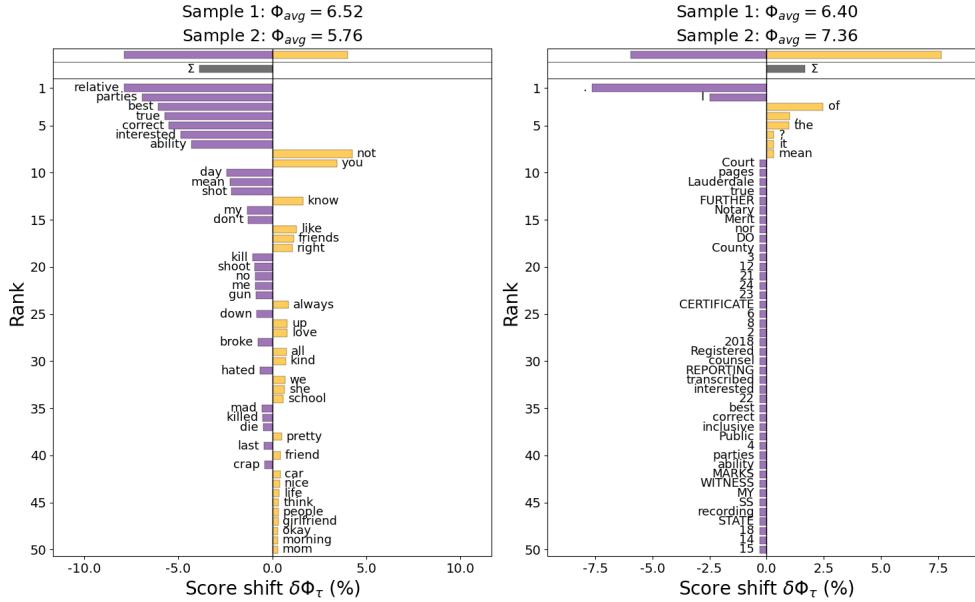
Total n-grams: 3,063

Total unique n-grams: 641

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

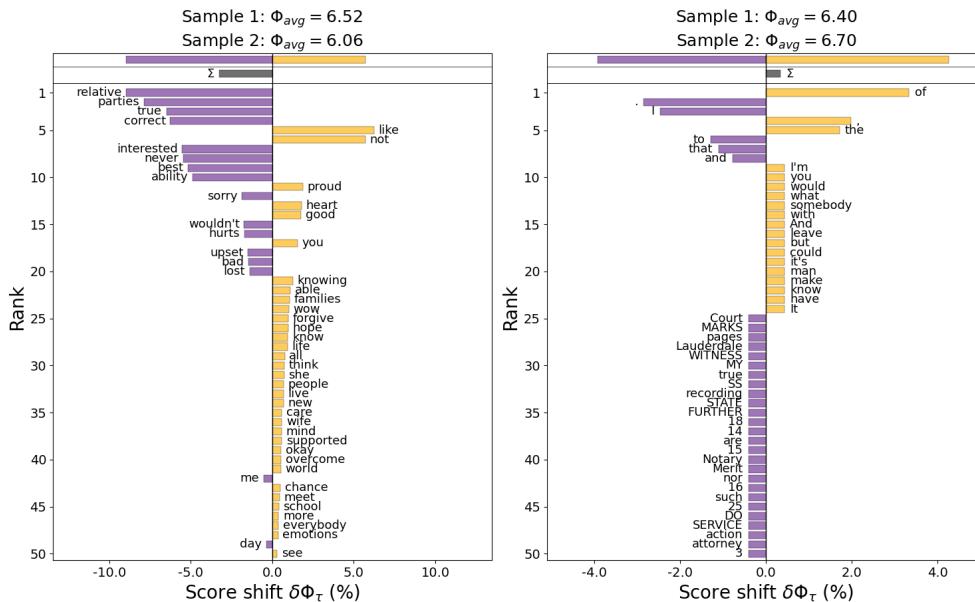
Total n-grams: 445

Total unique n-grams: 175

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

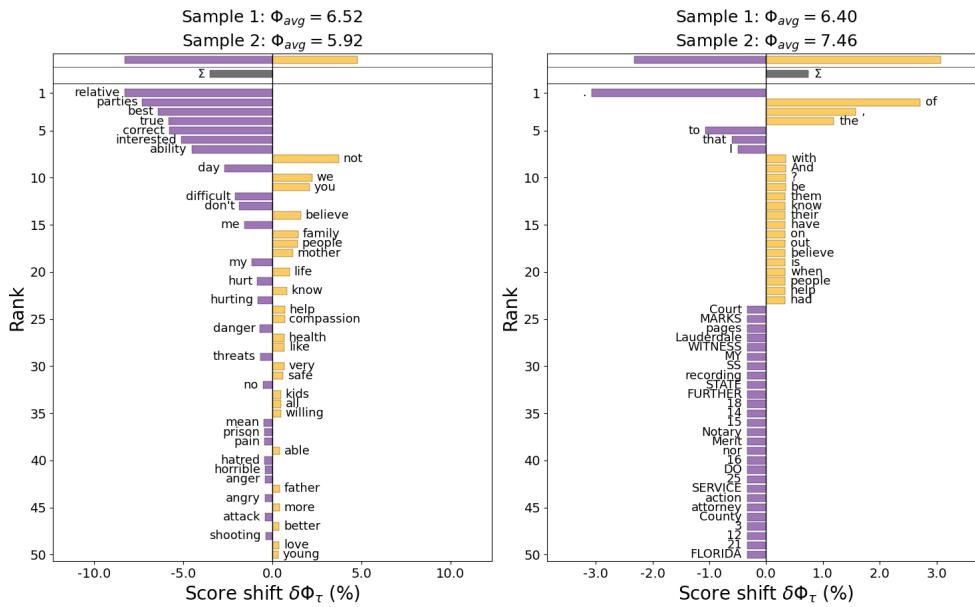
Total n-grams: 1,509

Total unique n-grams: 415

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

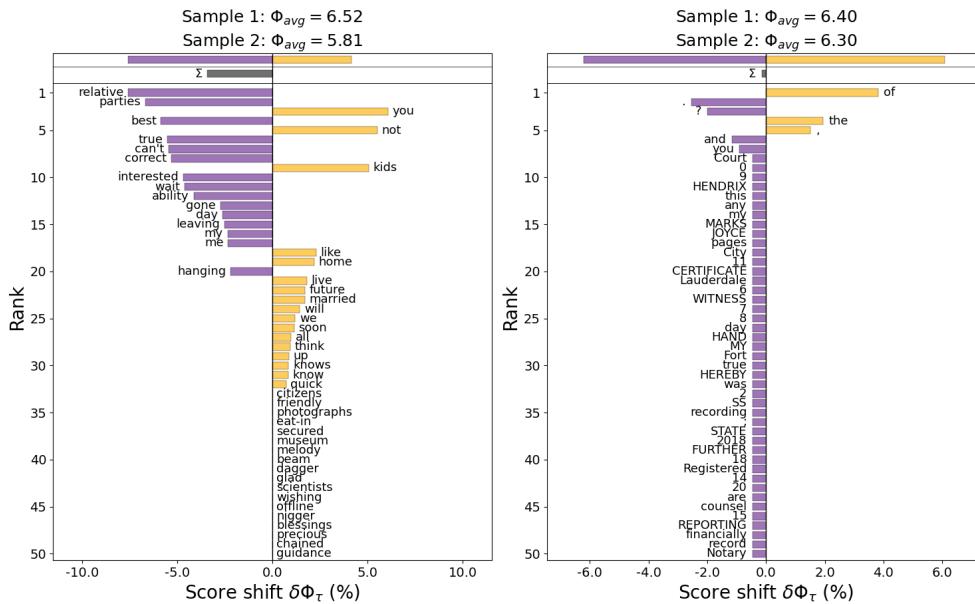
Total n-grams: 172

Total unique n-grams: 104

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

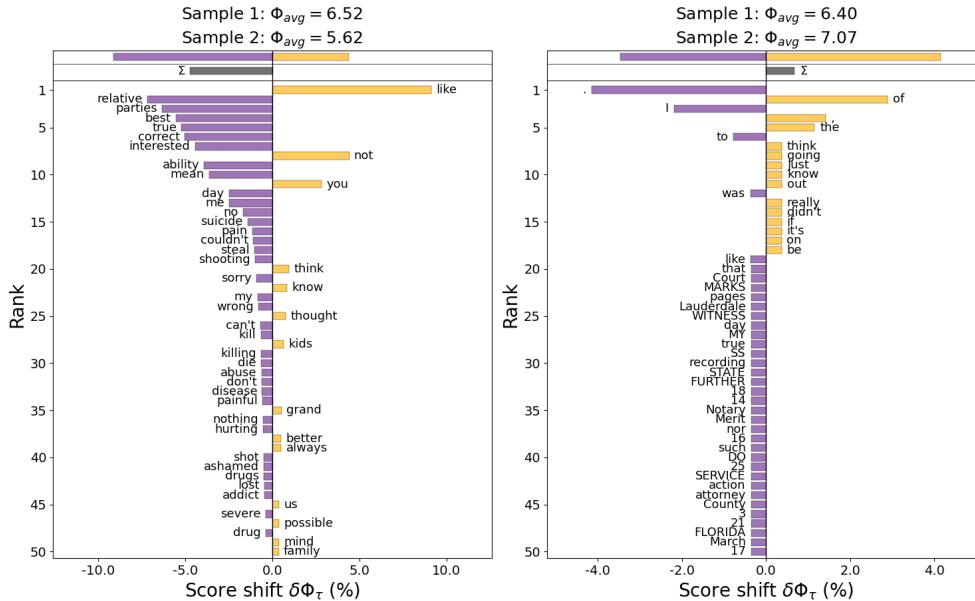
Total n-grams: 1,051

Total unique n-grams: 320

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

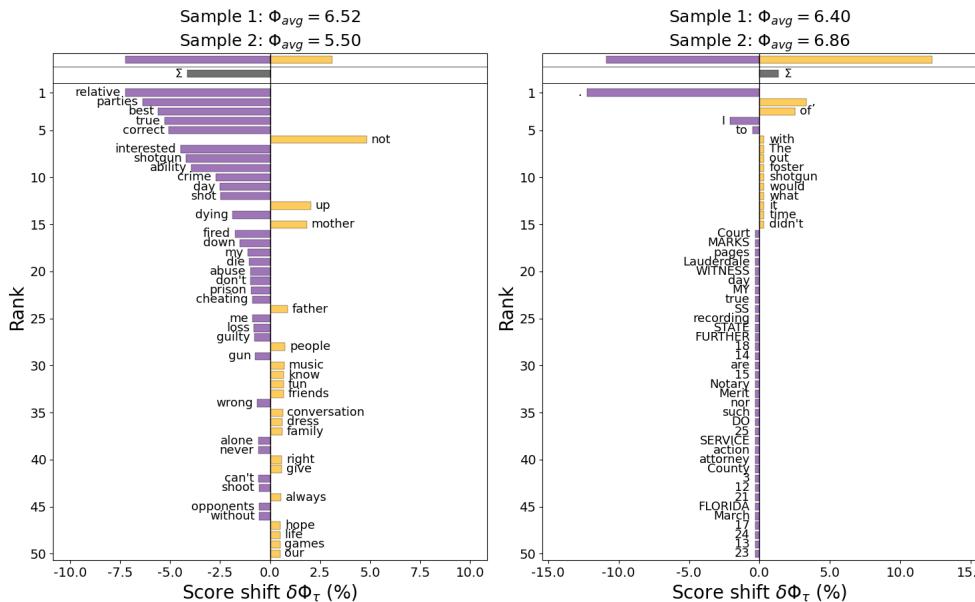
Total n-grams: 787

Total unique n-grams: 300

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

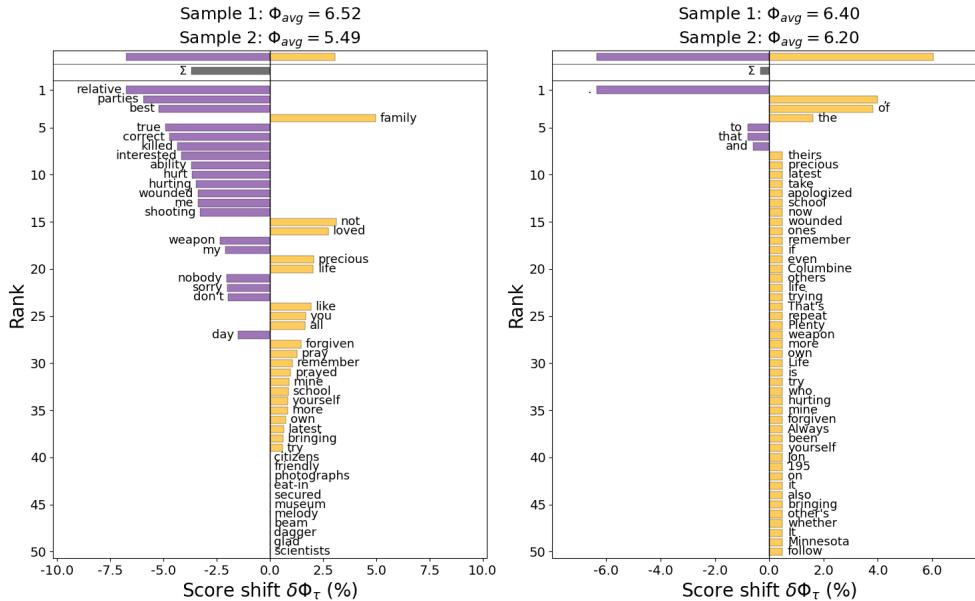
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

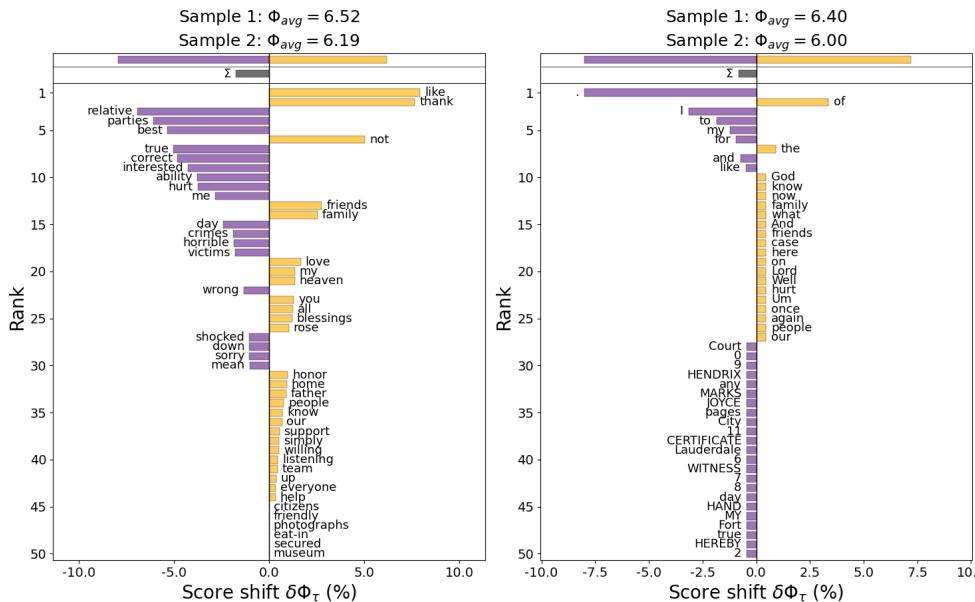
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 170

Total unique n-grams: 111

Sample 2:

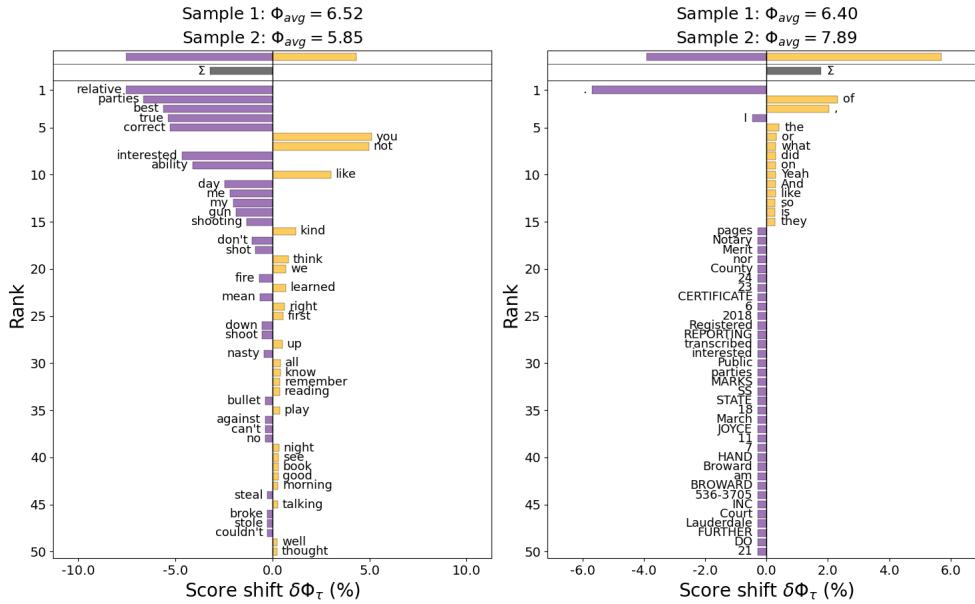
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.474

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

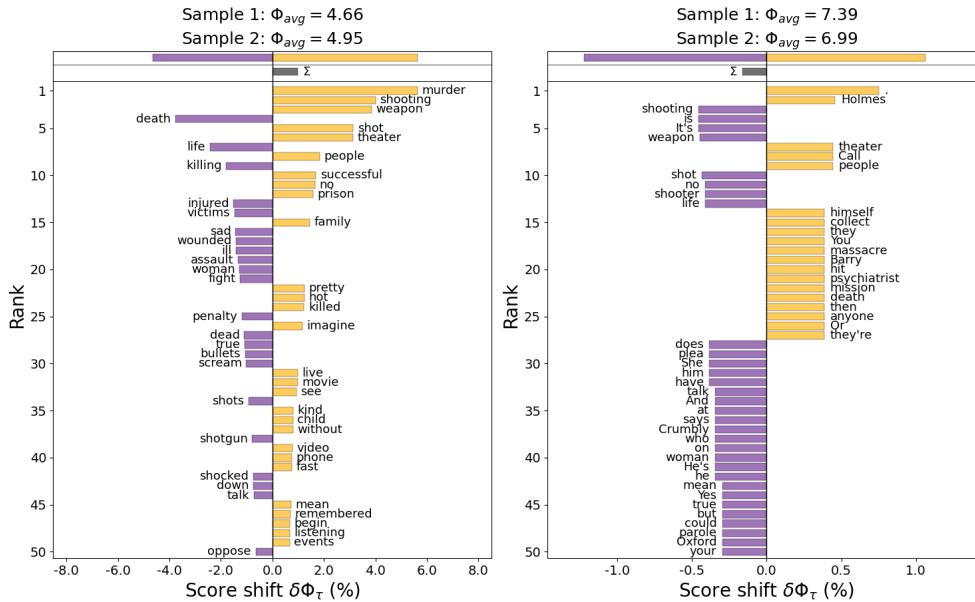
Total n-grams: 358

Total unique n-grams: 201

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

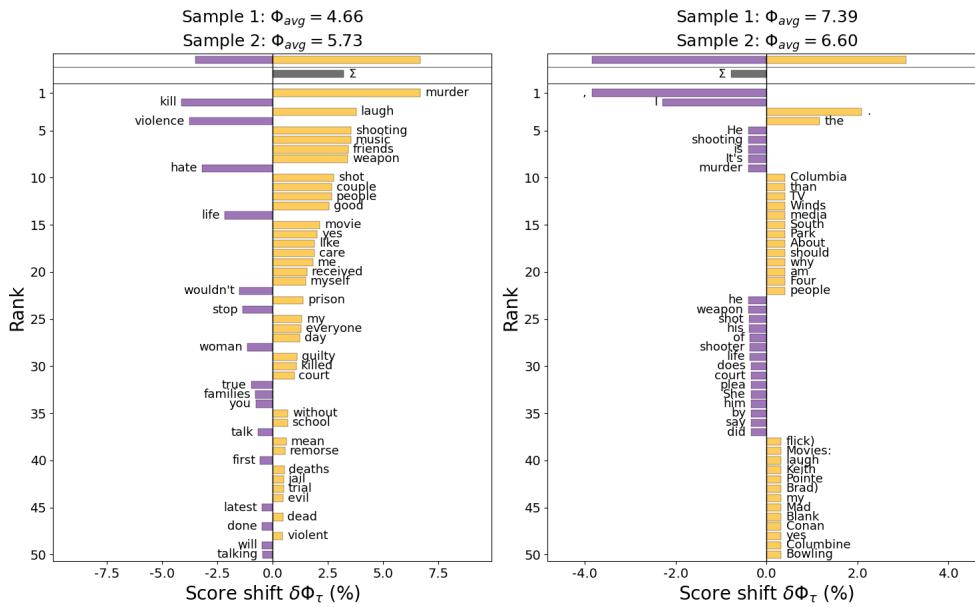
Total n-grams: 223

Total unique n-grams: 143

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

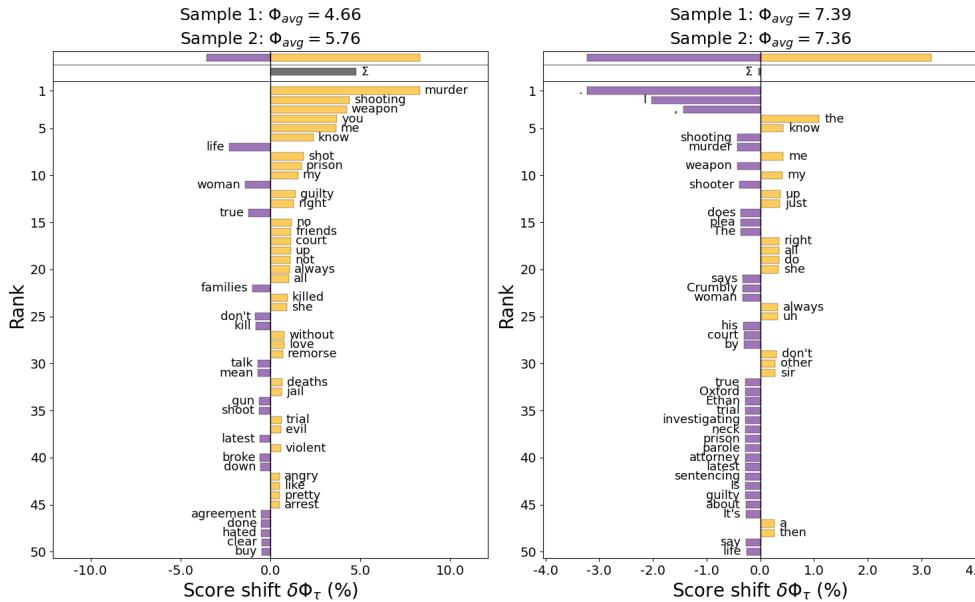
Total n-grams: 3,063

Total unique n-grams: 641

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

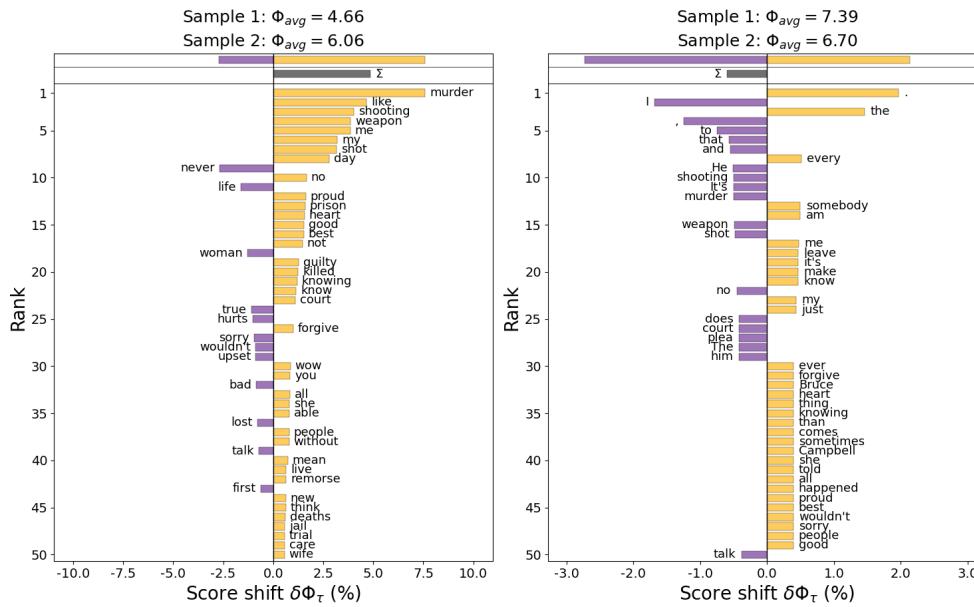
Total n-grams: 445

Total unique n-grams: 175

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

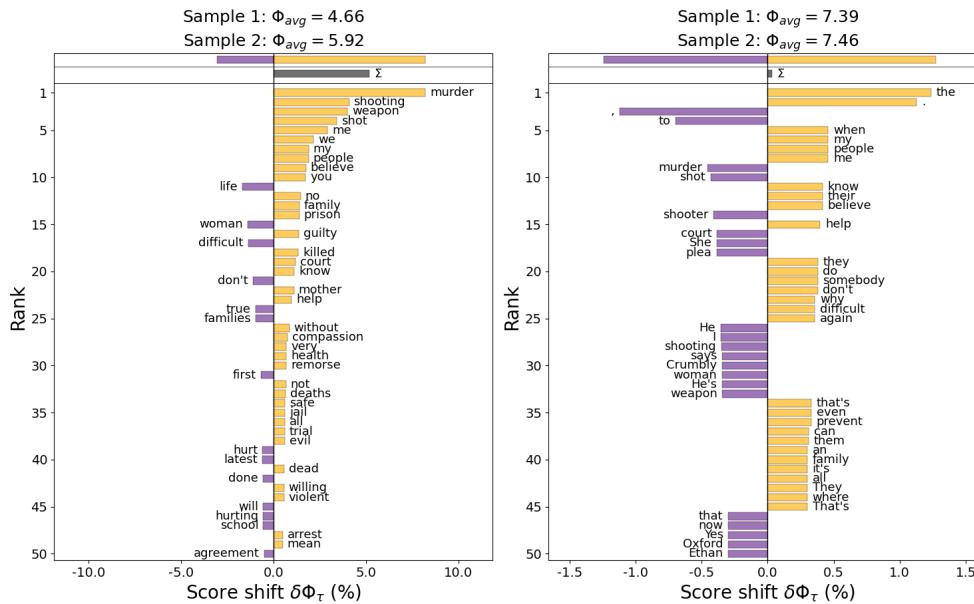
Total n-grams: 1,509

Total unique n-grams: 415

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

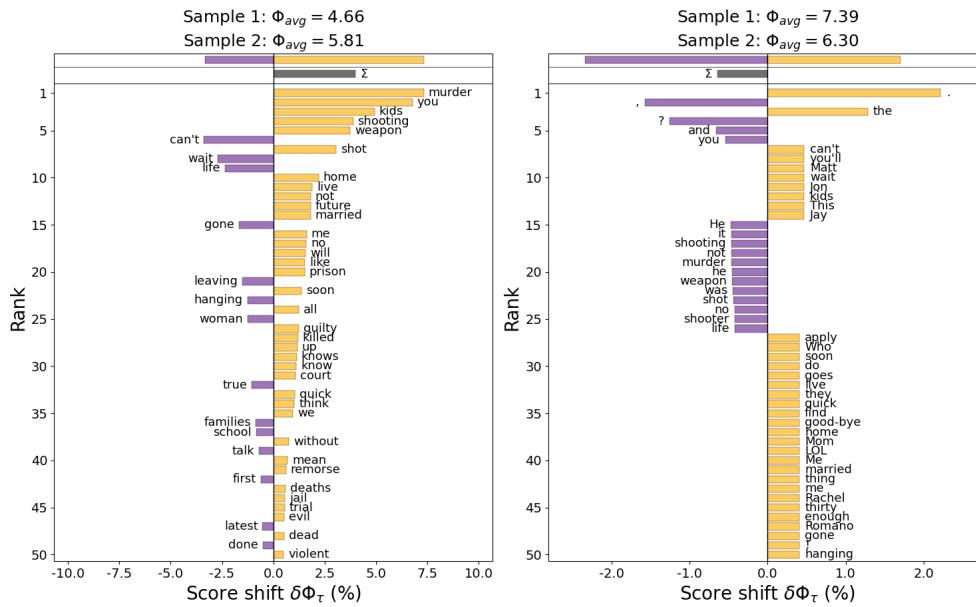
Total n-grams: 172

Total unique n-grams: 104

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

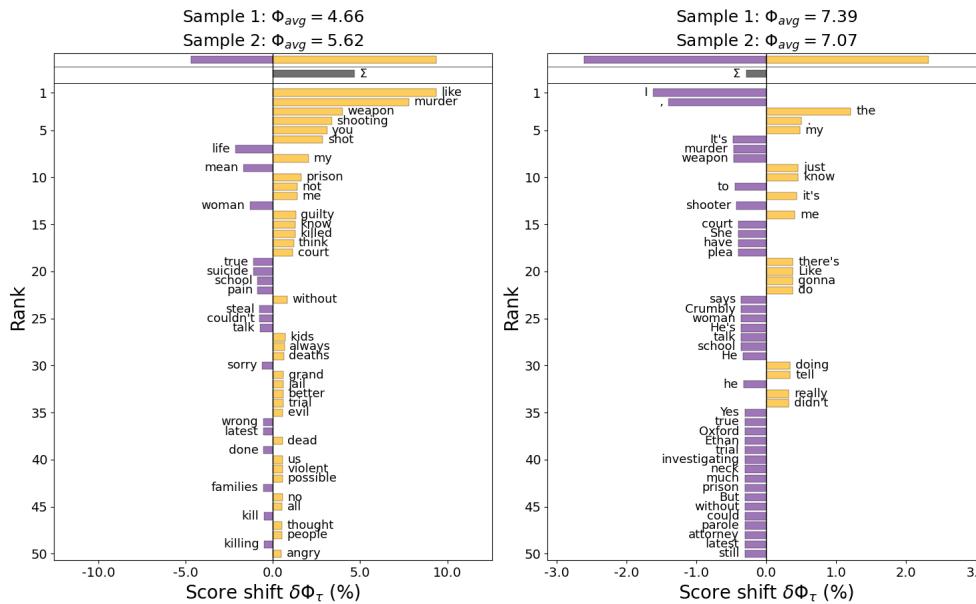
Total n-grams: 1,051

Total unique n-grams: 320

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

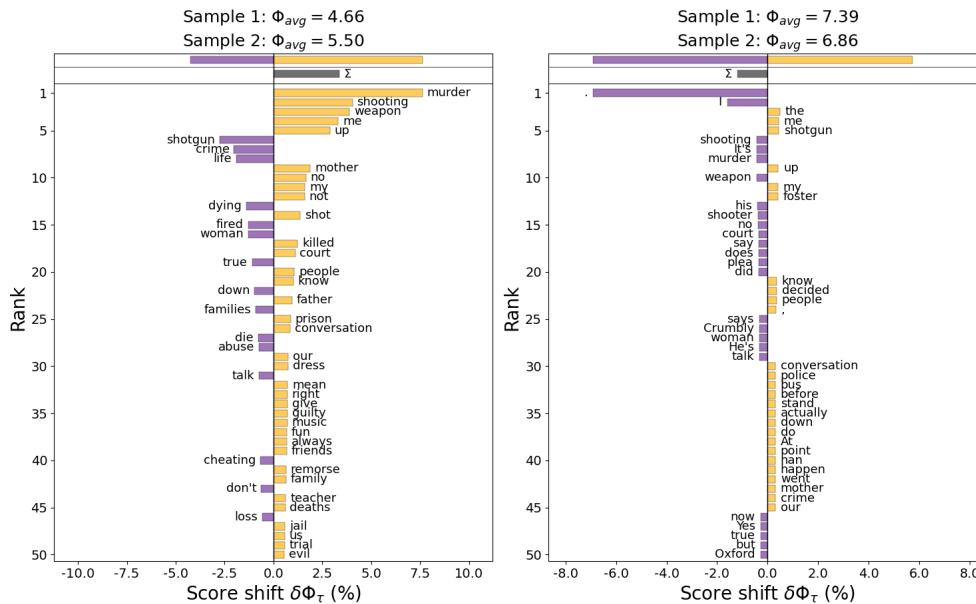
Total n-grams: 787

Total unique n-grams: 300

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

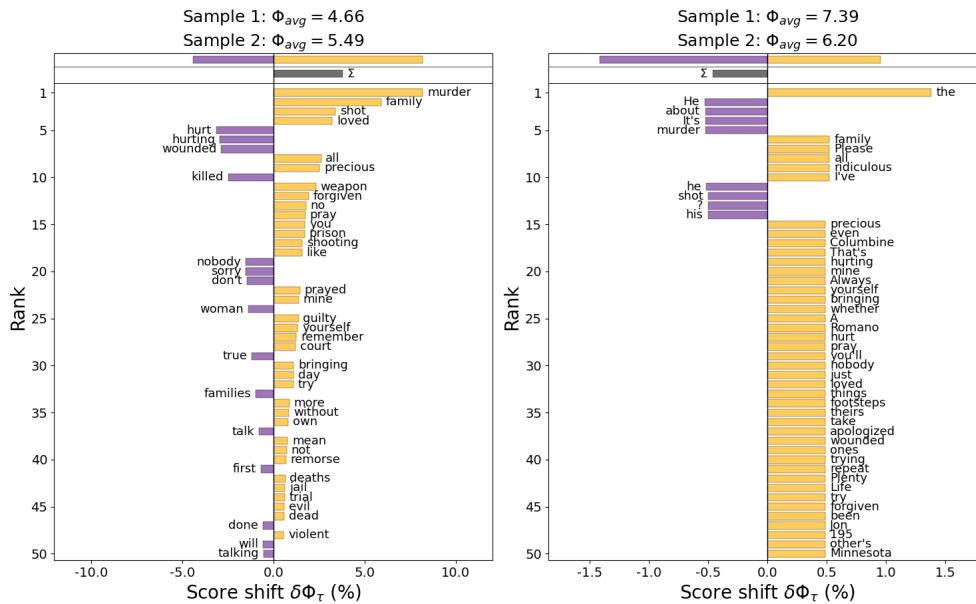
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

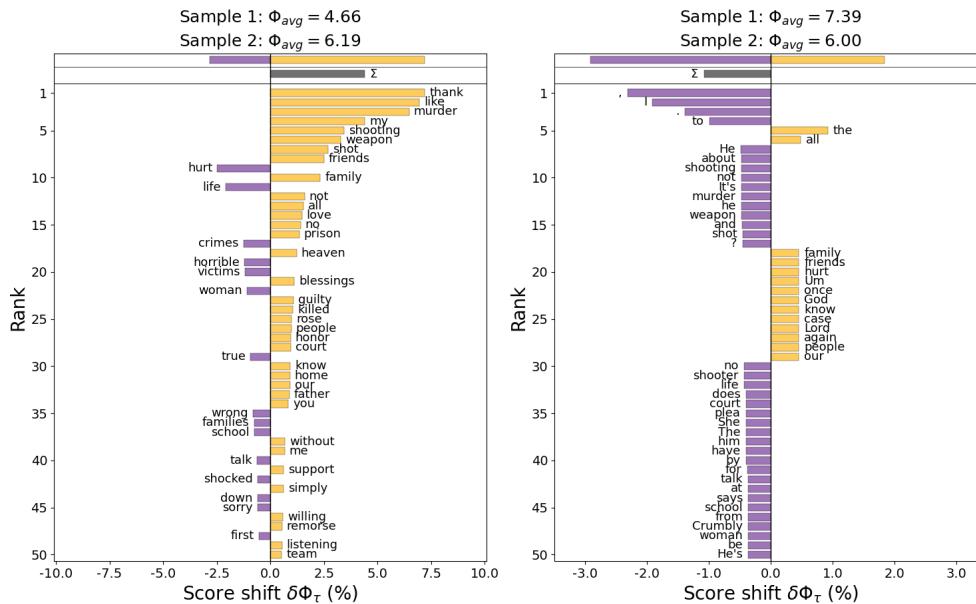
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 925

Total unique n-grams: 339

Sample 2:

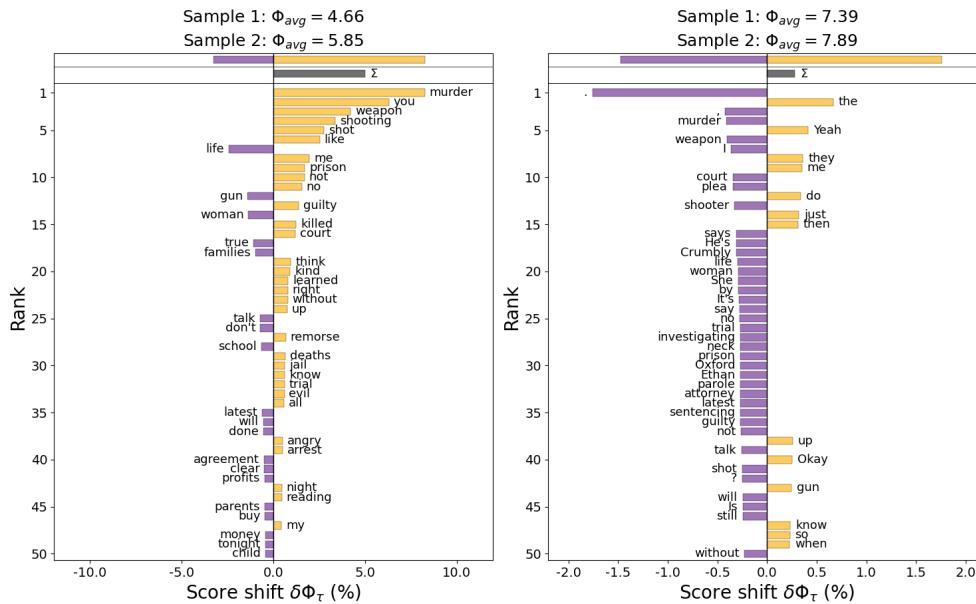
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.031

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

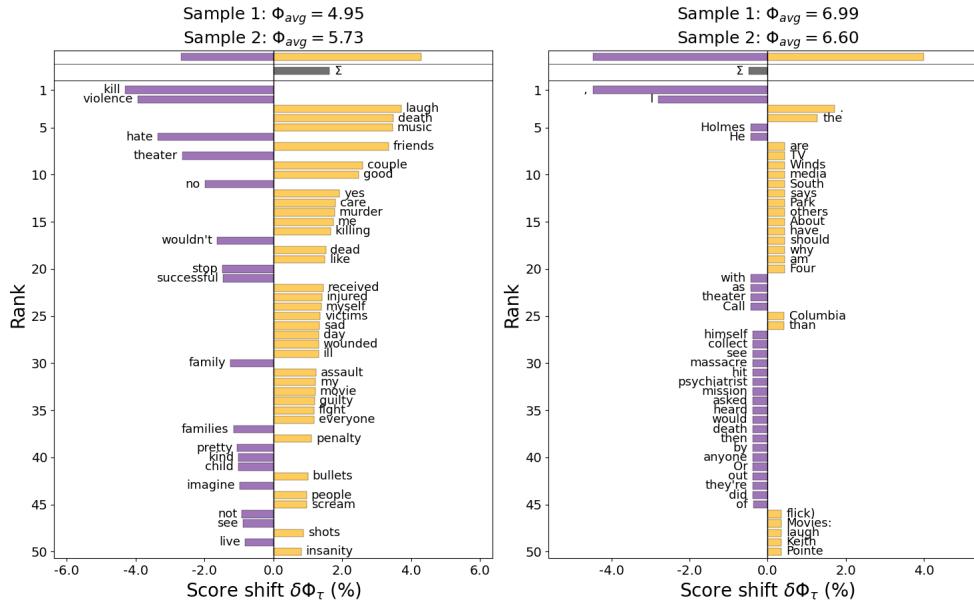
Total n-grams: 223

Total unique n-grams: 143

Lensing Window: [4, 6]

Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

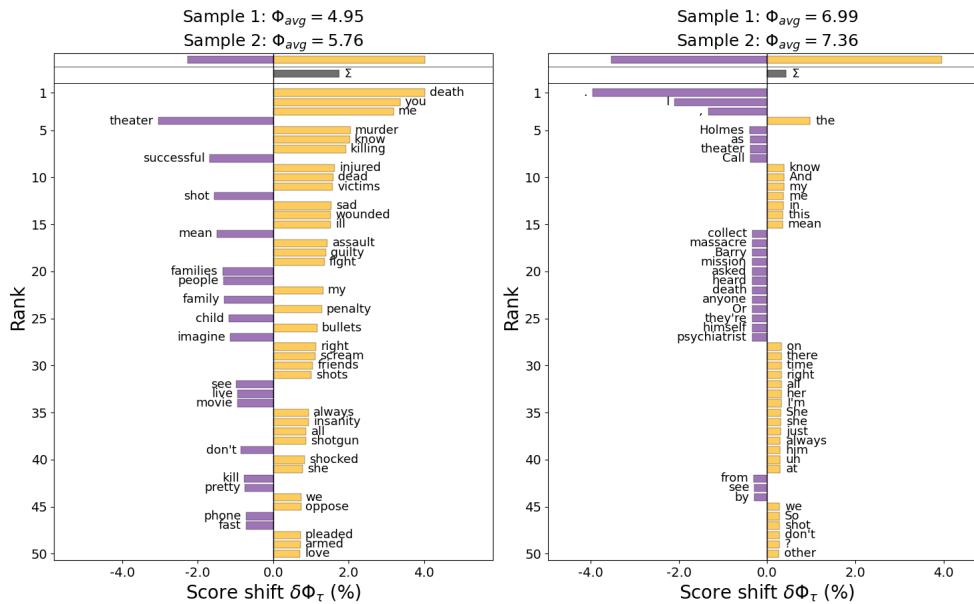
Total n-grams: 3,063

Total unique n-grams: 641

Lensing Window: [4, 6]

Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

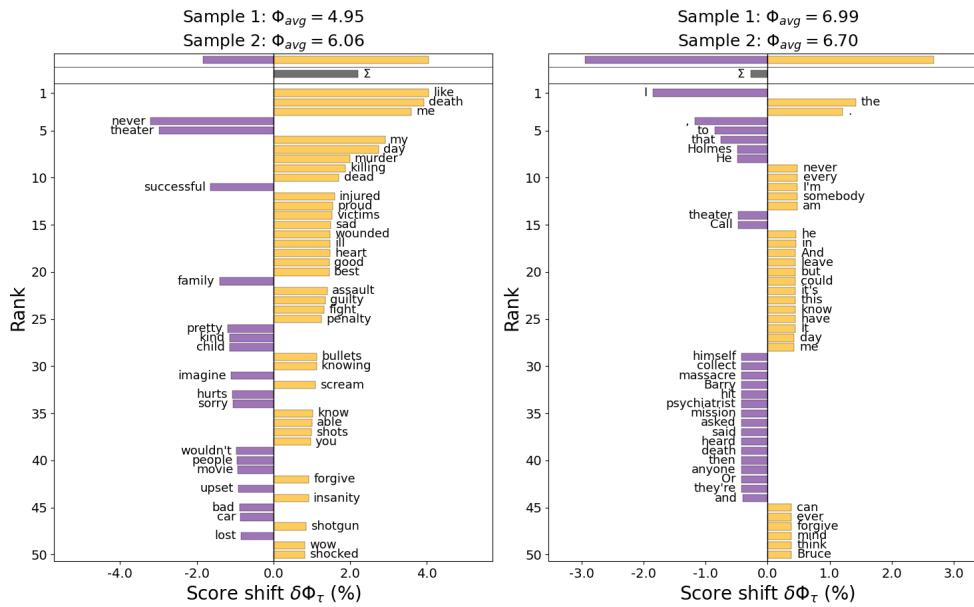
Total n-grams: 445

Total unique n-grams: 175

Lensing Window: [4, 6]

Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

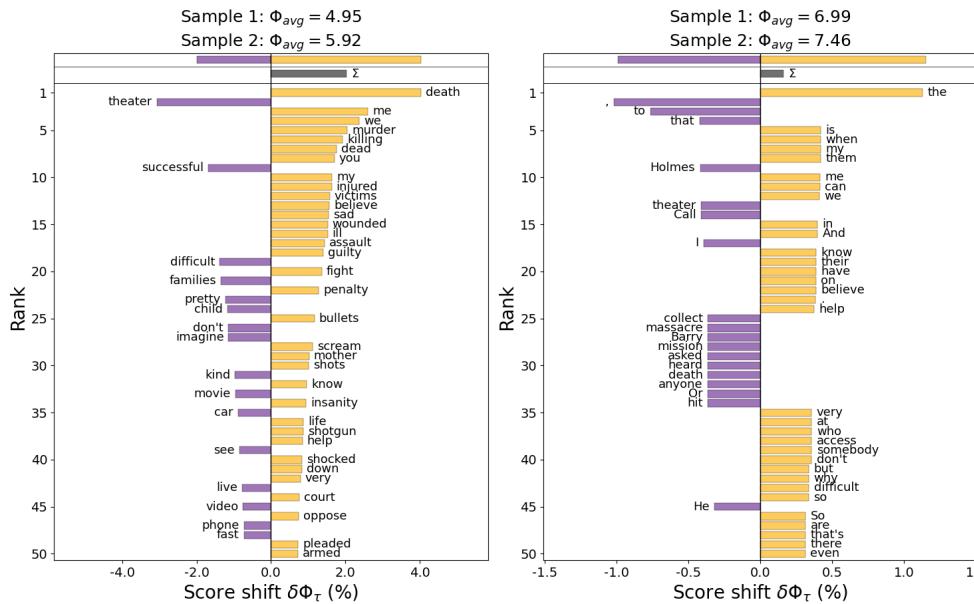
Total n-grams: 1,509

Total unique n-grams: 415

Lensing Window: [4, 6]

Reference Happiness: 5.138

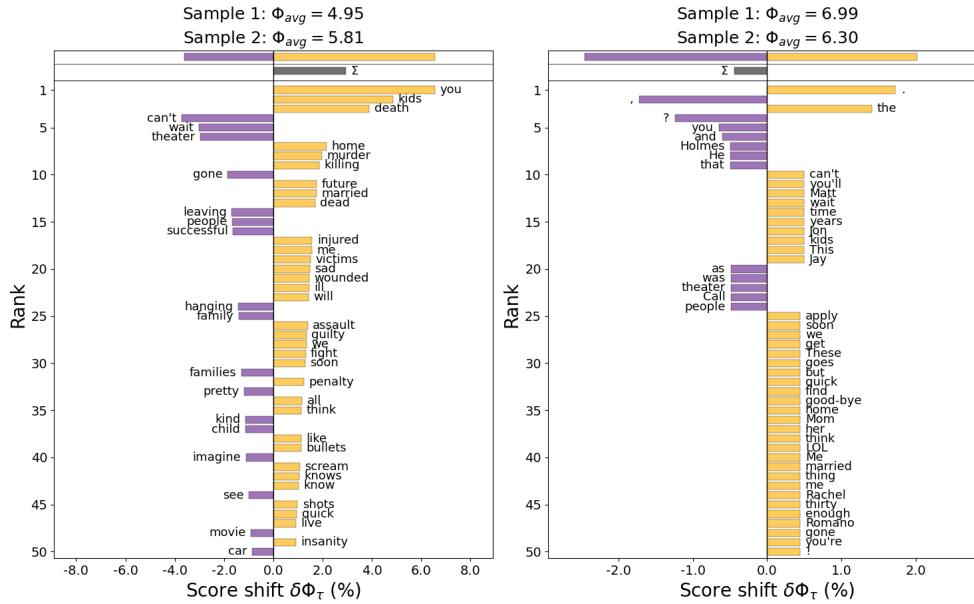
Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:  
 Total n-grams: 358  
 Total unique n-grams: 201

Sample 2:  
 Total n-grams: 172  
 Total unique n-grams: 104  
 Lensing Window: [4, 6]  
 Reference Happiness: 5.138

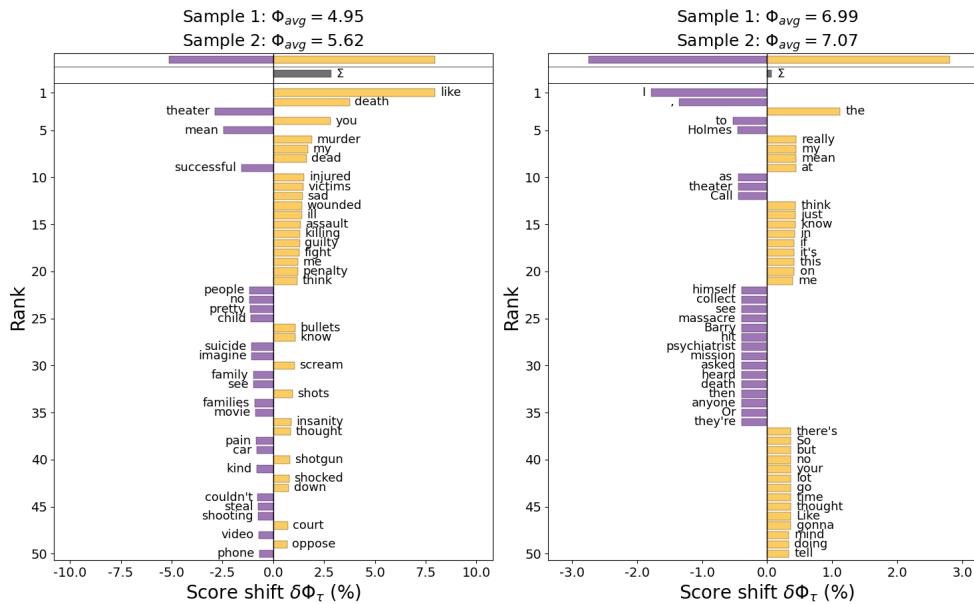
Weighted Average vs. Entropy Shifts  
 Lens: [4, 6]



Sample 1:  
 Total n-grams: 358  
 Total unique n-grams: 201

Sample 2:  
 Total n-grams: 1,051  
 Total unique n-grams: 320  
 Lensing Window: [4, 6]  
 Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
 Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

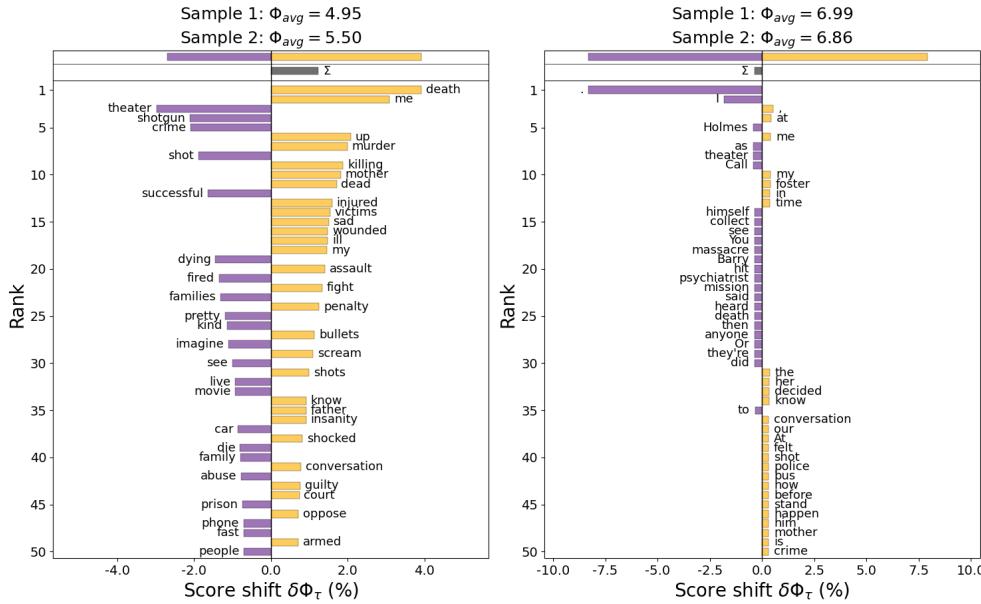
Total n-grams: 787

Total unique n-grams: 300

Lensing Window: [4, 6]

Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

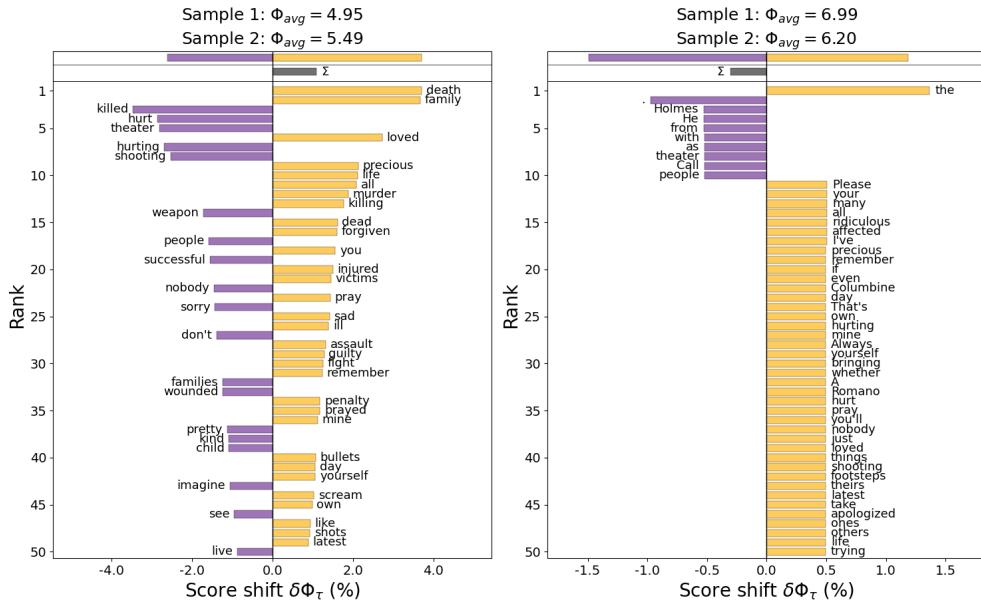
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

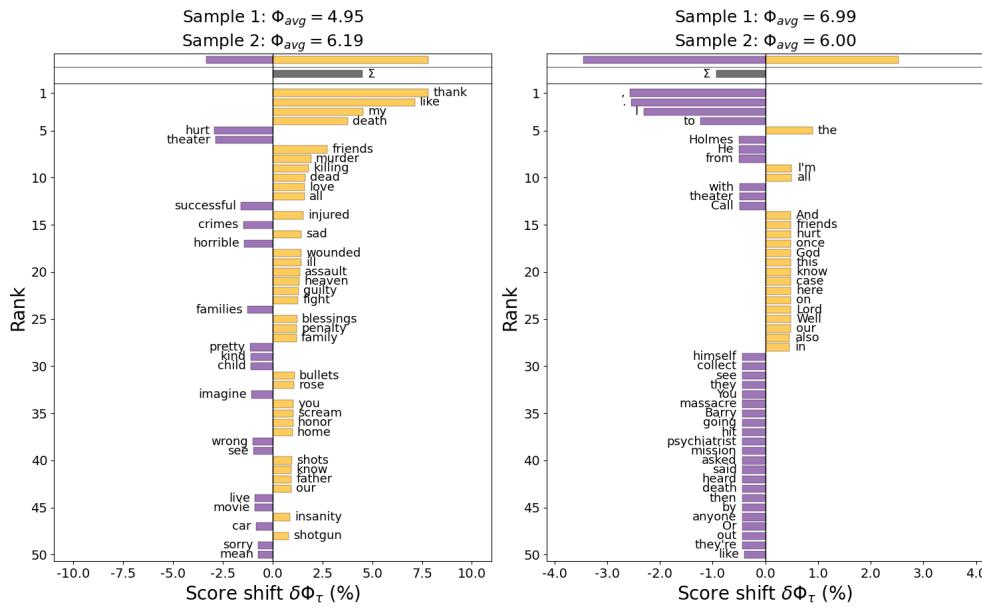
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 358

Total unique n-grams: 201

Sample 2:

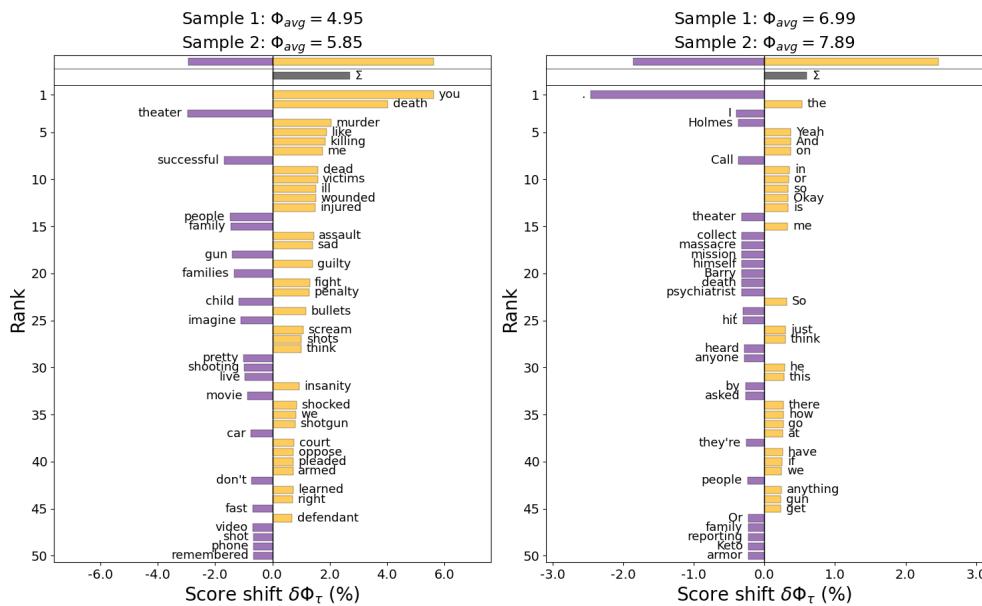
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.138

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

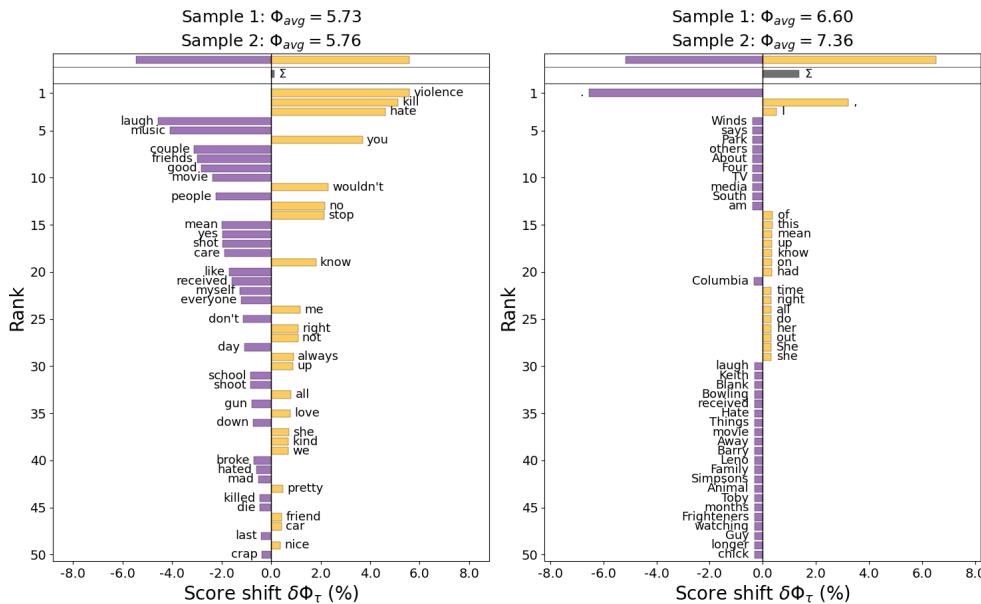
Total n-grams: 3,063

Total unique n-grams: 641

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

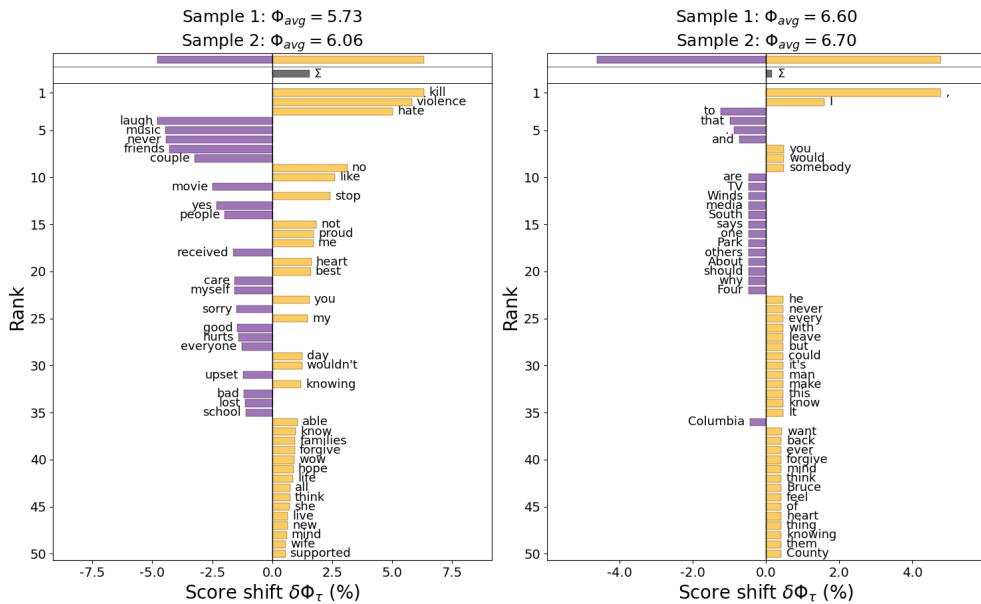
Total n-grams: 445

Total unique n-grams: 175

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

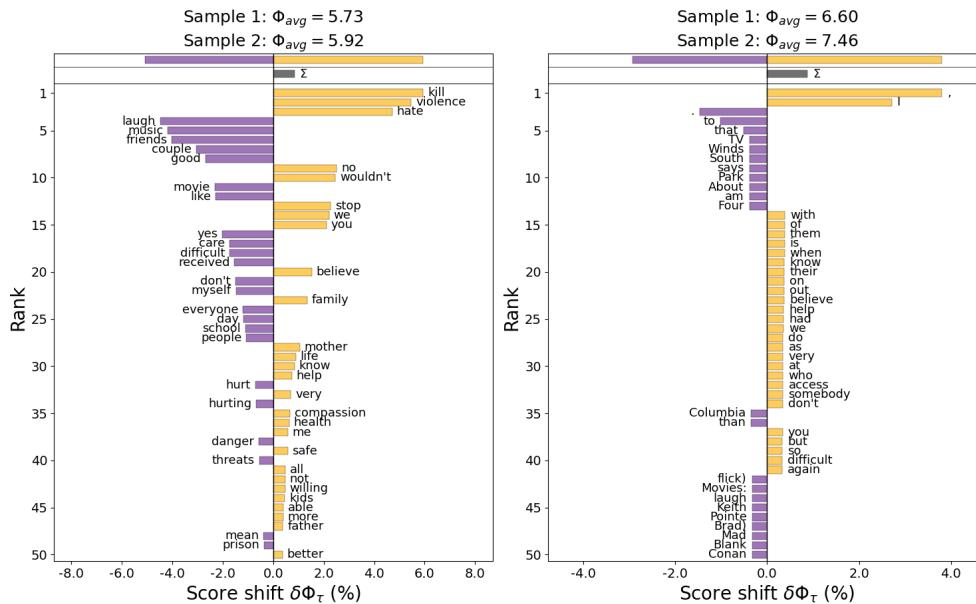
Total n-grams: 1,509

Total unique n-grams: 415

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

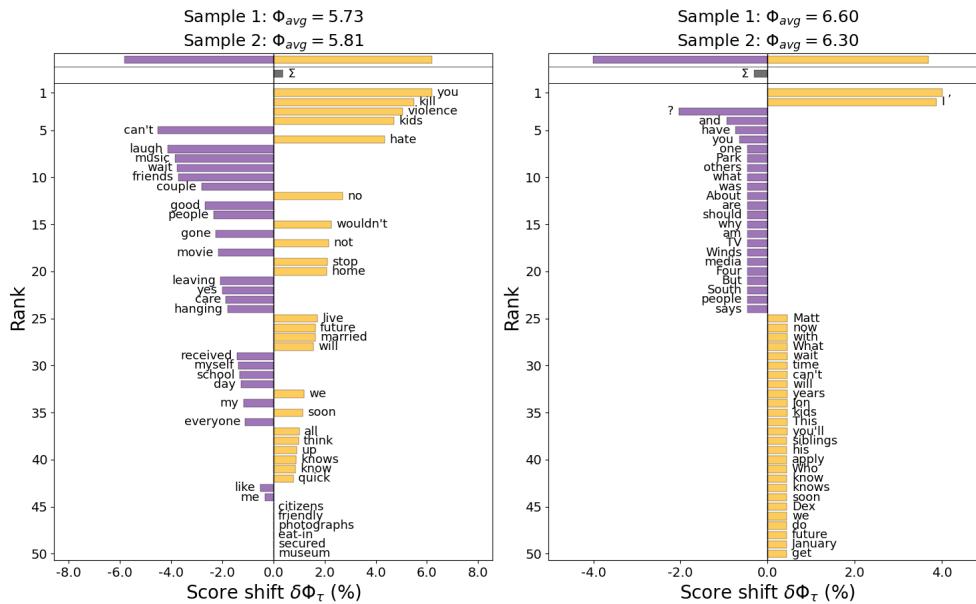
Total n-grams: 172

Total unique n-grams: 104

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

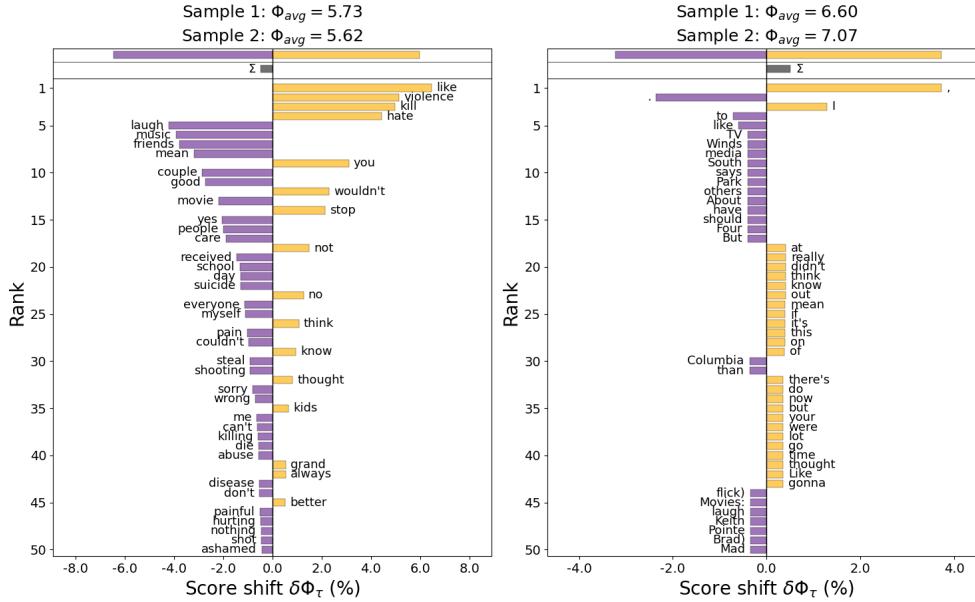
Total n-grams: 1,051

Total unique n-grams: 320

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

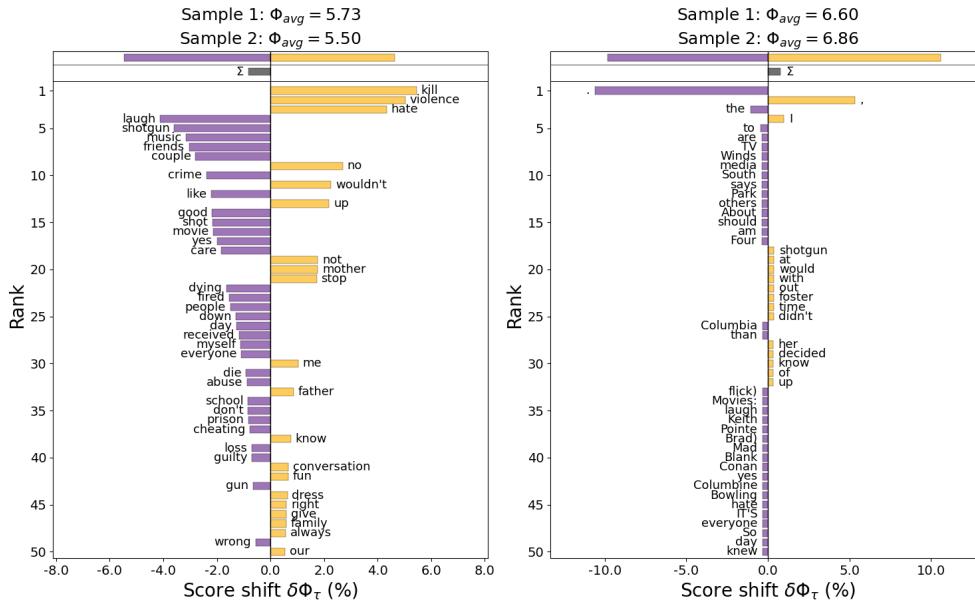
Total n-grams: 787

Total unique n-grams: 300

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

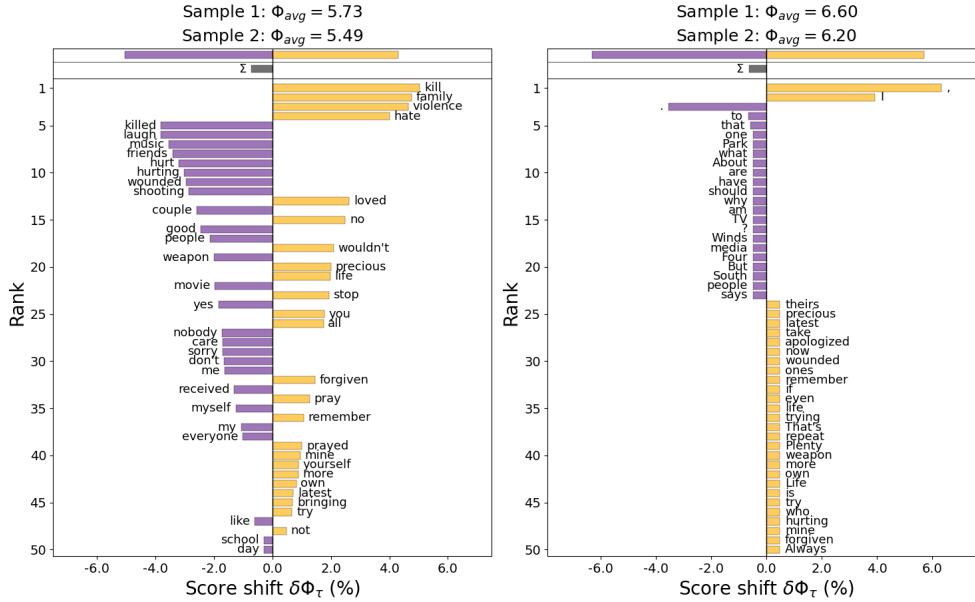
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

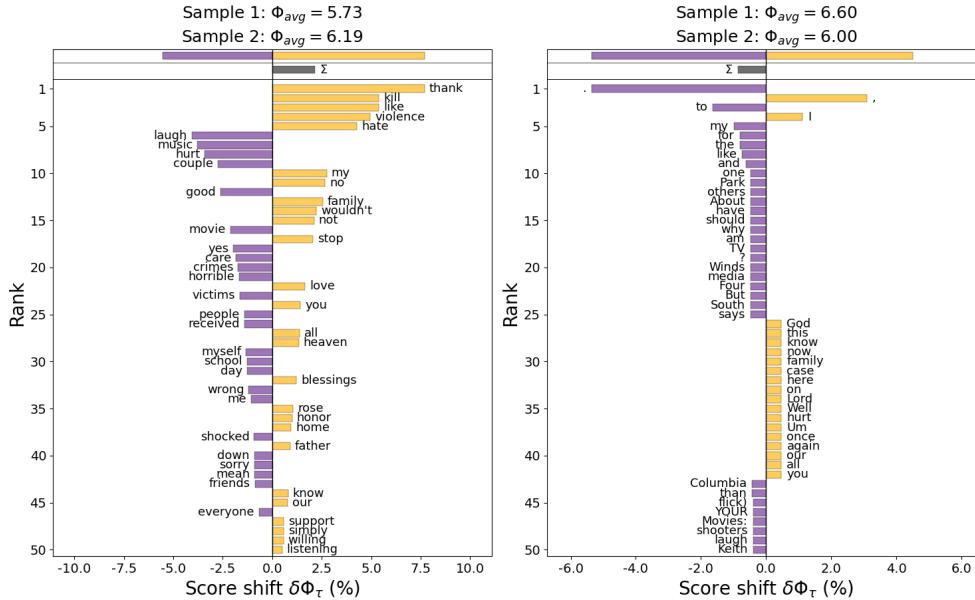
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 223

Total unique n-grams: 143

Sample 2:

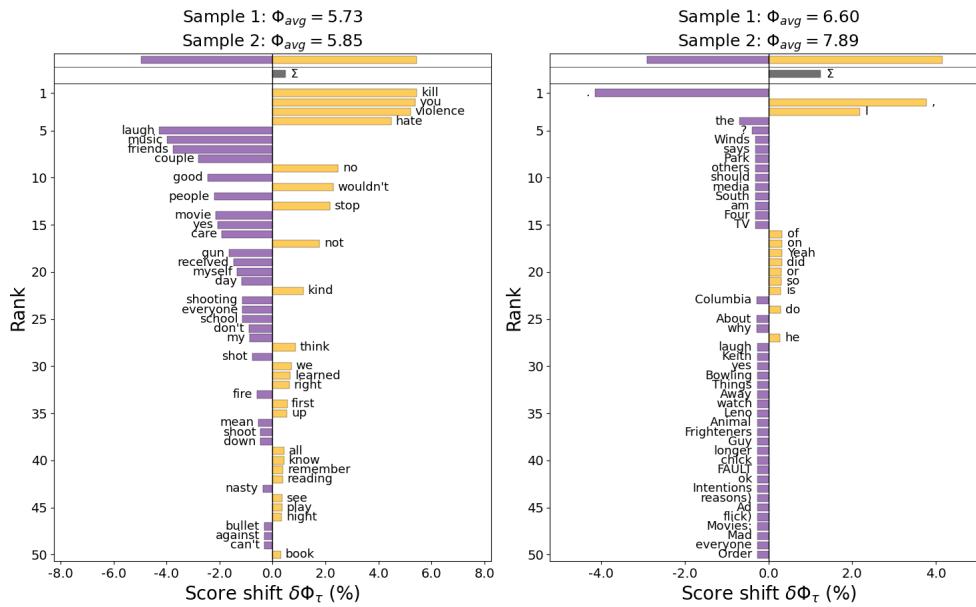
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.354

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 3,063

Total unique n-grams: 641

Sample 2:

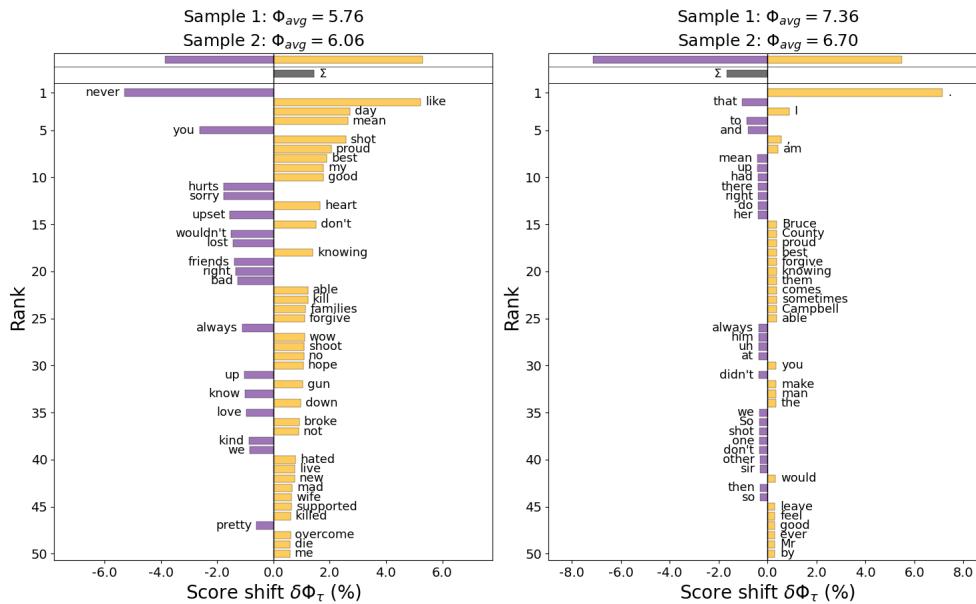
Total n-grams: 445

Total unique n-grams: 175

Lensing Window: [4, 6]

Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



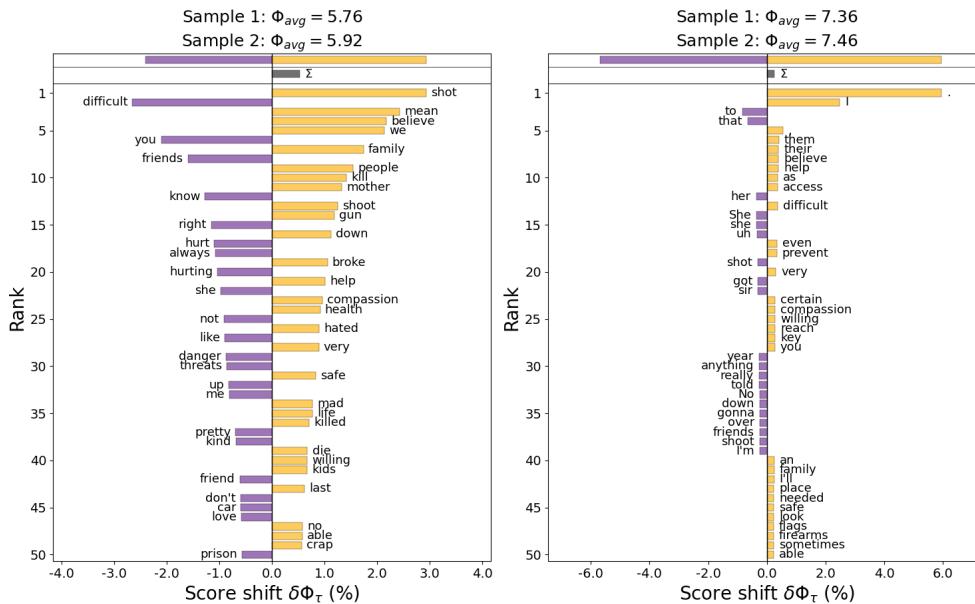
Sample 1:

Total n-grams: 3,063  
Total unique n-grams: 641

Sample 2:

Total n-grams: 1,509  
Total unique n-grams: 415  
Lensing Window: [4, 6]  
Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



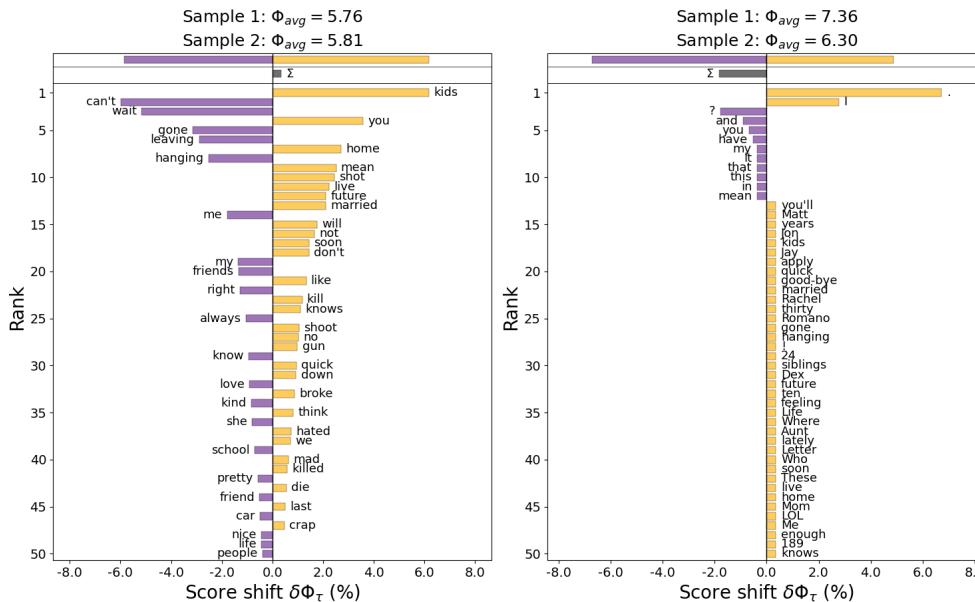
Sample 1:

Total n-grams: 3,063  
Total unique n-grams: 641

Sample 2:

Total n-grams: 172  
Total unique n-grams: 104  
Lensing Window: [4, 6]  
Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



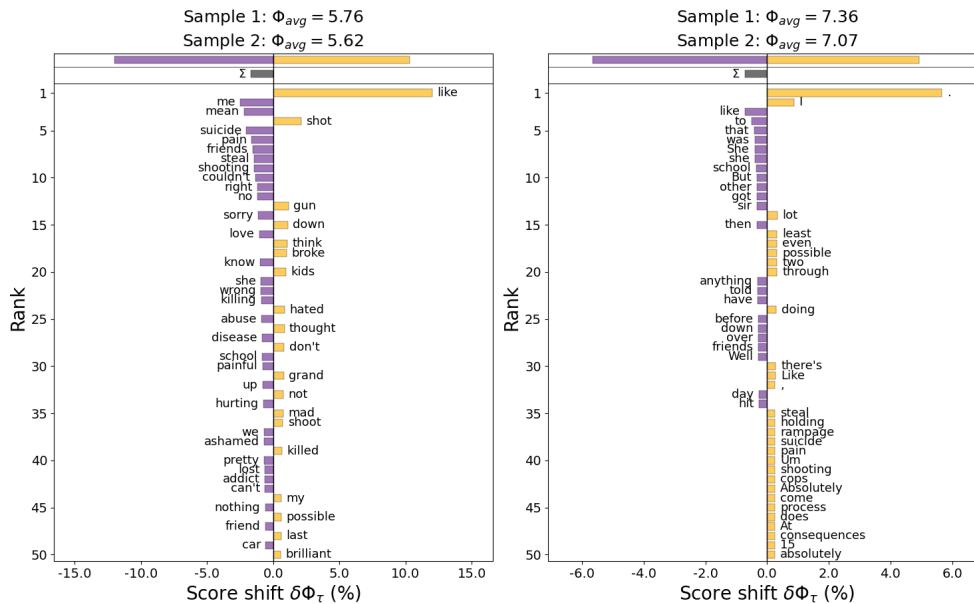
Sample 1:

Total n-grams: 3,063  
Total unique n-grams: 641

Sample 2:

Total n-grams: 1,051  
Total unique n-grams: 320  
Lensing Window: [4, 6]  
Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



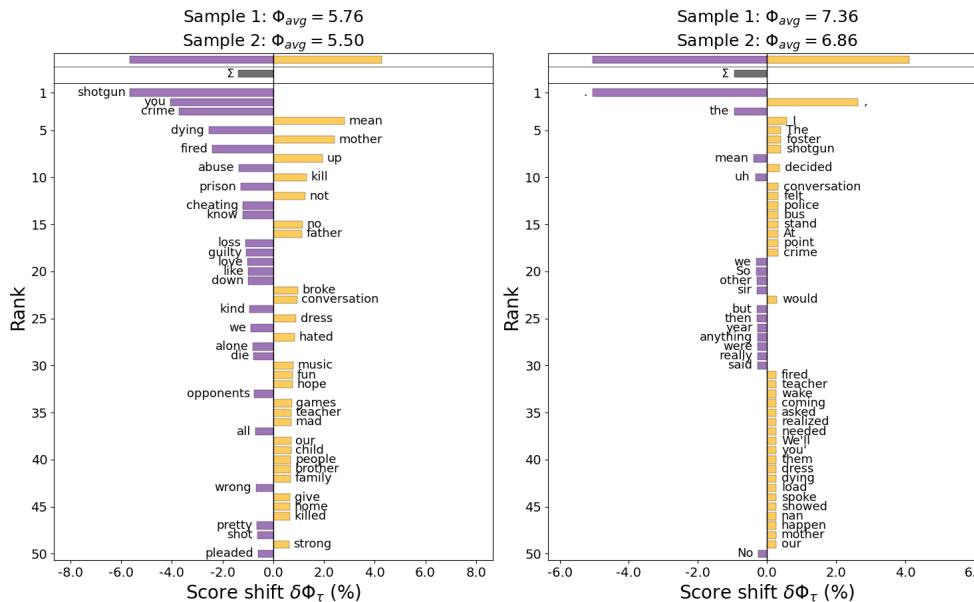
Sample 1:

Total n-grams: 3,063  
Total unique n-grams: 641

Sample 2:

Total n-grams: 787  
Total unique n-grams: 300  
Lensing Window: [4, 6]  
Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



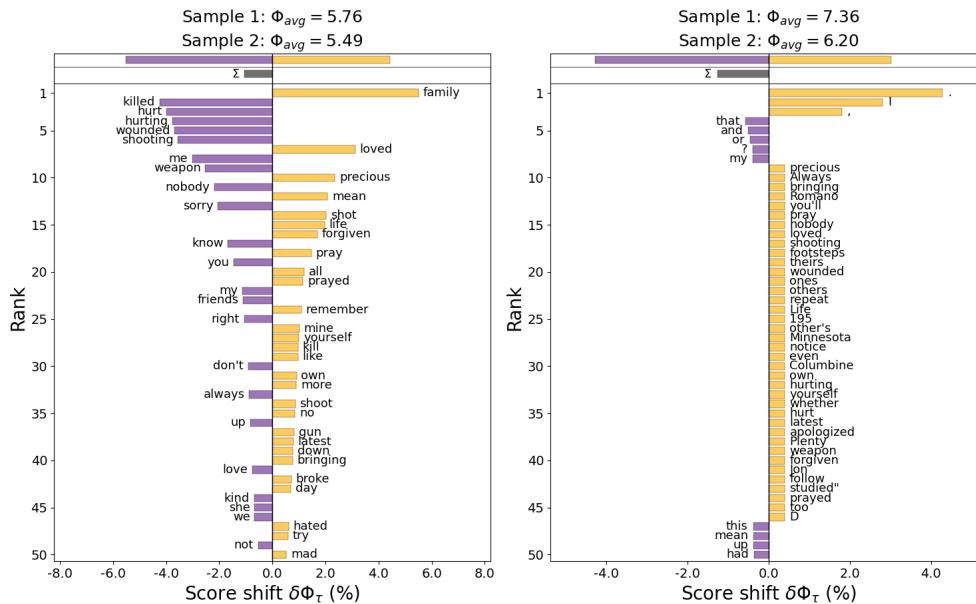
Sample 1:

Total n-grams: 3,063  
Total unique n-grams: 641

Sample 2:

Total n-grams: 146  
Total unique n-grams: 93  
Lensing Window: [4, 6]  
Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



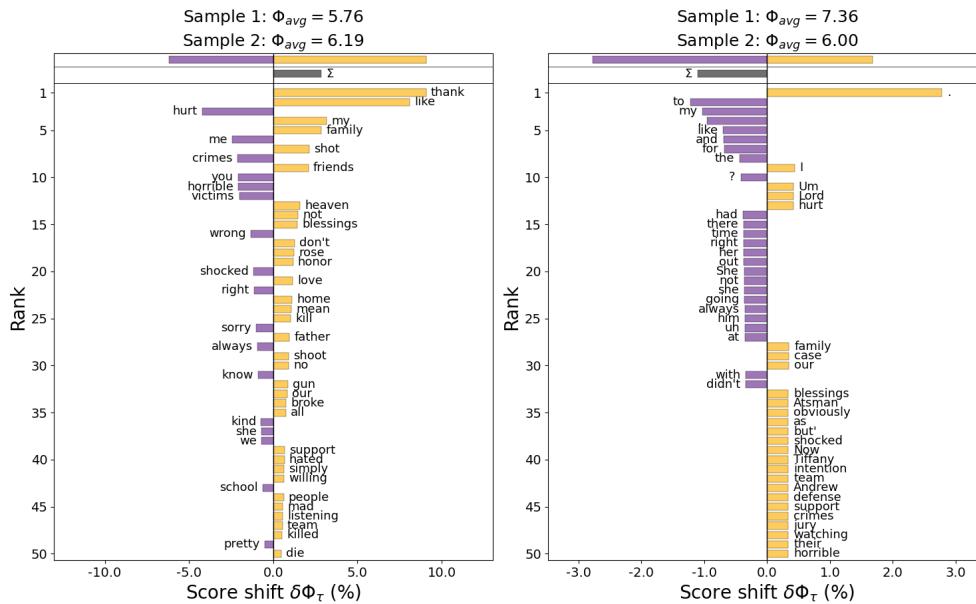
Sample 1:

Total n-grams: 3,063  
Total unique n-grams: 641

Sample 2:

Total n-grams: 266  
Total unique n-grams: 113  
Lensing Window: [4, 6]  
Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



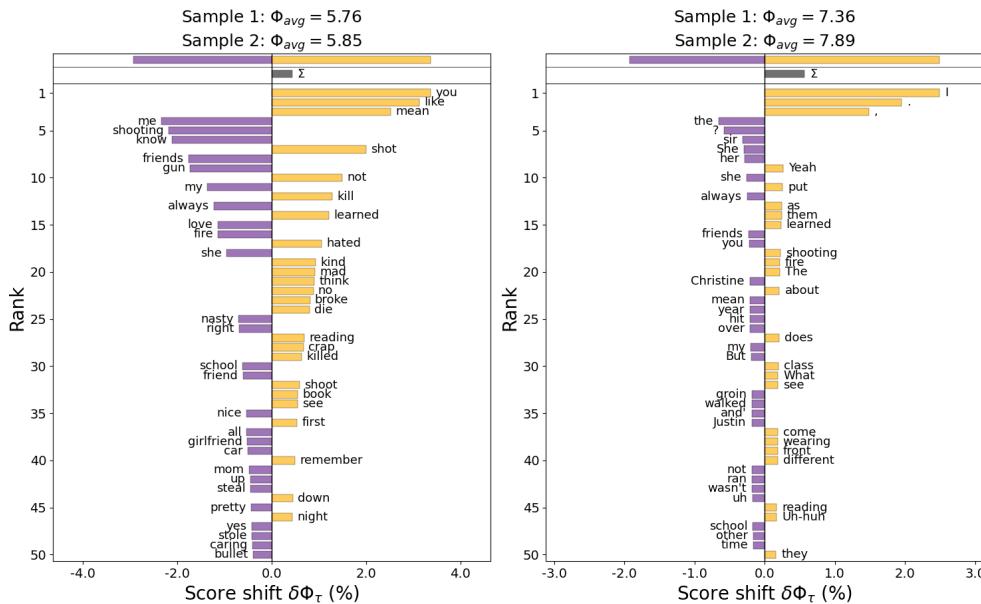
Sample 1:

Total n-grams: 3,063  
Total unique n-grams: 641

Sample 2:

Total n-grams: 8,551  
Total unique n-grams: 1,314  
Lensing Window: [4, 6]  
Reference Happiness: 5.418

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



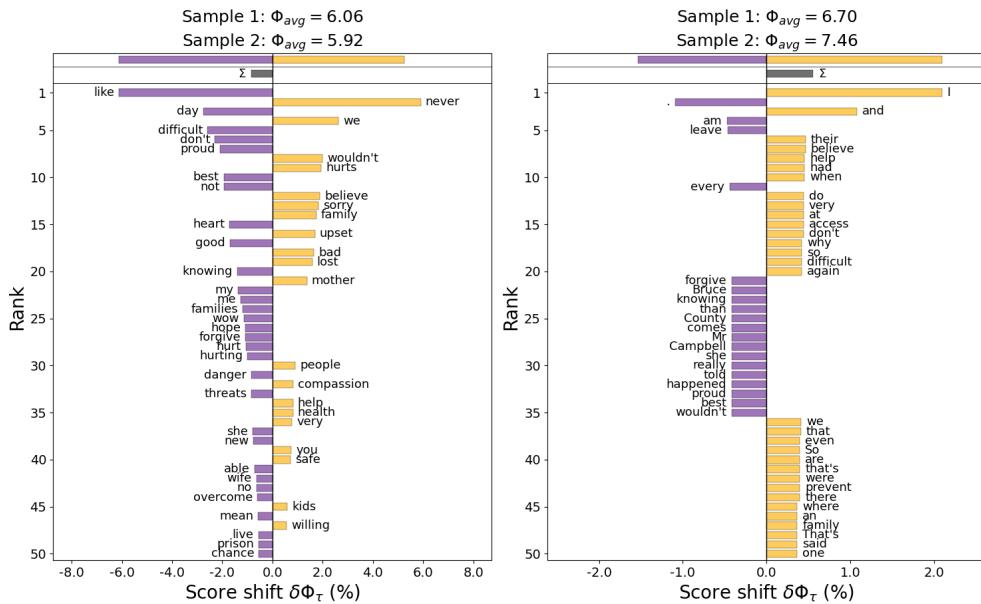
Sample 1:

Total n-grams: 445  
Total unique n-grams: 175

Sample 2:

Total n-grams: 1,509  
Total unique n-grams: 415  
Lensing Window: [4, 6]  
Reference Happiness: 5.505

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 445

Total unique n-grams: 175

Sample 2:

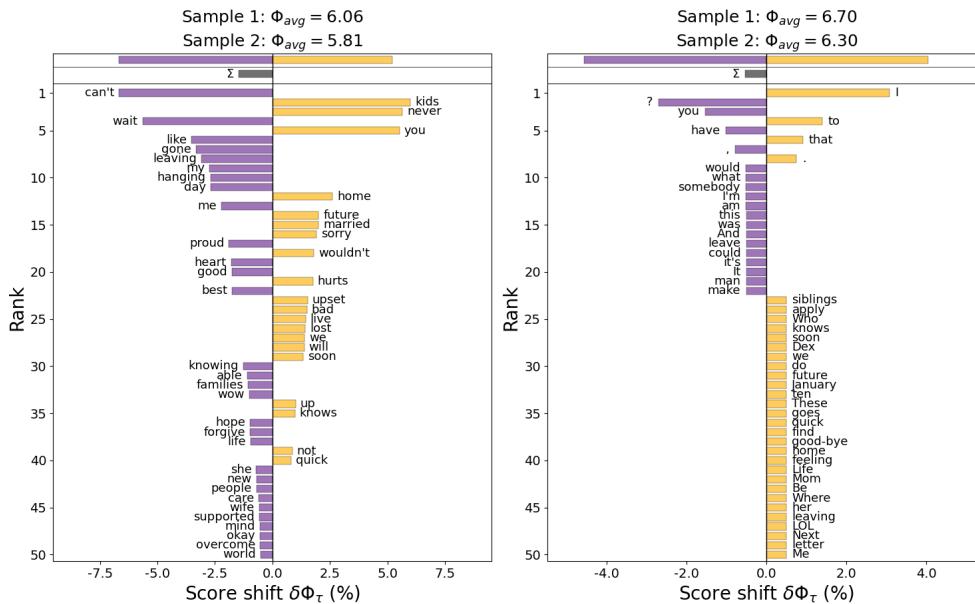
Total n-grams: 172

Total unique n-grams: 104

Lensing Window: [4, 6]

Reference Happiness: 5.505

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 445

Total unique n-grams: 175

Sample 2:

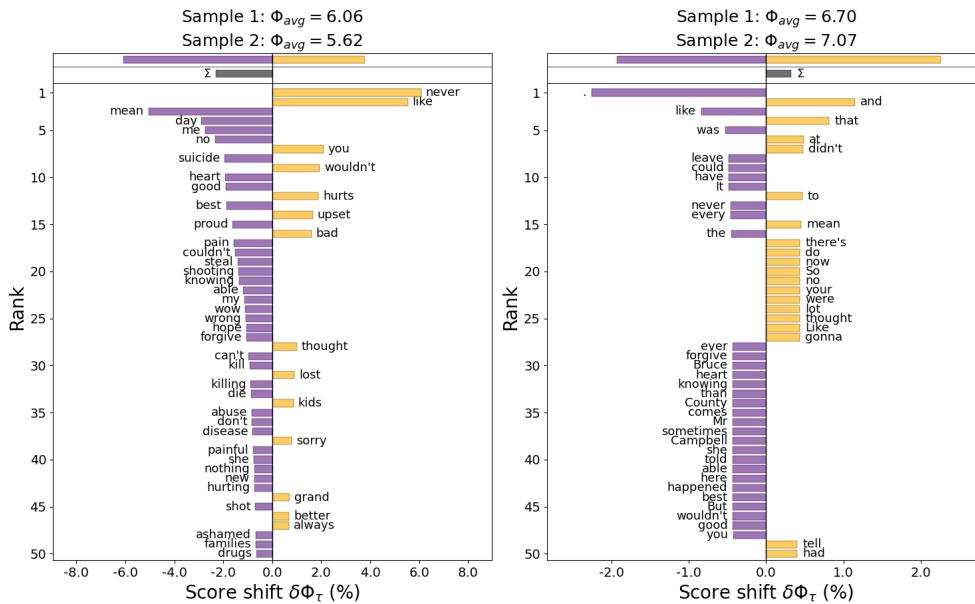
Total n-grams: 1,051

Total unique n-grams: 320

Lensing Window: [4, 6]

Reference Happiness: 5.505

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 445

Total unique n-grams: 175

Sample 2:

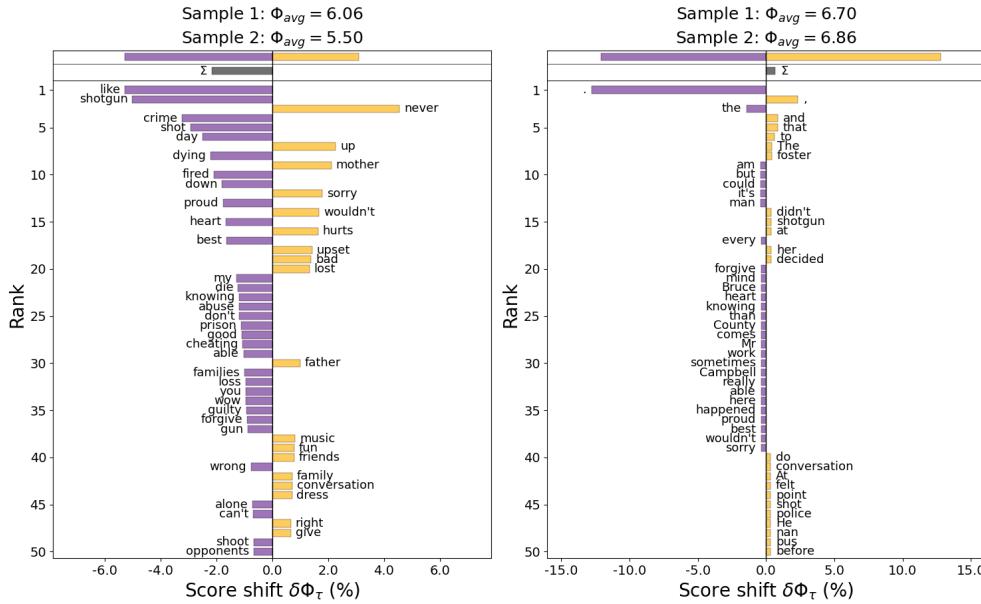
Total n-grams: 787

Total unique n-grams: 300

Lensing Window: [4, 6]

Reference Happiness: 5.505

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 445

Total unique n-grams: 175

Sample 2:

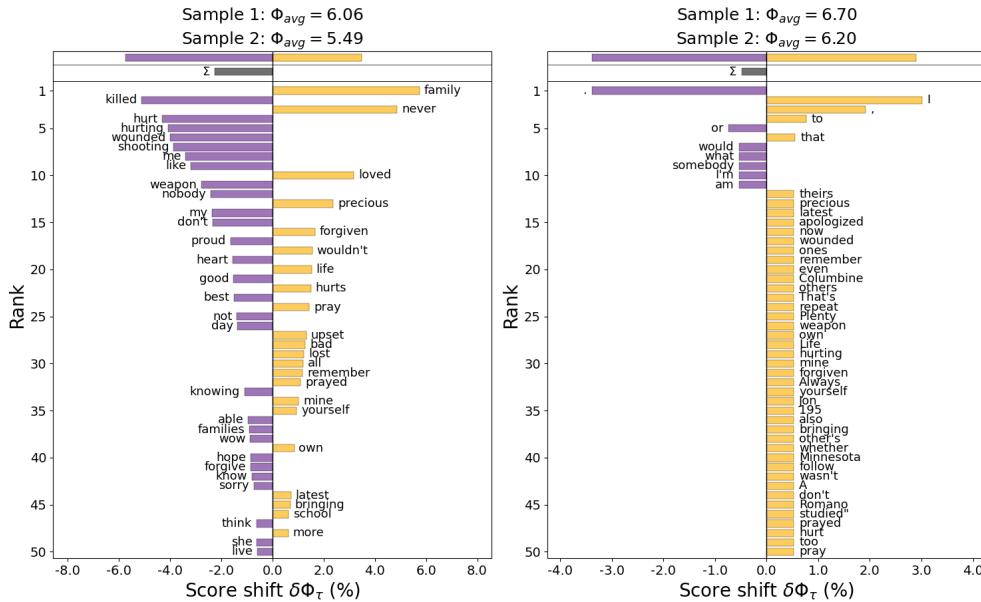
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.505

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 445

Total unique n-grams: 175

Sample 2:

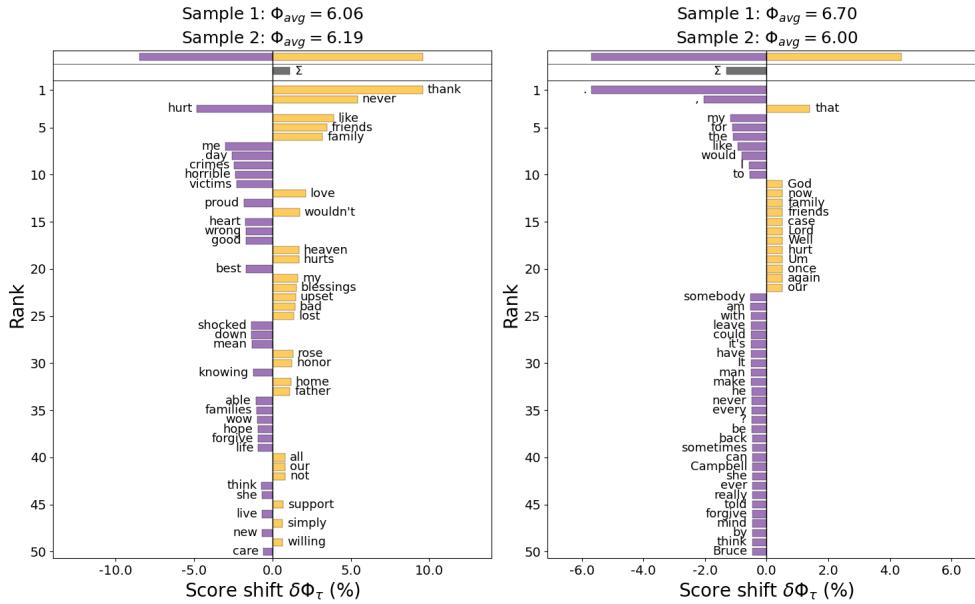
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.505

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 445

Total unique n-grams: 175

Sample 2:

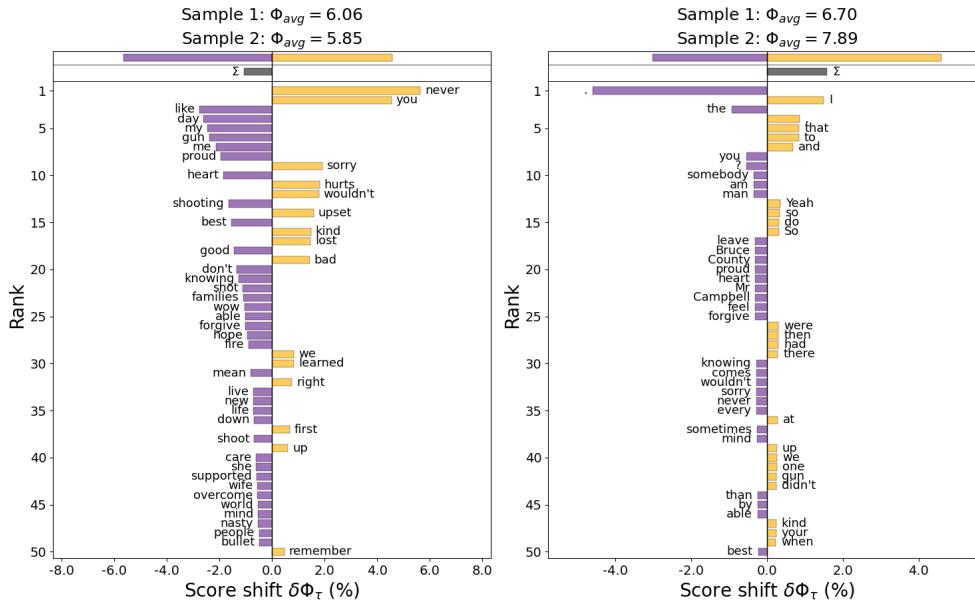
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.505

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



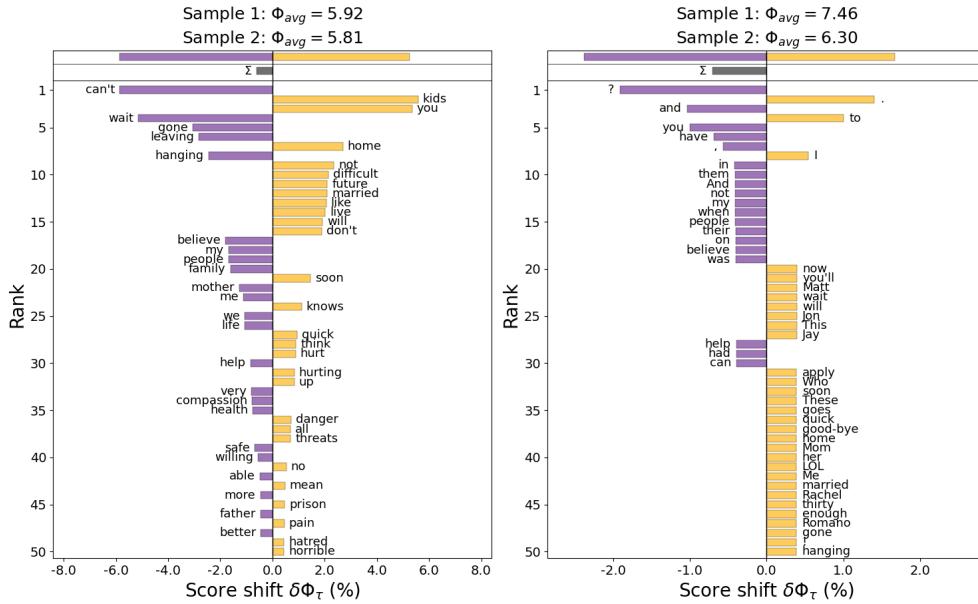
Sample 1:

Total n-grams: 1,509  
Total unique n-grams: 415

Sample 2:

Total n-grams: 172  
Total unique n-grams: 104  
Lensing Window: [4, 6]  
Reference Happiness: 5.400

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



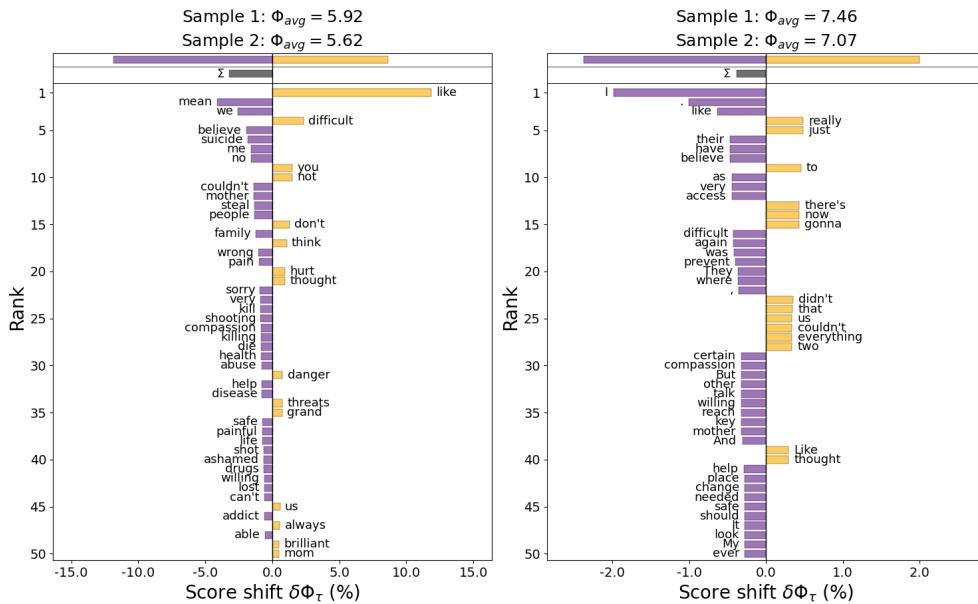
Sample 1:

Total n-grams: 1,509  
Total unique n-grams: 415

Sample 2:

Total n-grams: 1,051  
Total unique n-grams: 320  
Lensing Window: [4, 6]  
Reference Happiness: 5.400

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



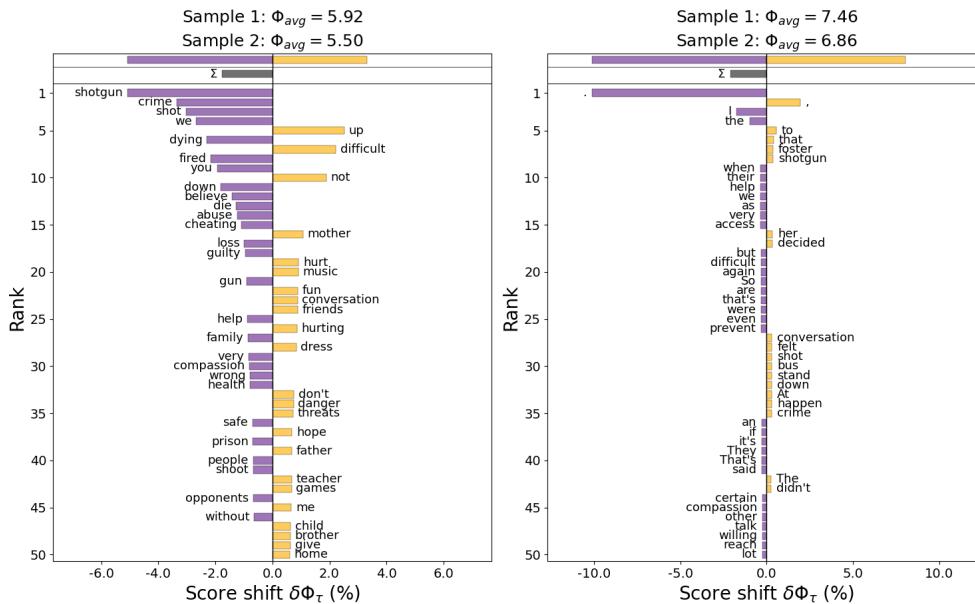
Sample 1:

Total n-grams: 1,509  
Total unique n-grams: 415

Sample 2:

Total n-grams: 787  
Total unique n-grams: 300  
Lensing Window: [4, 6]  
Reference Happiness: 5.400

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



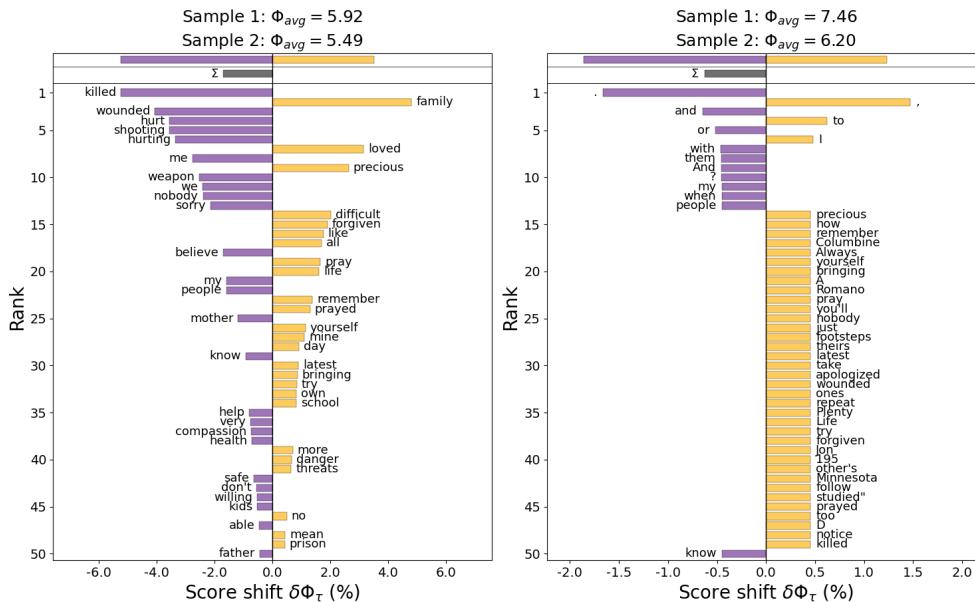
Sample 1:

Total n-grams: 1,509  
Total unique n-grams: 415

Sample 2:

Total n-grams: 146  
Total unique n-grams: 93  
Lensing Window: [4, 6]  
Reference Happiness: 5.400

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



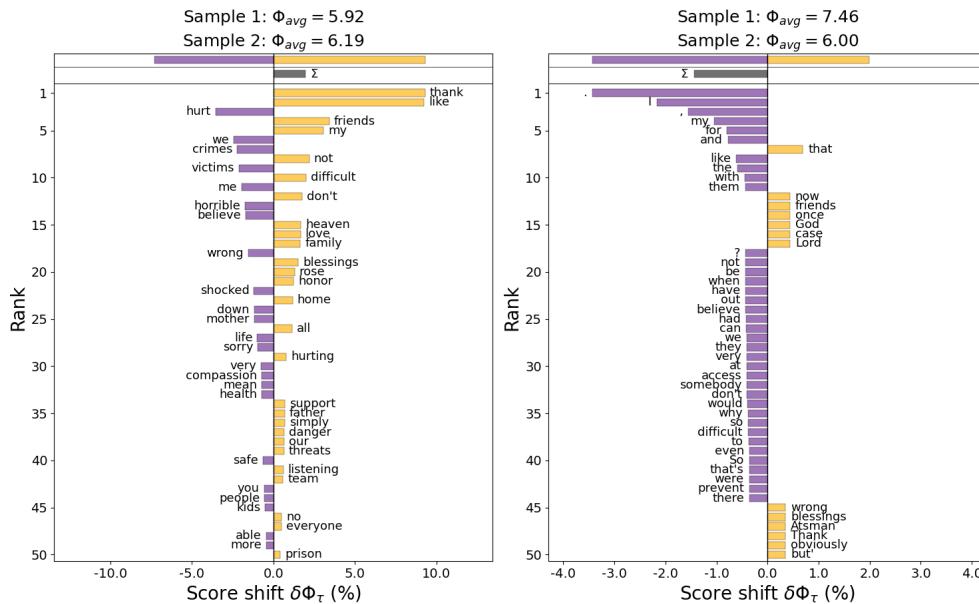
Sample 1:

Total n-grams: 1,509  
Total unique n-grams: 415

Sample 2:

Total n-grams: 266  
Total unique n-grams: 113  
Lensing Window: [4, 6]  
Reference Happiness: 5.400

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



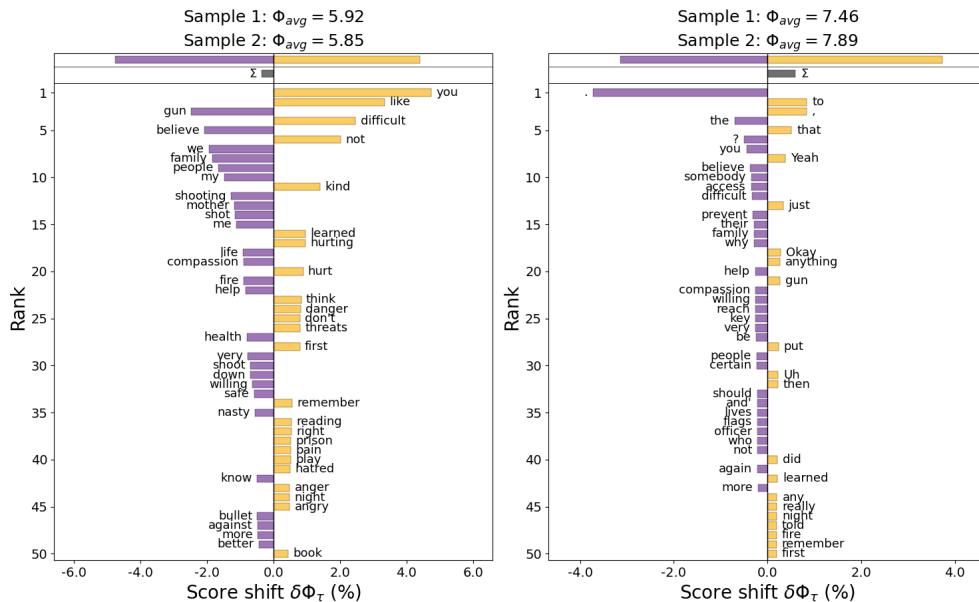
Sample 1:

Total n-grams: 1,509  
Total unique n-grams: 415

Sample 2:

Total n-grams: 8,551  
Total unique n-grams: 1,314  
Lensing Window: [4, 6]  
Reference Happiness: 5.400

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 172

Total unique n-grams: 104

Sample 2:

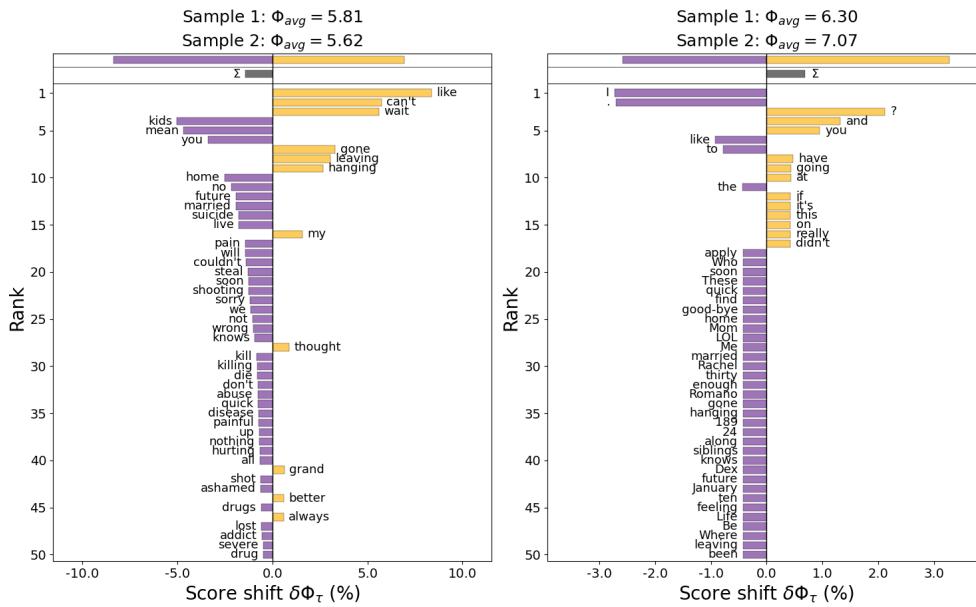
Total n-grams: 1,051

Total unique n-grams: 320

Lensing Window: [4, 6]

Reference Happiness: 5.531

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 172

Total unique n-grams: 104

Sample 2:

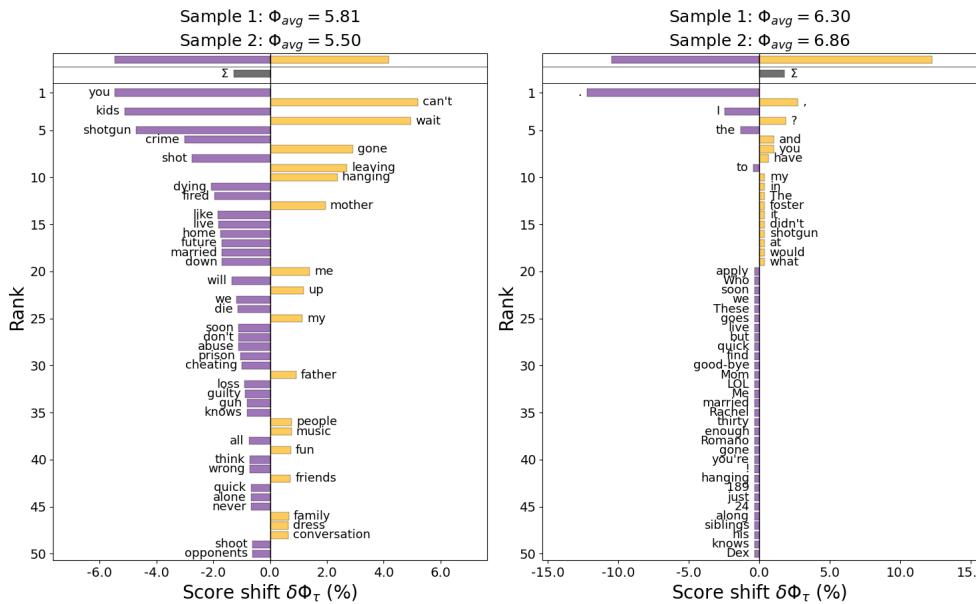
Total n-grams: 787

Total unique n-grams: 300

Lensing Window: [4, 6]

Reference Happiness: 5.531

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 172

Total unique n-grams: 104

Sample 2:

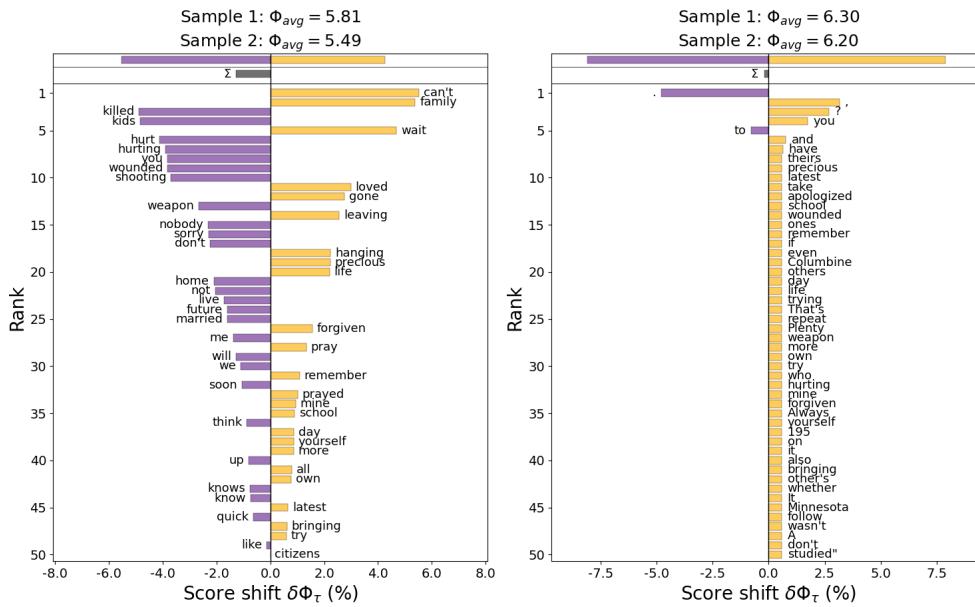
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.531

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 172

Total unique n-grams: 104

Sample 2:

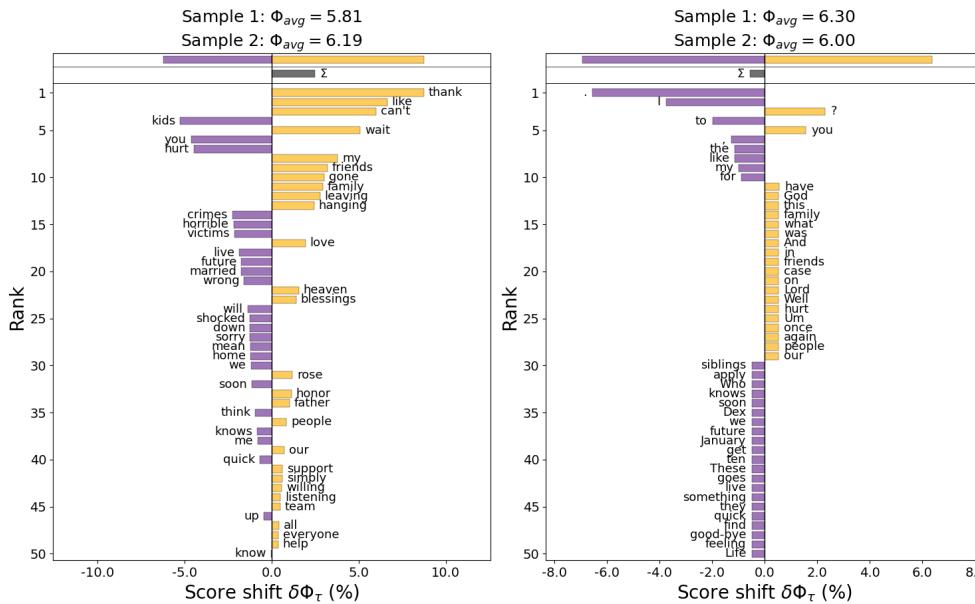
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.531

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 172

Total unique n-grams: 104

Sample 2:

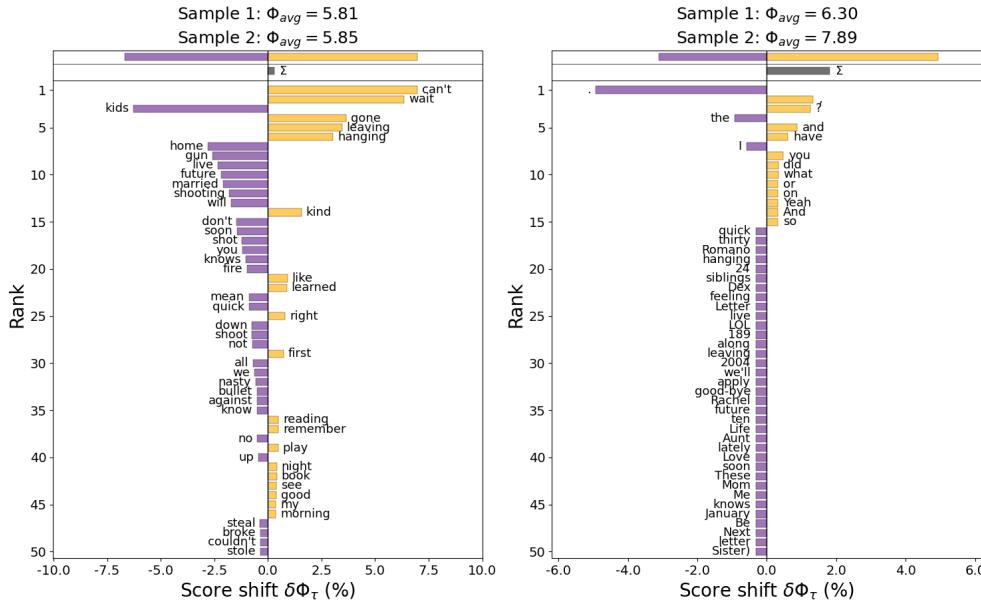
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.531

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,051

Total unique n-grams: 320

Sample 2:

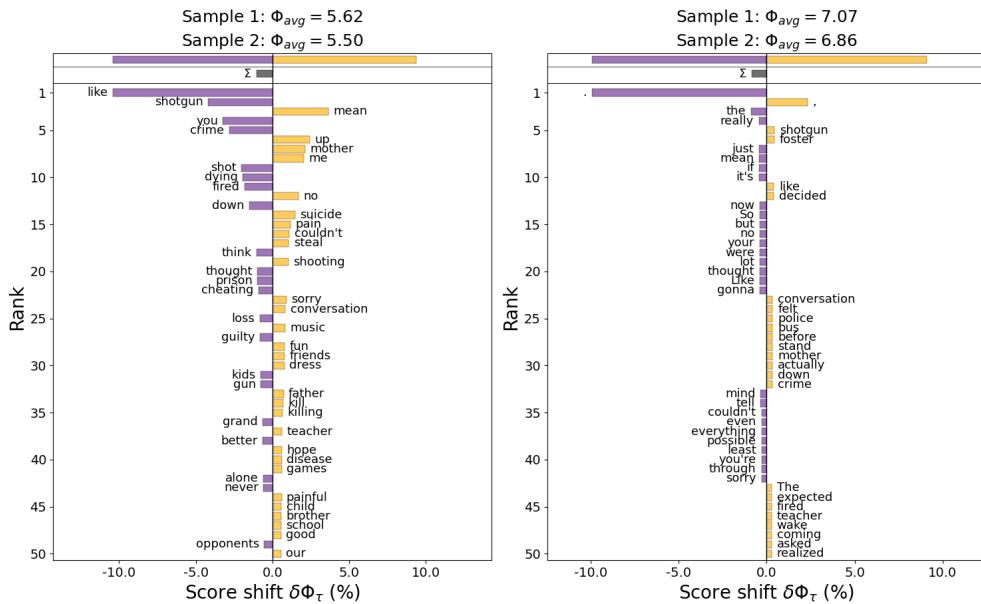
Total n-grams: 787

Total unique n-grams: 300

Lensing Window: [4, 6]

Reference Happiness: 5.314

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,051

Total unique n-grams: 320

Sample 2:

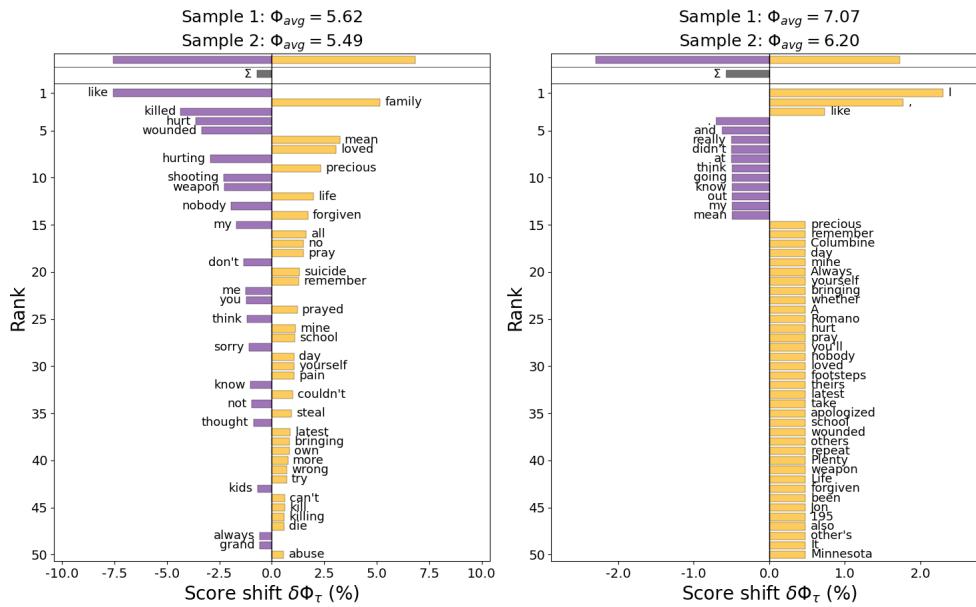
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.314

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,051

Total unique n-grams: 320

Sample 2:

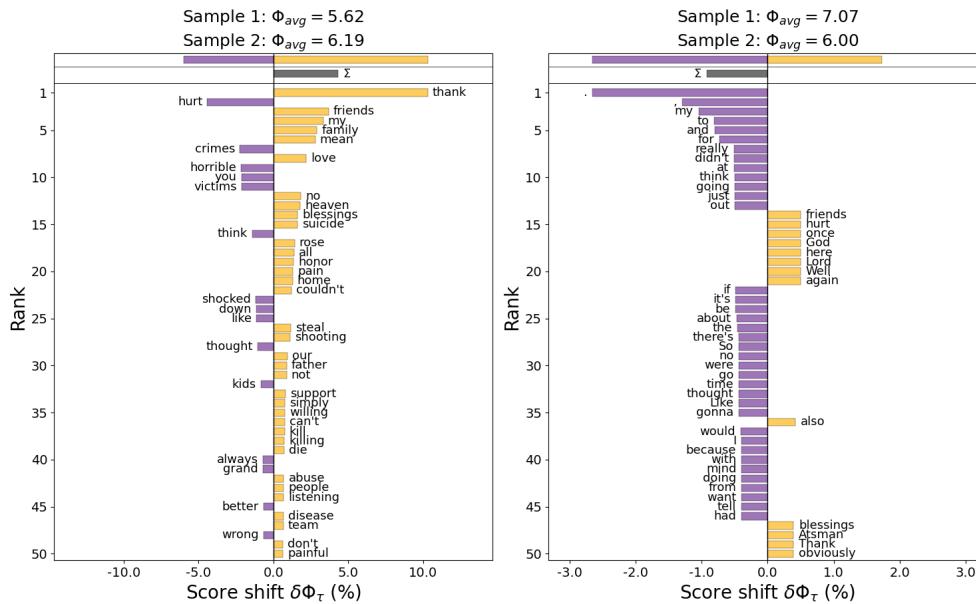
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.314

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 1,051

Total unique n-grams: 320

Sample 2:

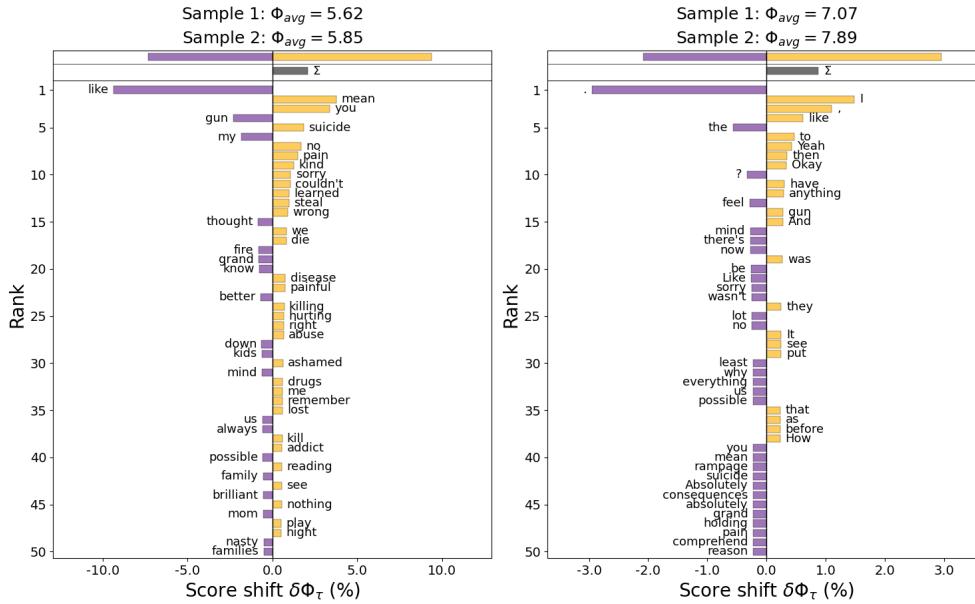
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.314

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 787

Total unique n-grams: 300

Sample 2:

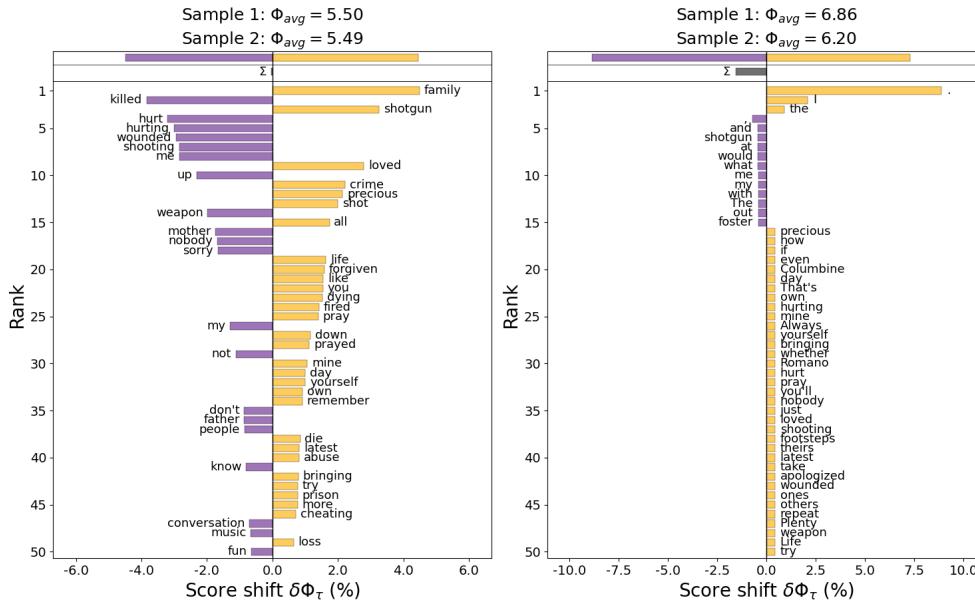
Total n-grams: 146

Total unique n-grams: 93

Lensing Window: [4, 6]

Reference Happiness: 5.269

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 787

Total unique n-grams: 300

Sample 2:

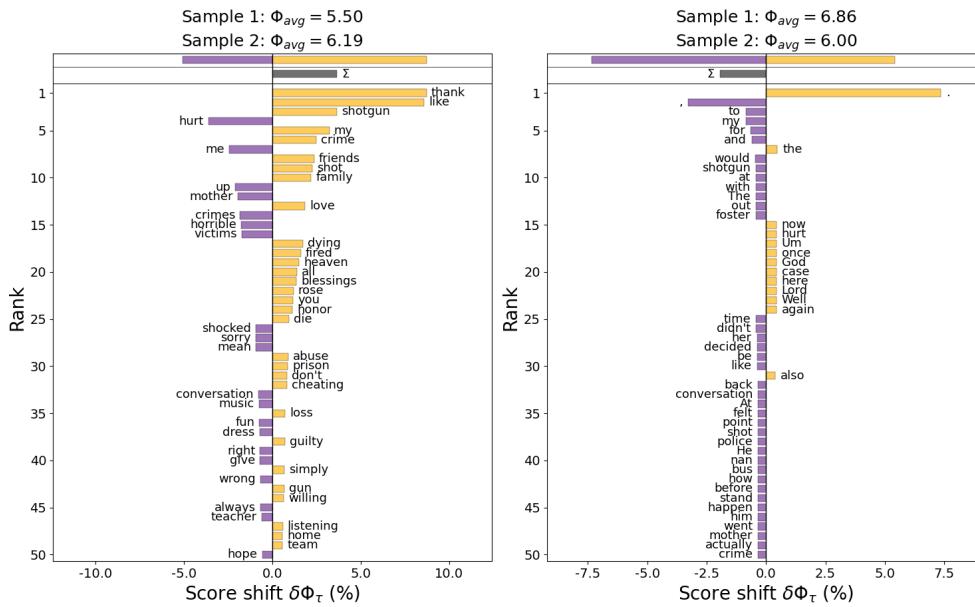
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.269

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 787

Total unique n-grams: 300

Sample 2:

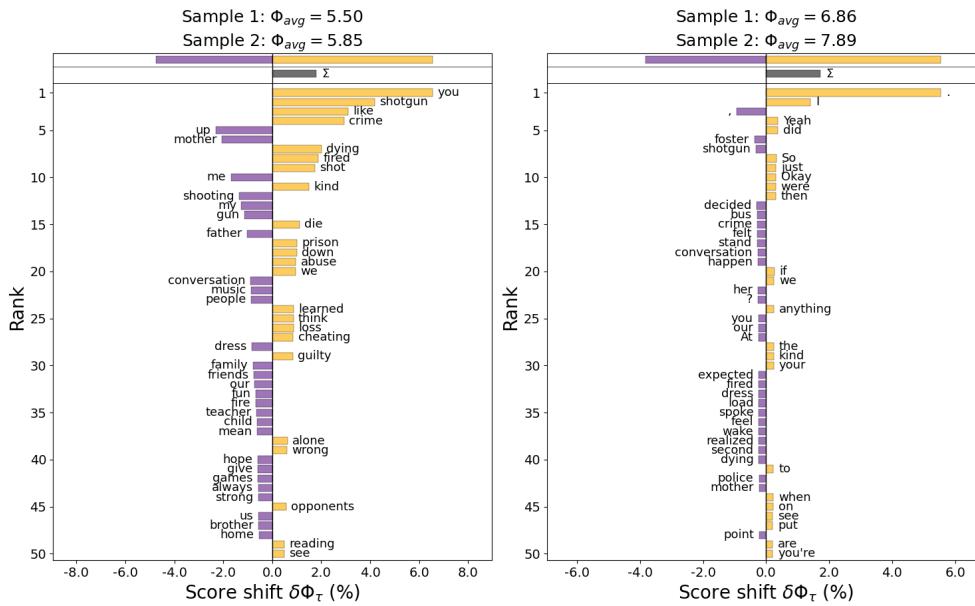
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.269

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 146

Total unique n-grams: 93

Sample 2:

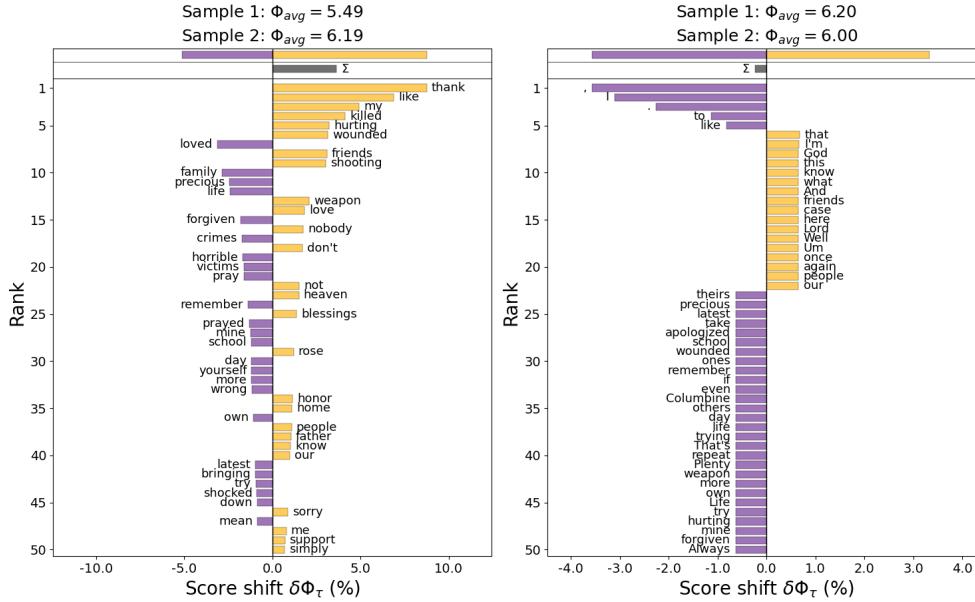
Total n-grams: 266

Total unique n-grams: 113

Lensing Window: [4, 6]

Reference Happiness: 5.194

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 146

Total unique n-grams: 93

Sample 2:

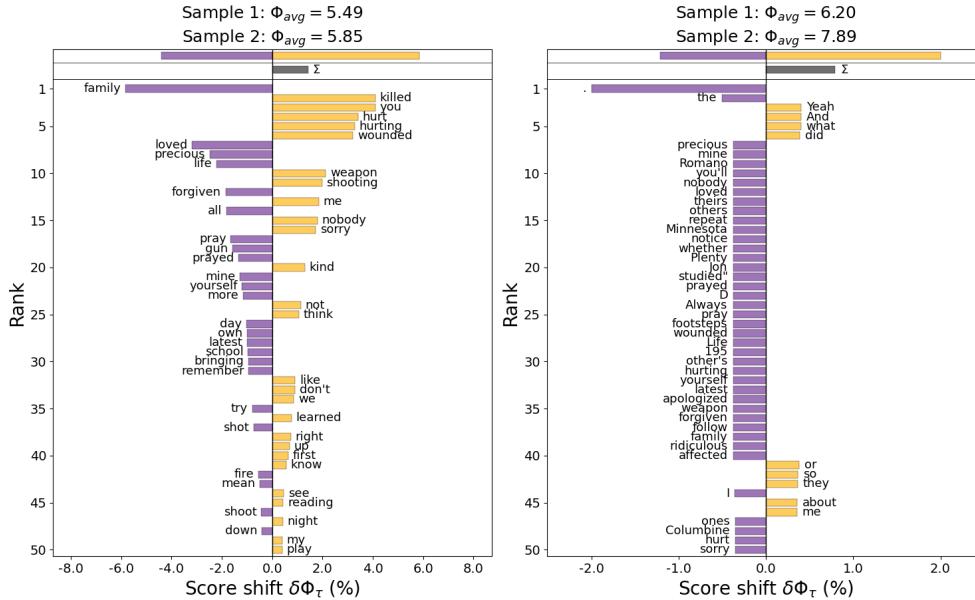
Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.194

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]



Sample 1:

Total n-grams: 266

Total unique n-grams: 113

Sample 2:

Total n-grams: 8,551

Total unique n-grams: 1,314

Lensing Window: [4, 6]

Reference Happiness: 5.556

Weighted Average vs. Entropy Shifts  
Lens: [4, 6]

