

GRAPHS

Simulations of the I-Pod Process

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The following pages contain graphs charting a number of different metrics concerning simulations of the I-Pod Process. The metrics include the popularity of the five most popularity songs (measured by how many users consider it to their favorite), the popularity of the most popular song as measured by the value it is given by the user, and the number of unique favorite songs. All of these metrics are graphed over standardized time.

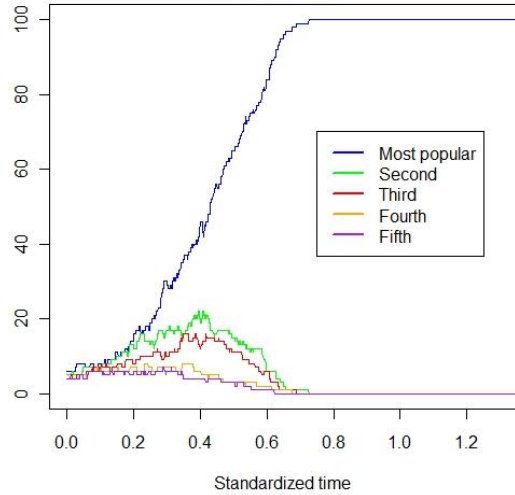
Top 5 Songs

The following graphs chart the popularity of the five most popular songs as measured by the number of users who consider it to be their favorite song, i.e. the five songs with the highest values in the probability distribution of each user. There are graphs for each of the three simulations conducted for the following parameters:

- 100 users, 50 songs, $\eta=0.03$
- 500 users, 400 songs, $\eta=0.03$
- 100 users, 50 songs, $\eta=0.015$
- 500 users, 400 songs, $\eta=0.015$
- 250 users, 100 songs, $\eta=0.03$
- 250 users, 100 songs, $\eta=0.015$
- 100 users, 50 songs, $\eta=0.0075$
- 500 users, 400 songs, $\eta=0.0075$
- 250 users, 100 songs, $\eta=0.0075$

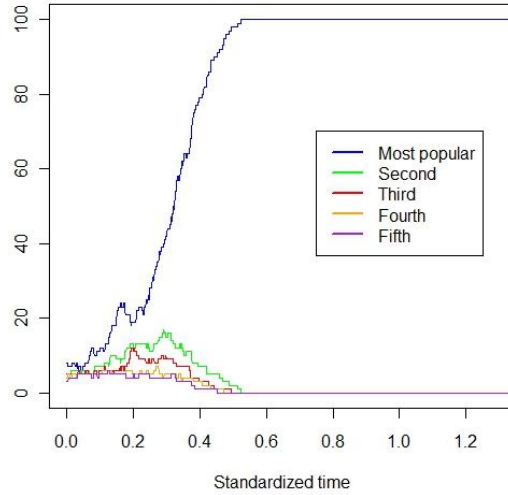
100 users, 50 songs, eta = 0.03

Most Popular Songs
100 users, 50 songs, eta = 0.03
Simulation 1



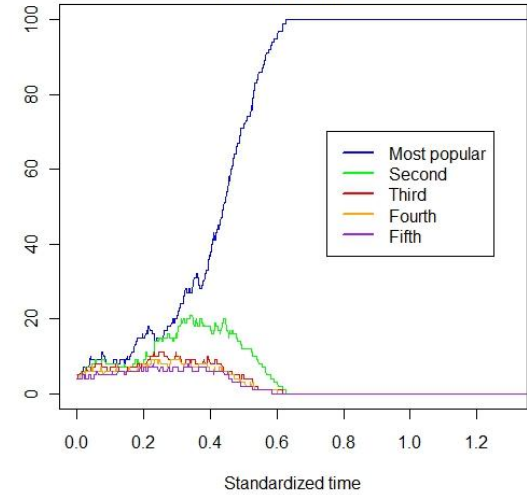
Simulation 1

Most Popular Songs
100 users, 50 songs, eta = 0.03
Simulation 2



Simulation 2

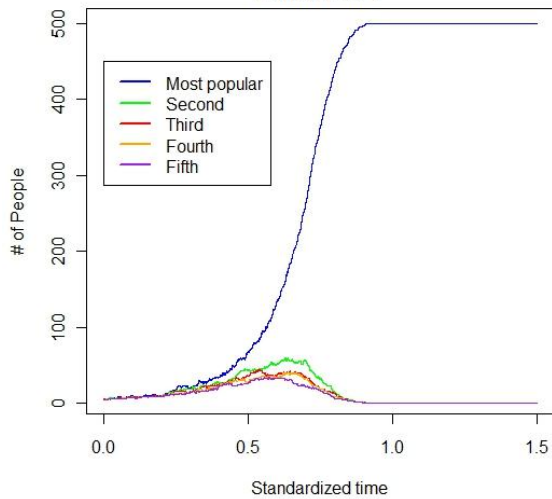
Most Popular Songs
100 users, 50 songs, eta = 0.03
Simulation 3



Simulation 3

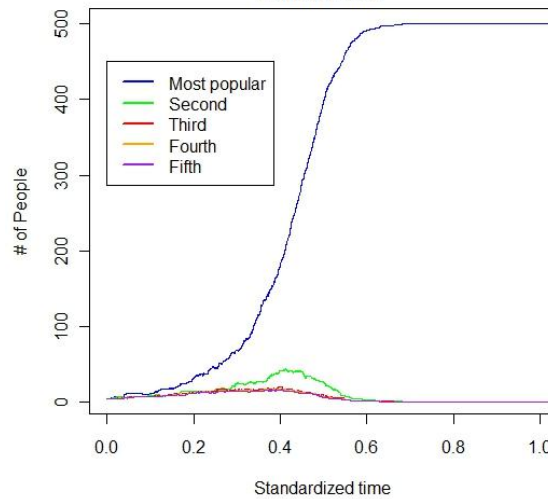
500 users, 400 songs, eta = 0.03

Most Popular Songs
500 users, 400 songs, eta = 0.03,
Simulation 1



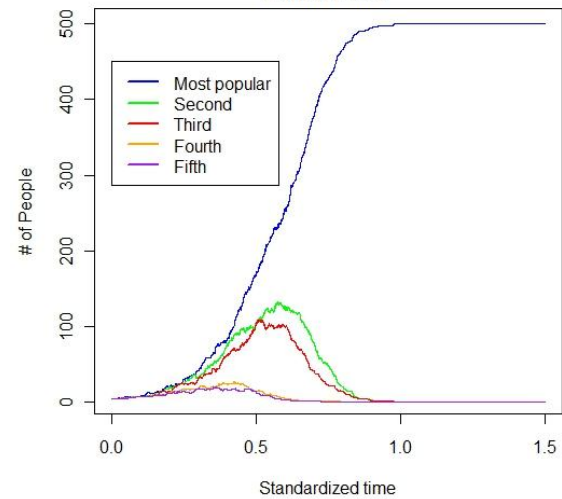
Simulation 1

Most Popular Songs
500 users, 400 songs, eta = 0.03,
Simulation 2



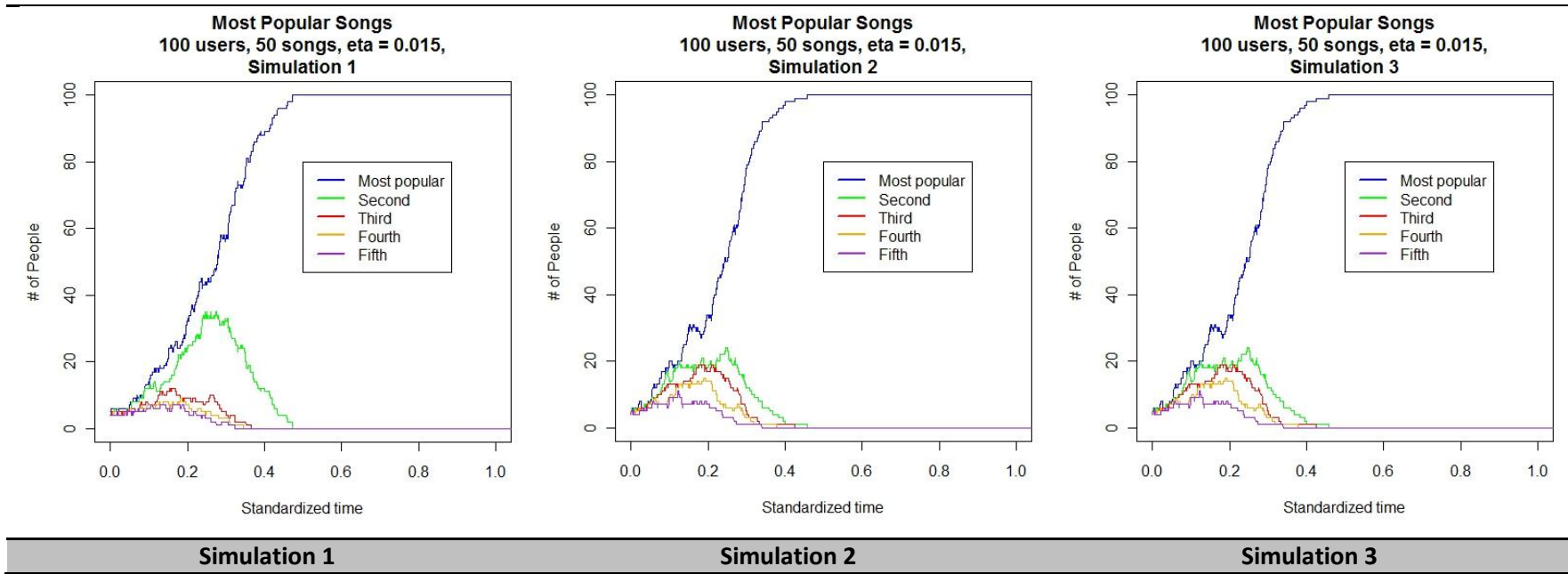
Simulation 2

Most Popular Songs
500 users, 400 songs, eta = 0.03,
Simulation 3

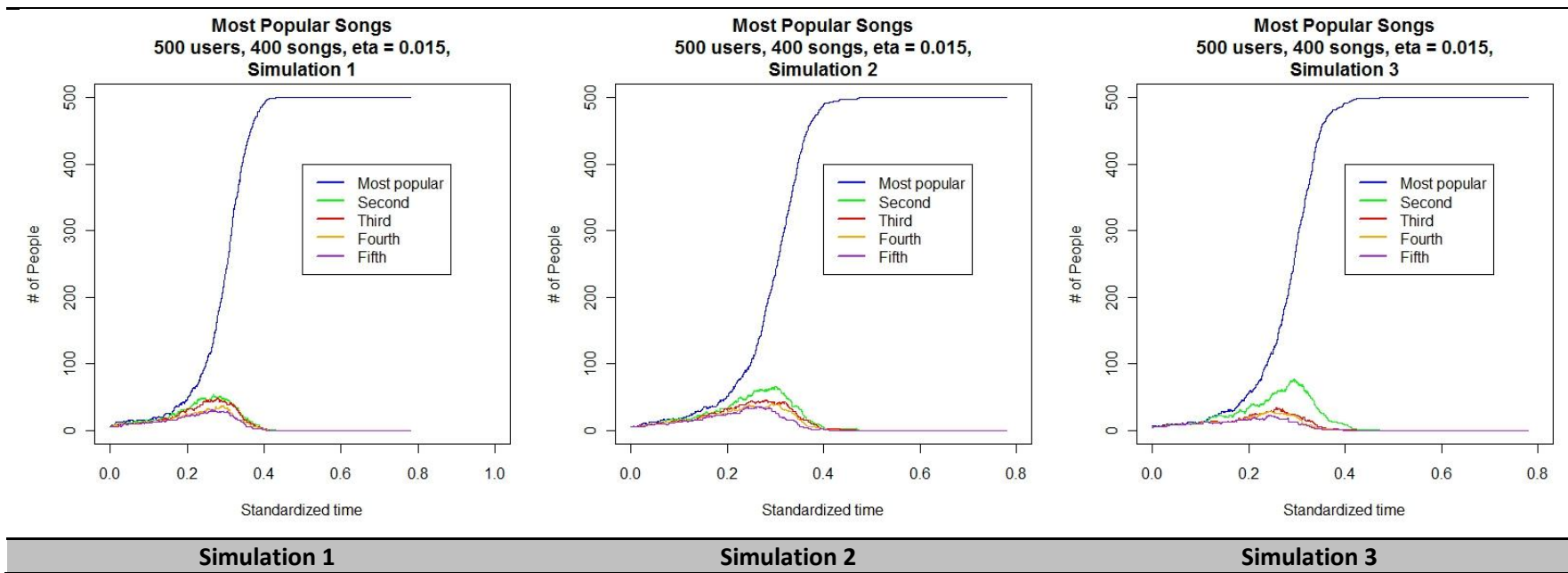


Simulation 3

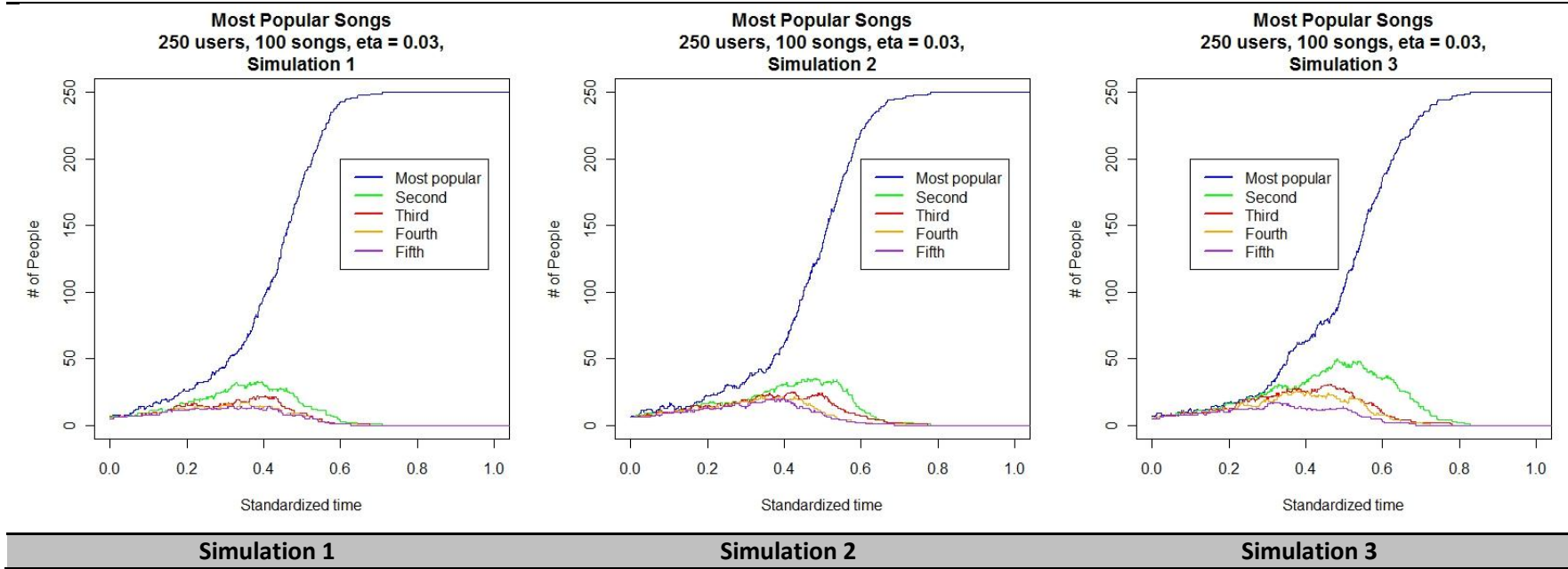
100 users, 50 songs, eta = 0.015



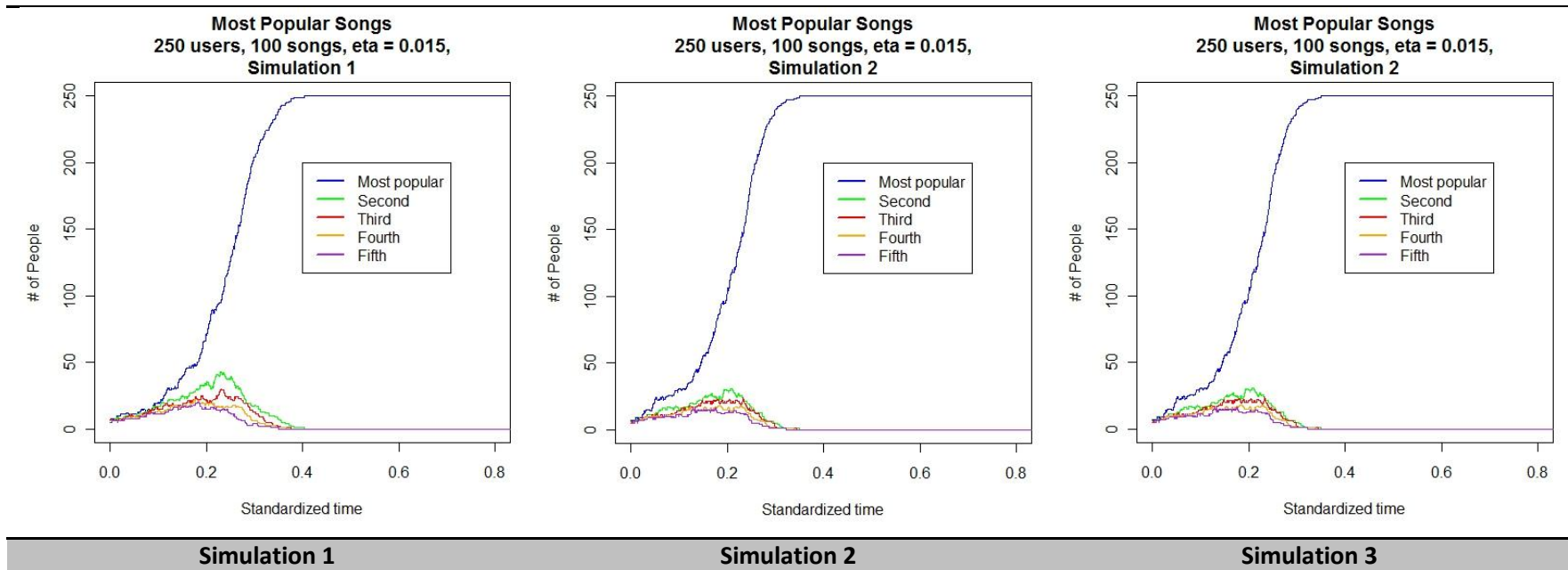
500 users, 400 songs, eta = 0.015



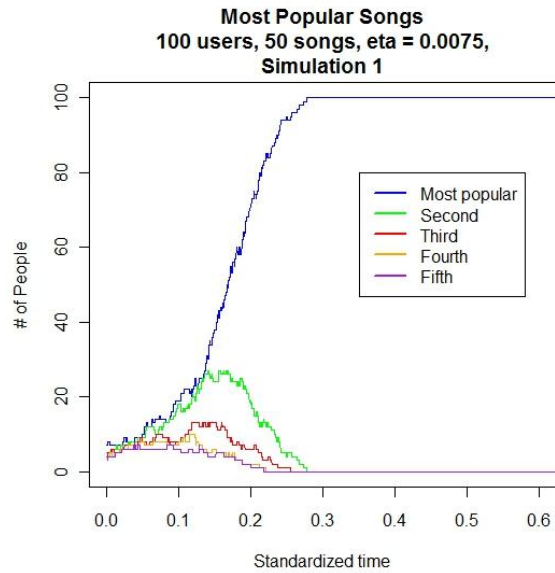
250 users, 100 songs, eta = 0.03



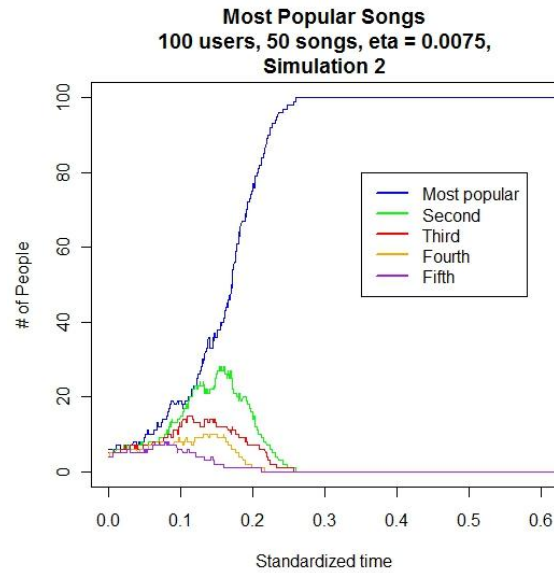
250 users, 100 songs, eta = 0.015



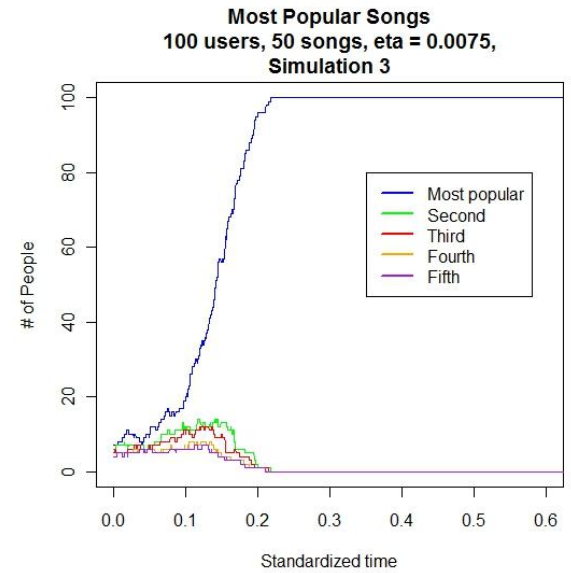
100 users, 50 songs, $\eta = 0.0075$



Simulation 1

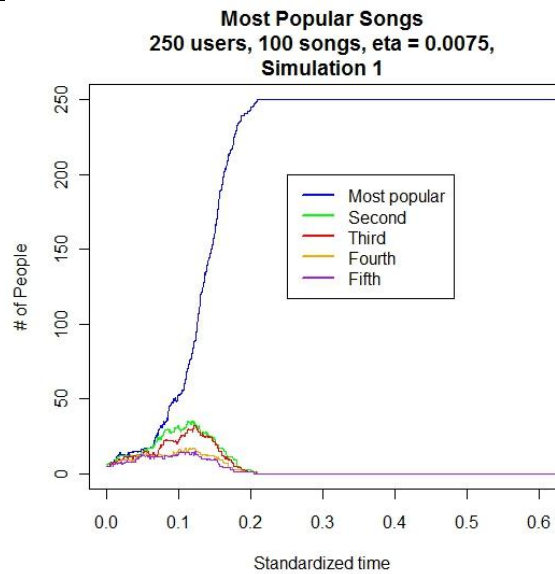


Simulation 2

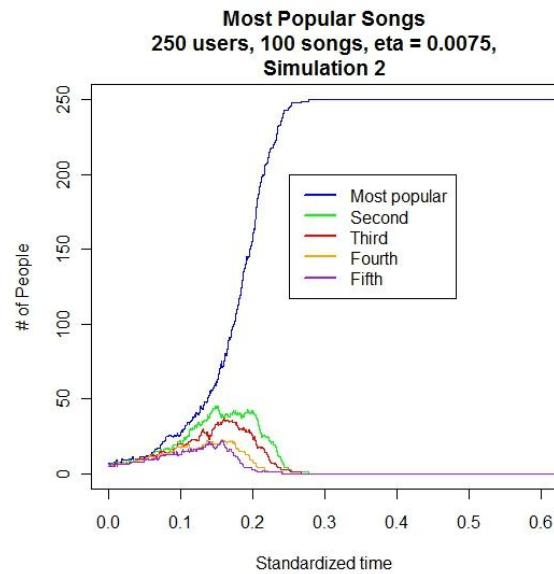


Simulation 3

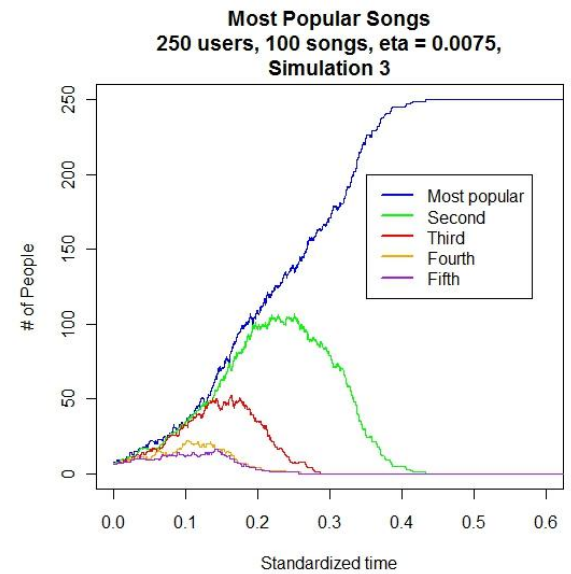
250 users, 100 songs, $\eta = 0.0075$



Simulation 1



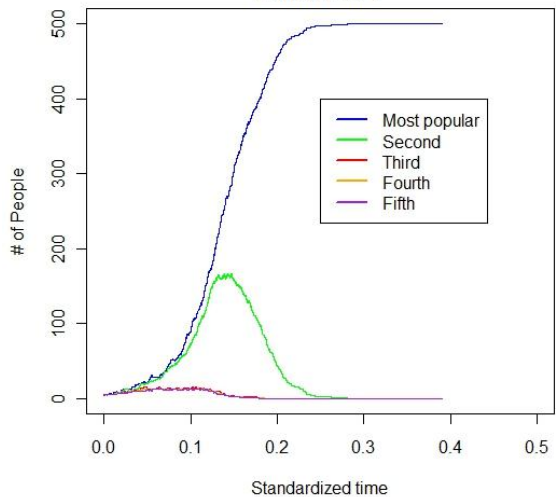
Simulation 2



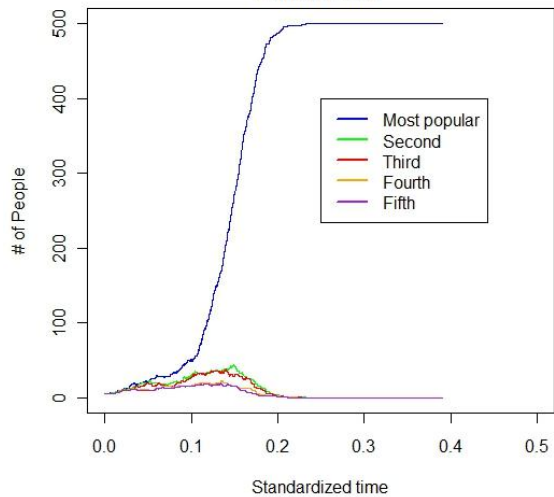
Simulation 3

500 users, 400 songs, eta = 0.0075

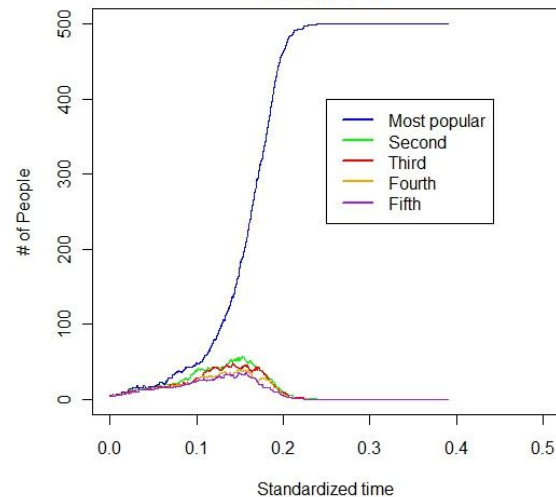
Most Popular Songs
500 users, 400 songs, eta = 0.0075,
Simulation 1



Most Popular Songs
500 users, 400 songs, eta = 0.0075,
Simulation 2



Most Popular Songs
500 users, 400 songs, eta = 0.0075,
Simulation 3



Simulation 1

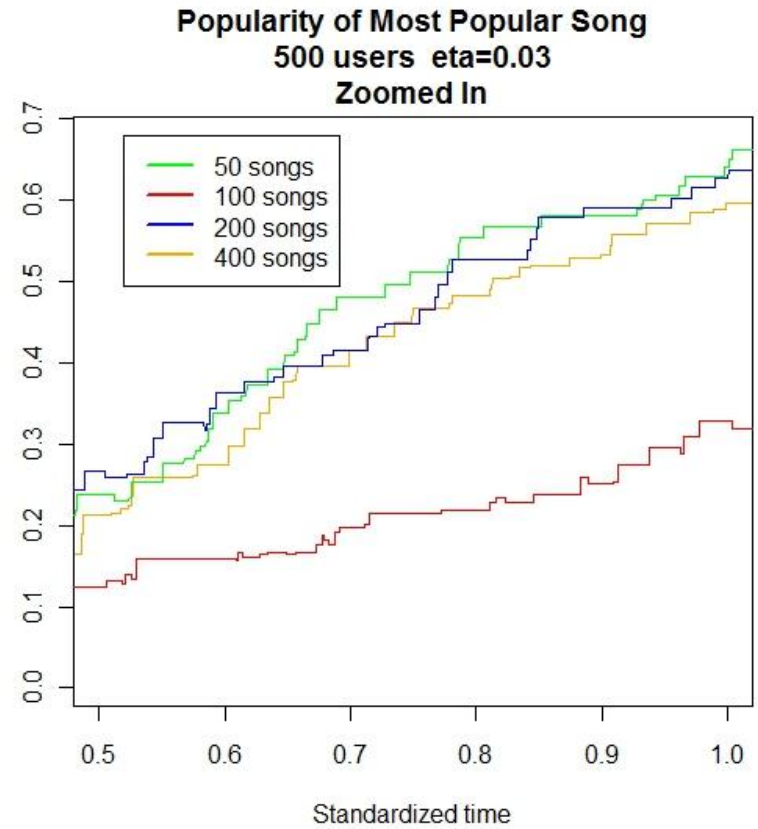
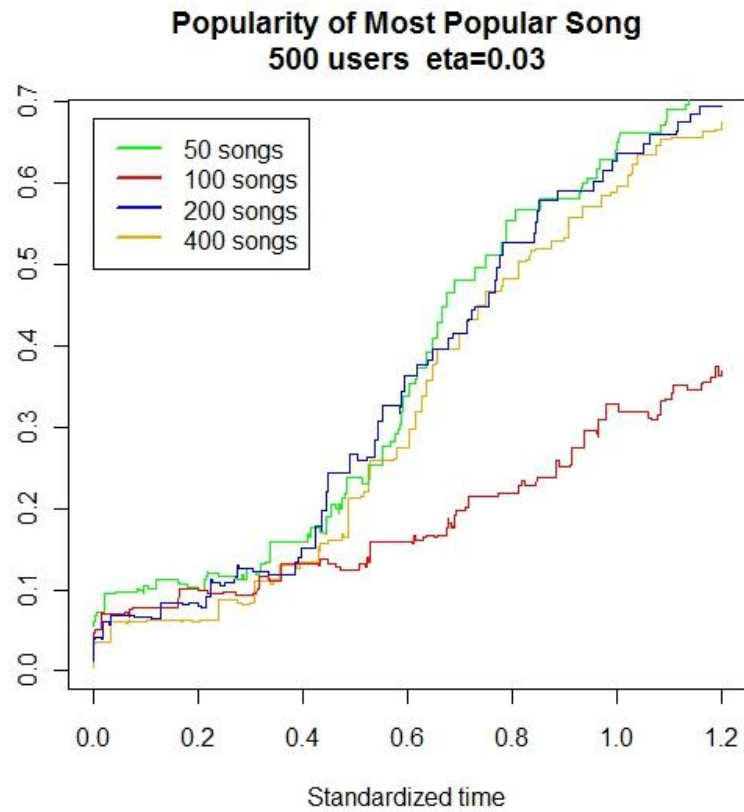
Simulation 2

Simulation 3

The Popularity of the Most Popular Song

The following graphs plot the popularity of the most popular song over standardized time. A song's "popularity" is measured by its probability of selection. The plots reflect simulations of 500 users with 50, 100, 200, and 400 songs. The four variations in the number of songs are each represented in a single graph and distinguished by different colors.

500 users, eta=0.03

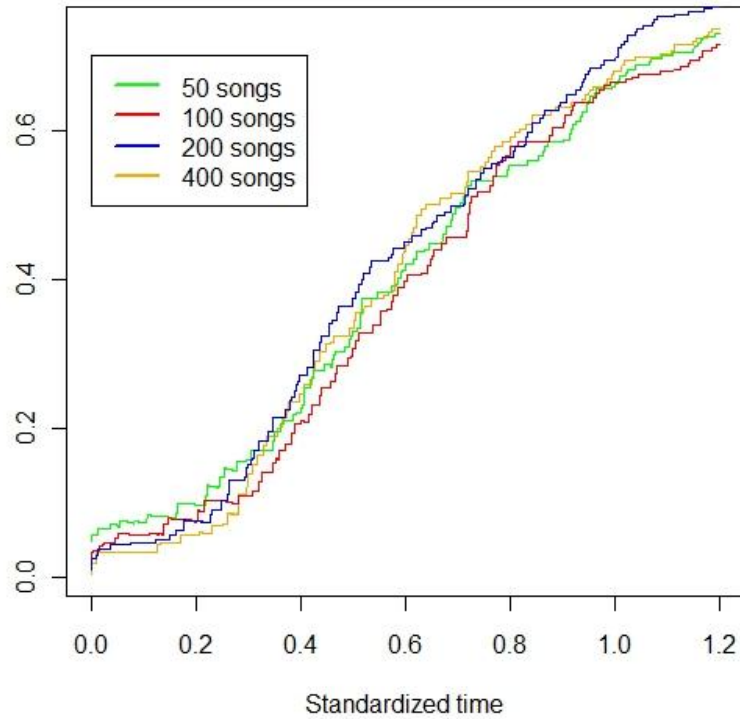


Normal

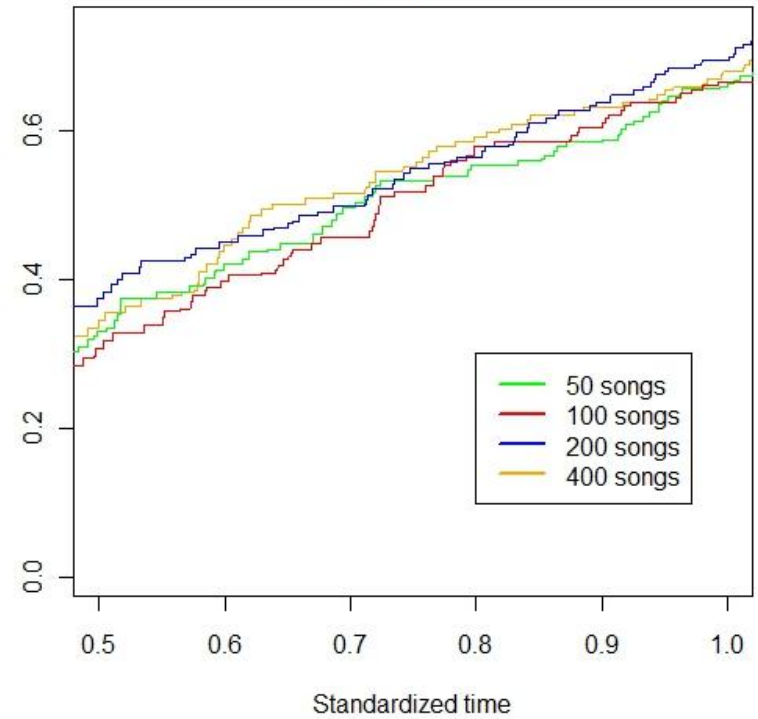
Zoomed In

500 users, $\eta=0.015$

Popularity of Most Popular Song
500 users $\eta=0.015$



Popularity of Most Popular Song
500 users $\eta=0.015$
Zoomed

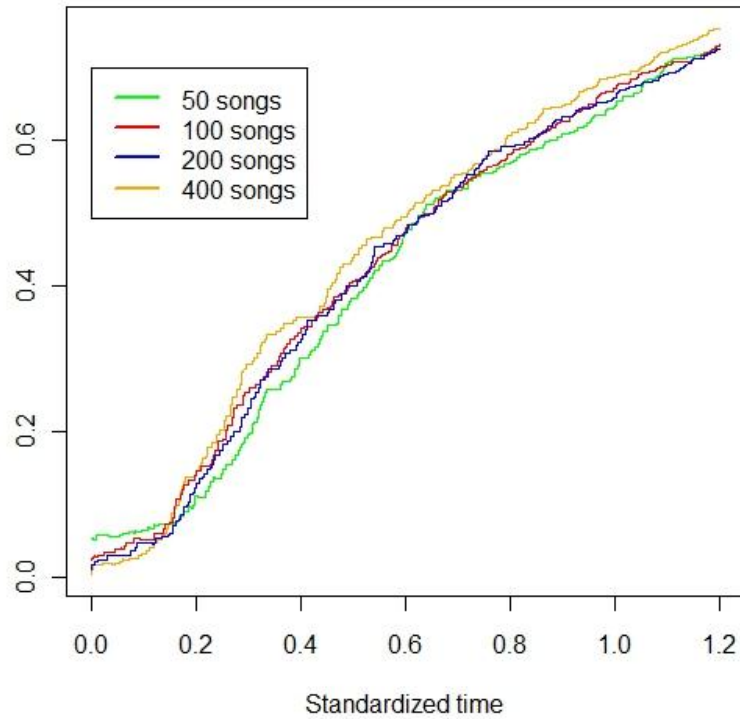


Normal

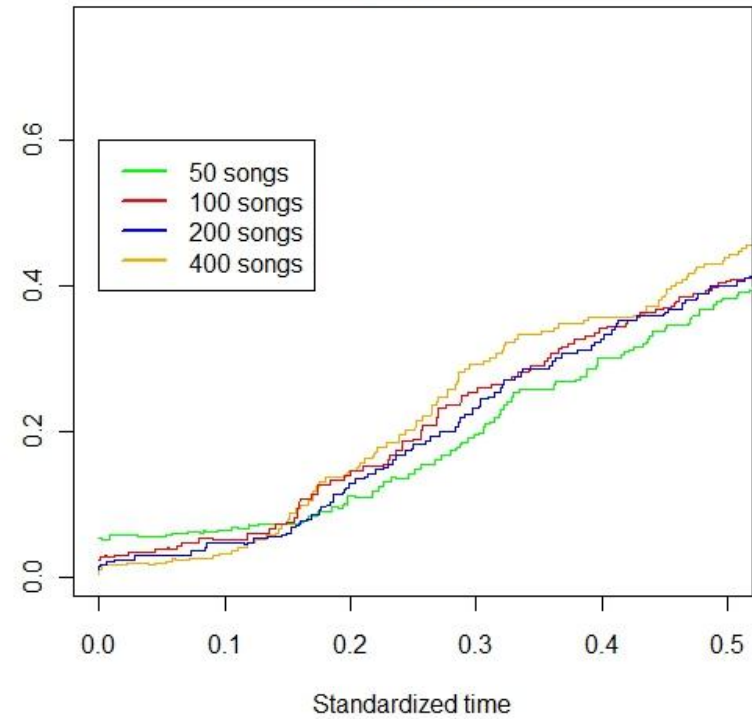
Zoomed In

500 users, $\eta=0.0075$

Popularity of Most Popular Song
500 users $\eta=0.0075$



Popularity of Most Popular Song
500 users $\eta=0.0075$
Zoomed



Normal

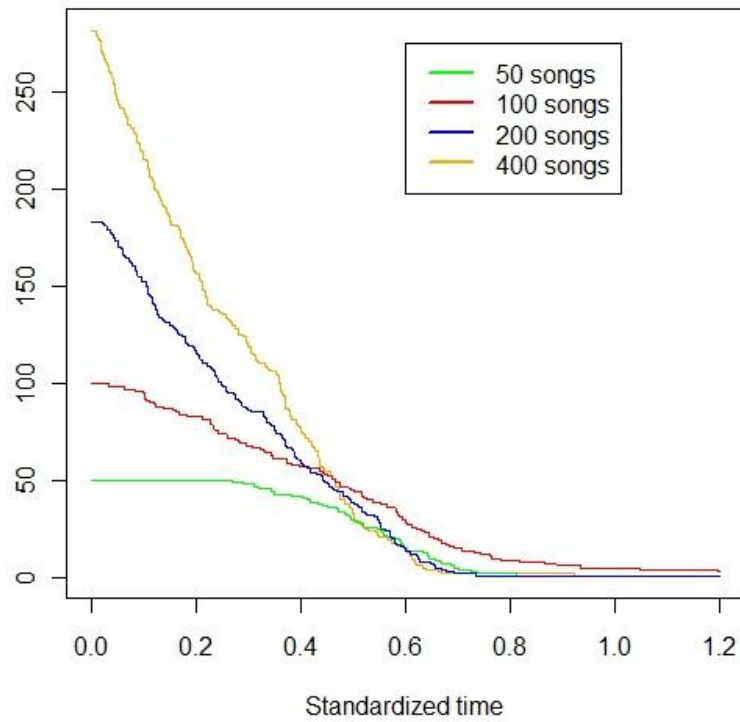
Zoomed In

Number of Unique Favorite Songs

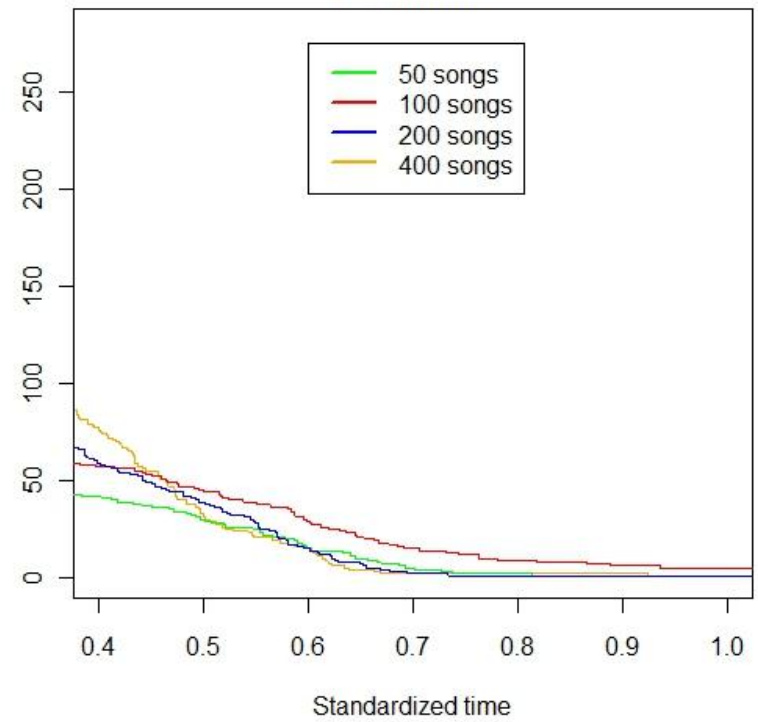
The following graphs plot the number of unique favorite songs amongst 500 users over standardized time. The graphs plot data for simulations with 50 songs, 100 songs, 200 songs, and 400 songs.

500 users, eta=0.03

Number of Unique Favorite Songs
500 users eta=0.03



Number of Unique Favorite Songs
500 users eta=0.03
Zoomed In

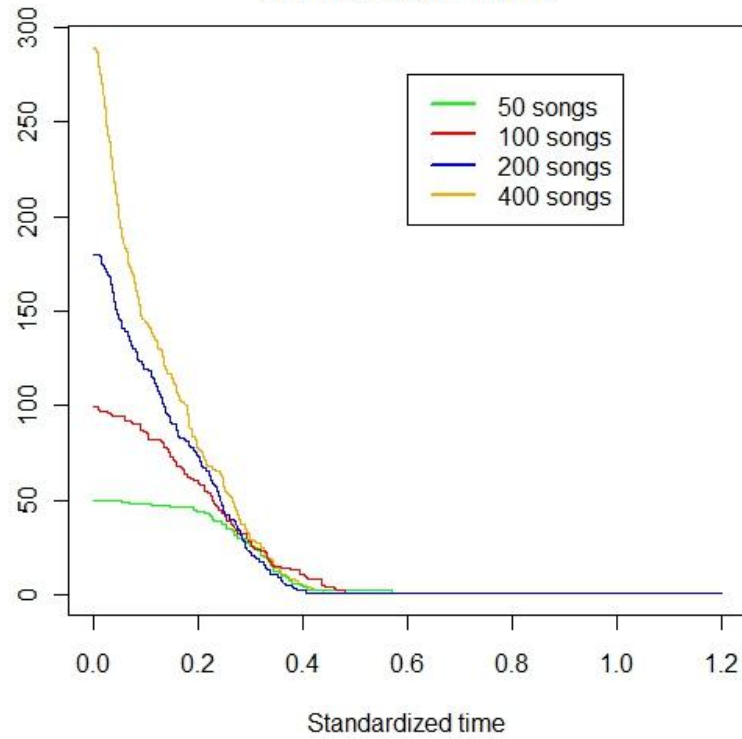


Normal

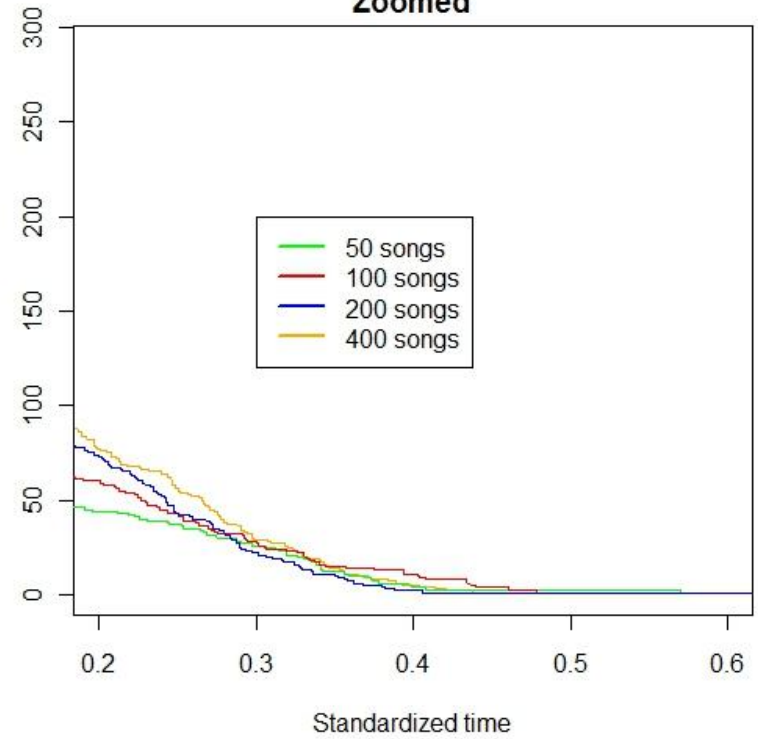
Zoomed In

500 users, $\eta=0.015$

Number of Unique Favorite Songs
500 users $\eta=0.015$



Number of Unique Favorite Songs
500 users $\eta=0.015$
Zoomed

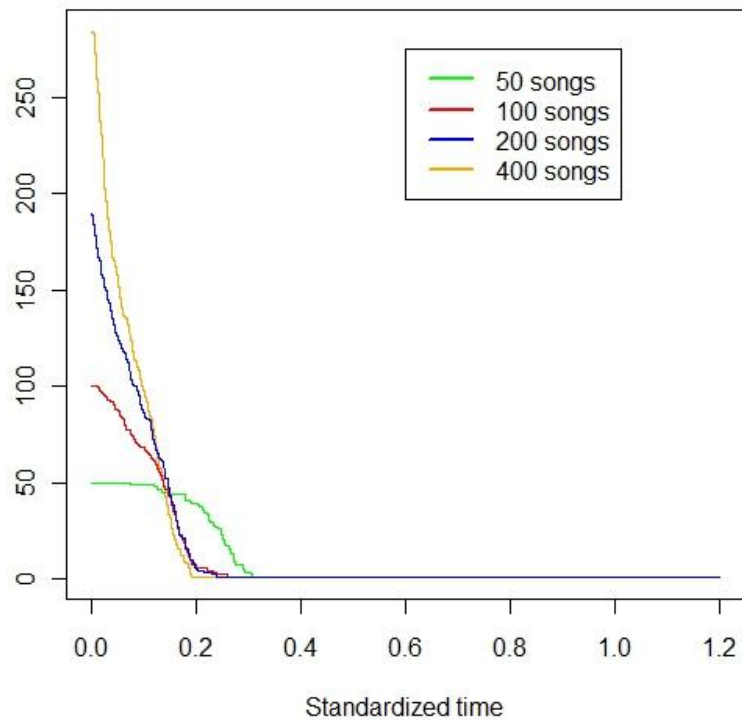


Normal

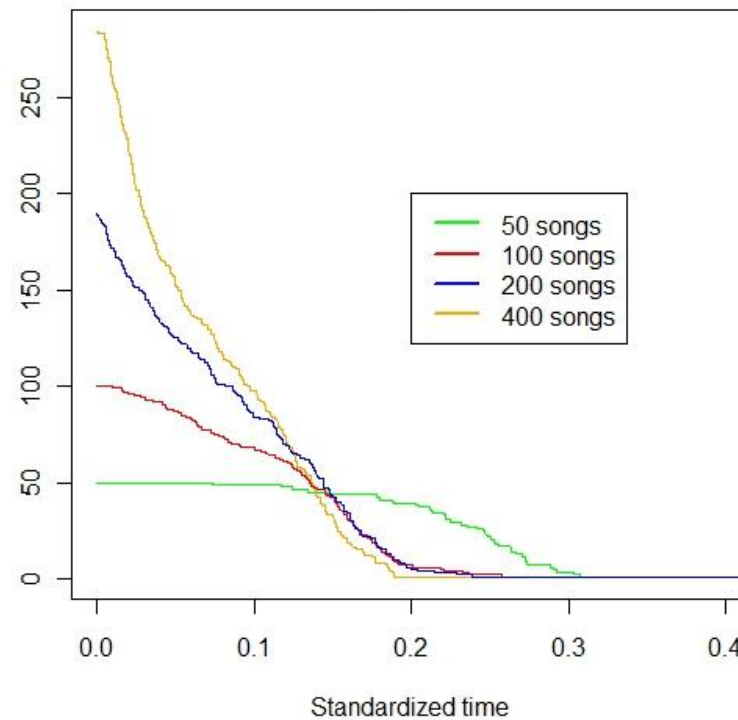
Zoomed In

500 users, eta=0.0075

Number of Unique Favorite Songs
500 users eta=0.0075



Number of Unique Favorite Songs
500 users eta=0.0075
Zoomed



Normal

Zoomed In