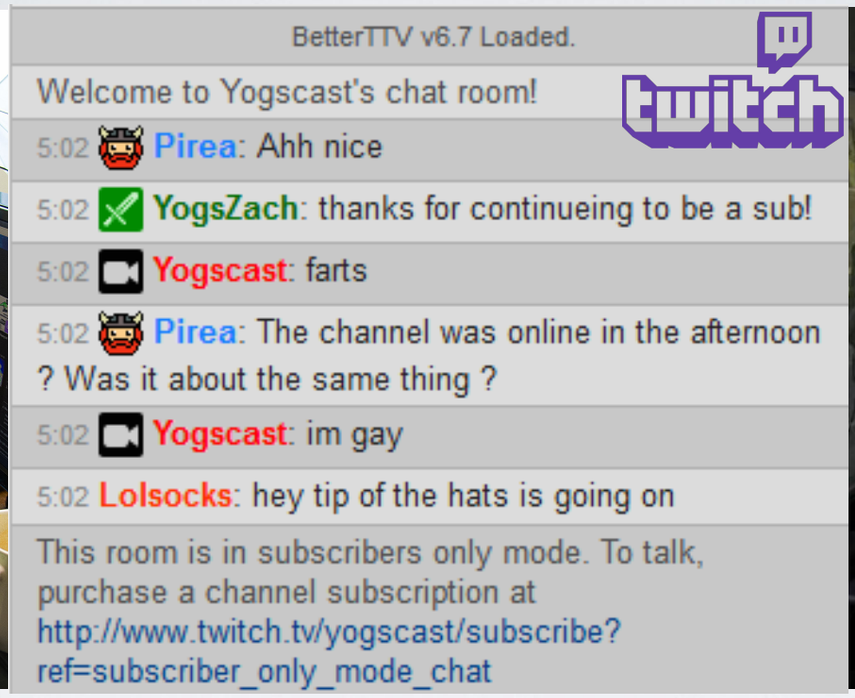


Gendered Conversation in a Social Game-Streaming Platform

Supun Nakandala
Indiana University

Giovanni Ciampaglia

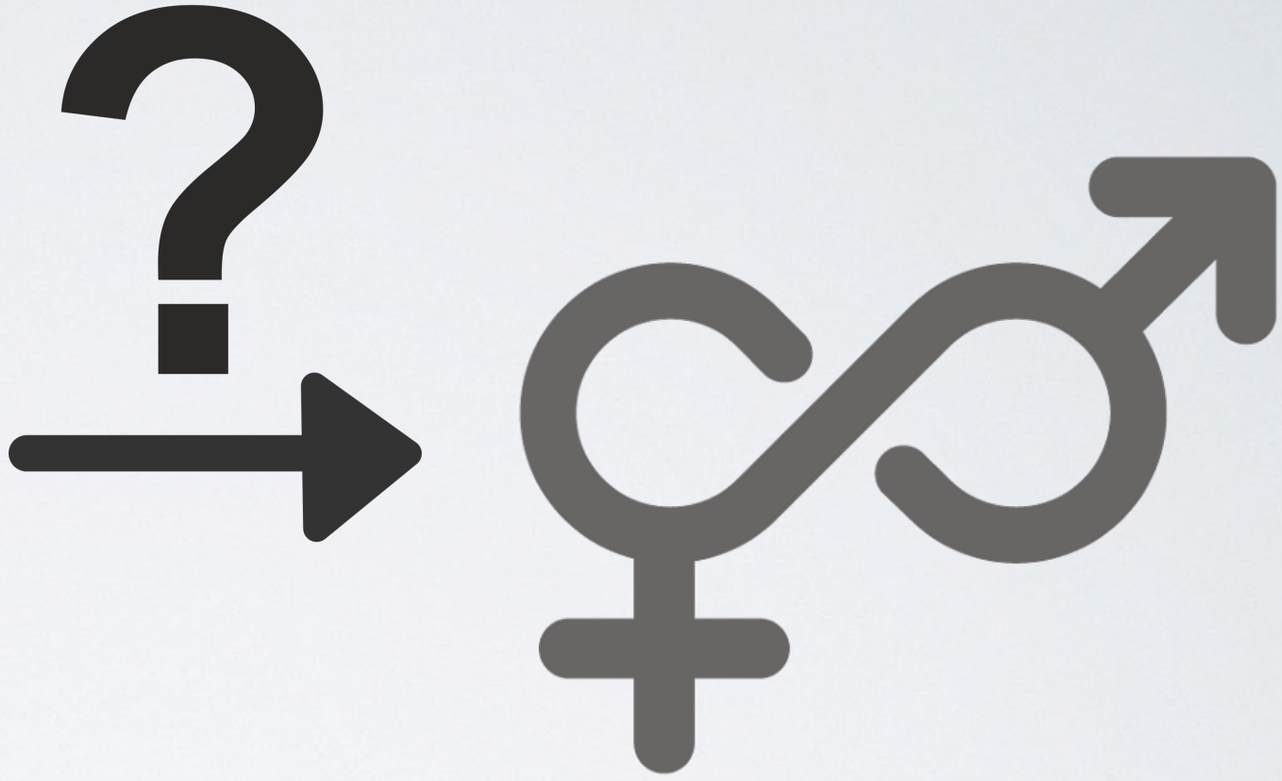
Norman Su

Yong-Yeol Ahn

Indiana University

Gender & Online Platforms

Linked in
foursquare
LiVEJOU
vime
YouTube
facebook
my Blogger
twitter
flickr
tumblr.
yelp



Twitter's Glass Ceiling: The Effect of Perceived Gender on Online Visibility

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Fabio Rojas
Department of Sociology
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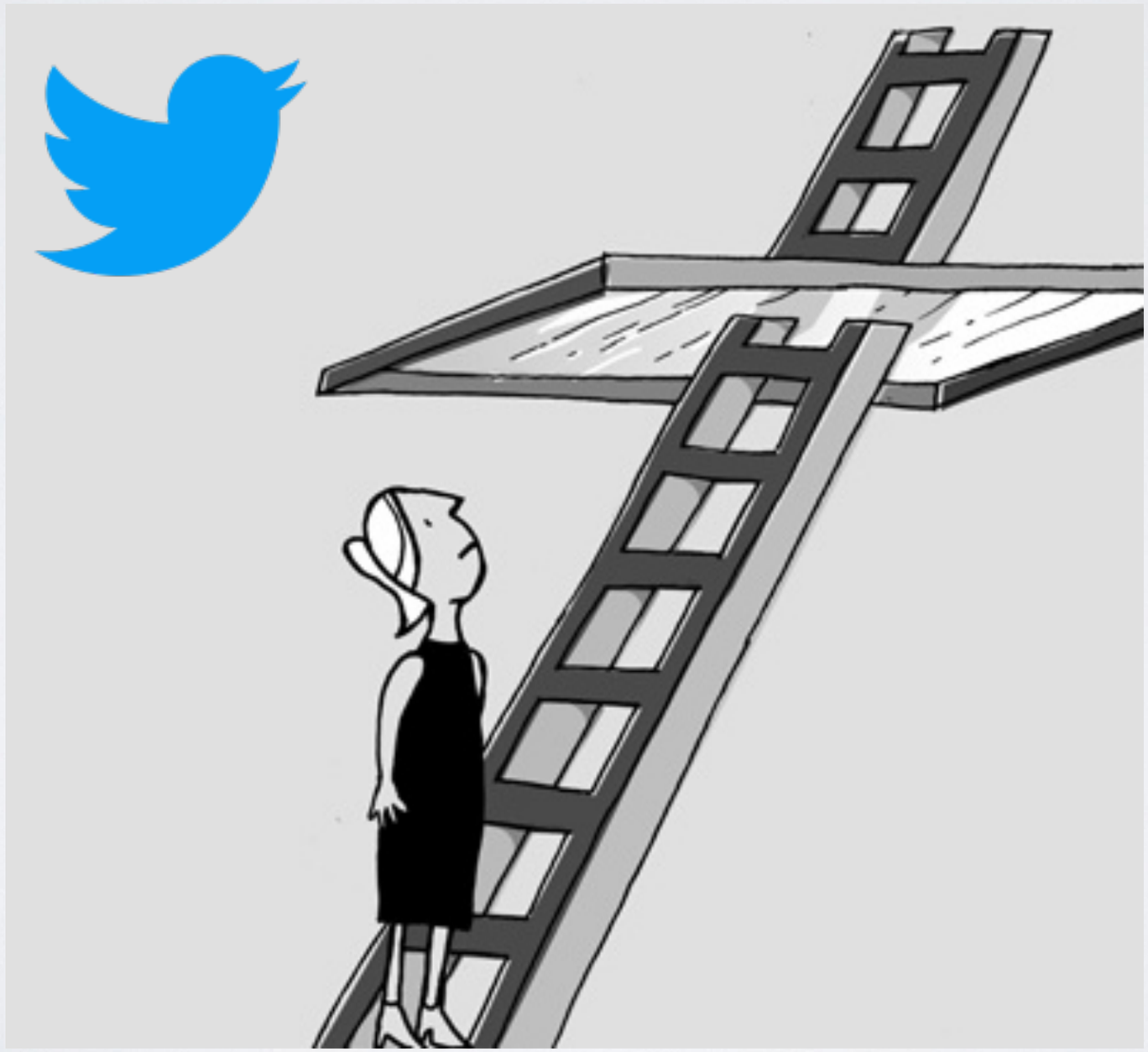
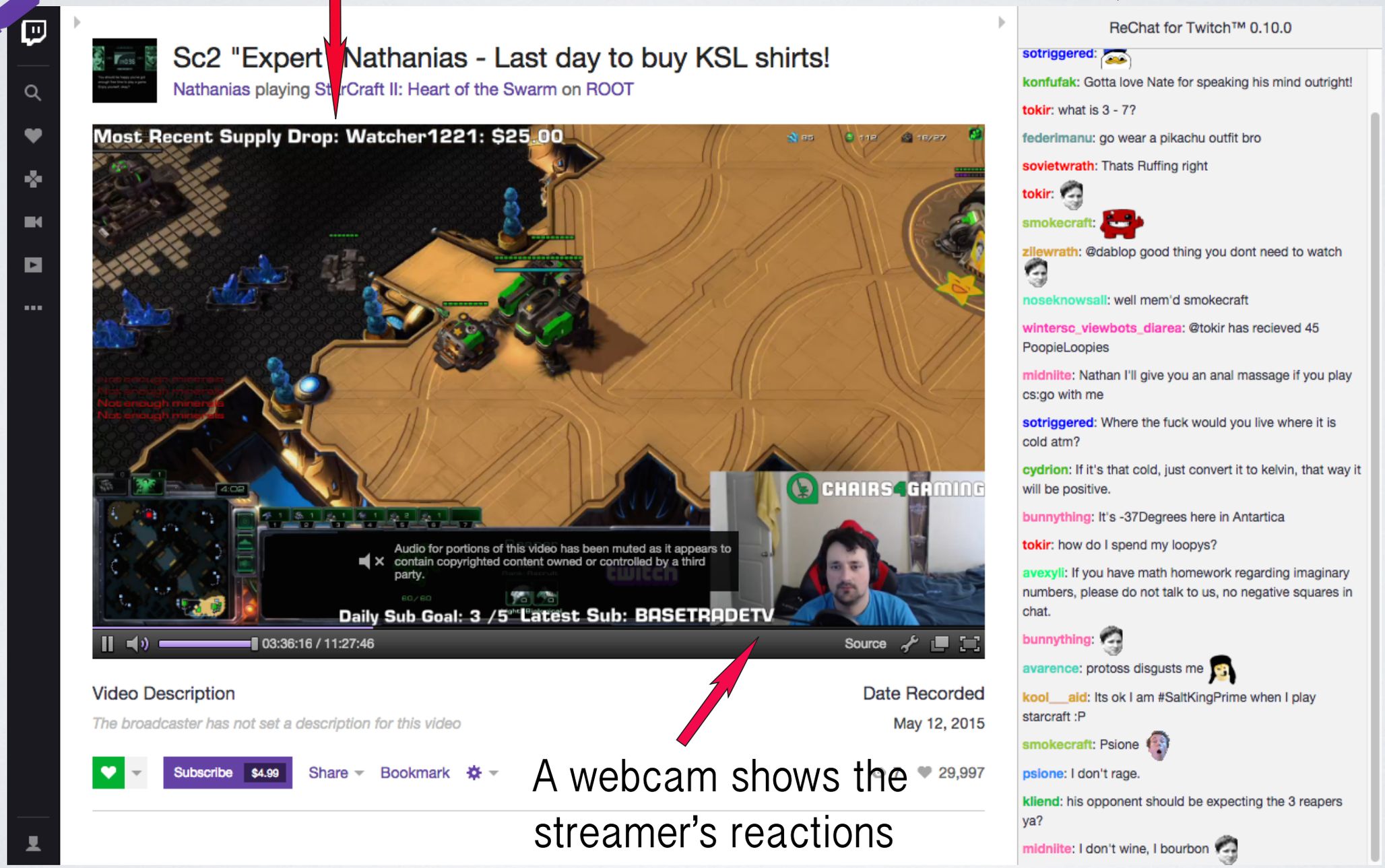


Online Game Streaming

Gameplay streamed live for the viewers

Viewers interact via chat



A webcam shows the streamer's reactions as he plays

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Gameplay streamed live for the viewers

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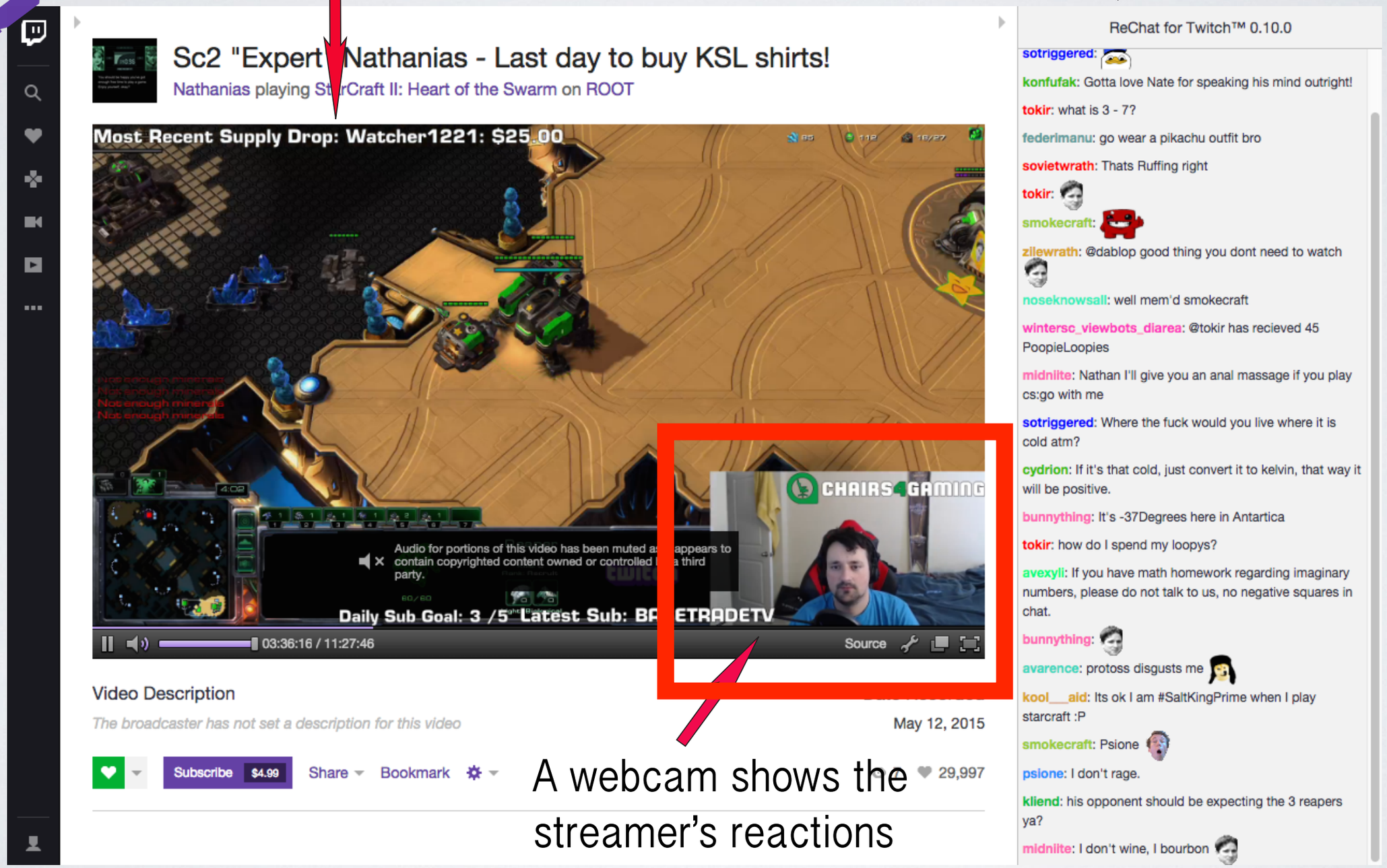

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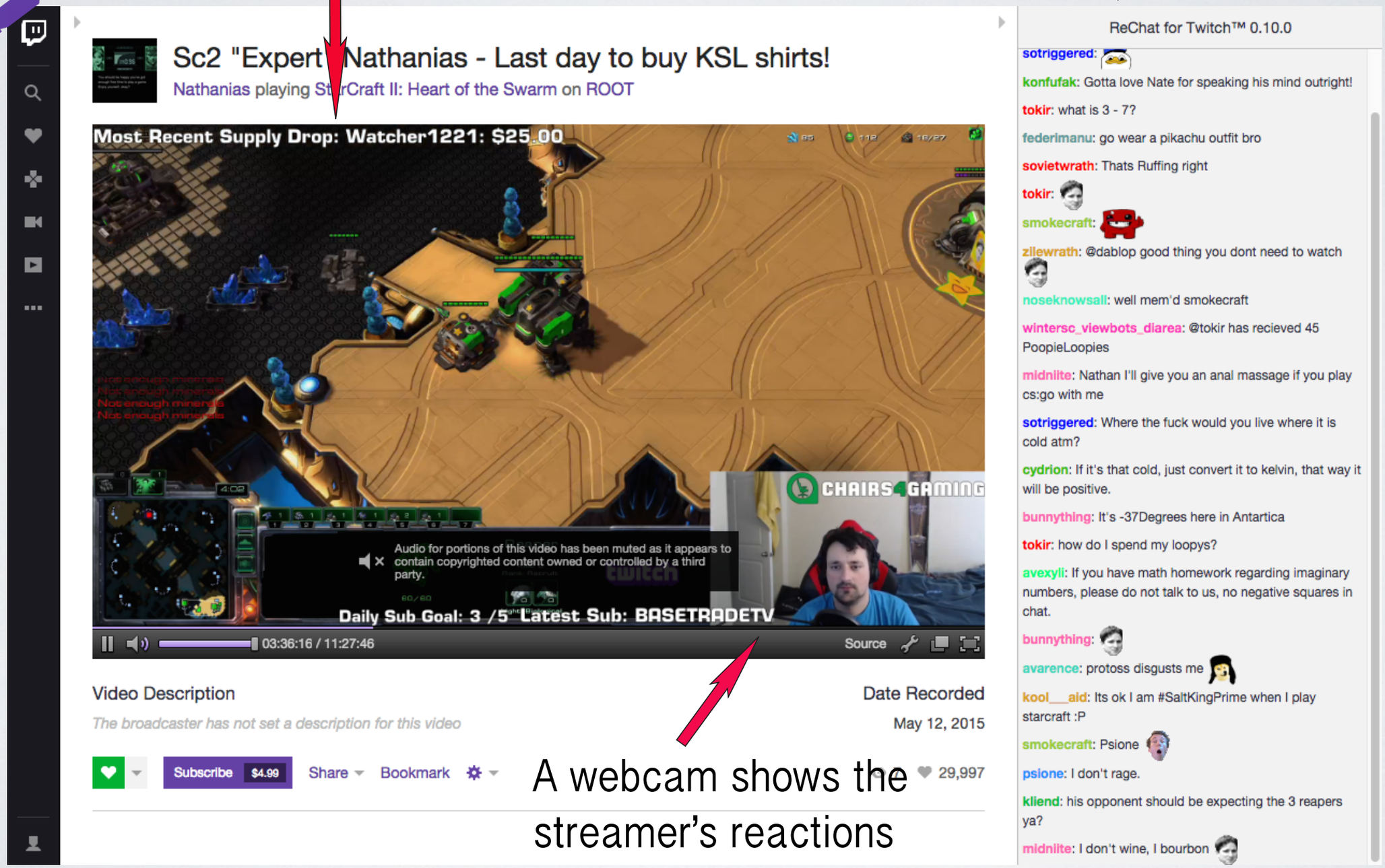

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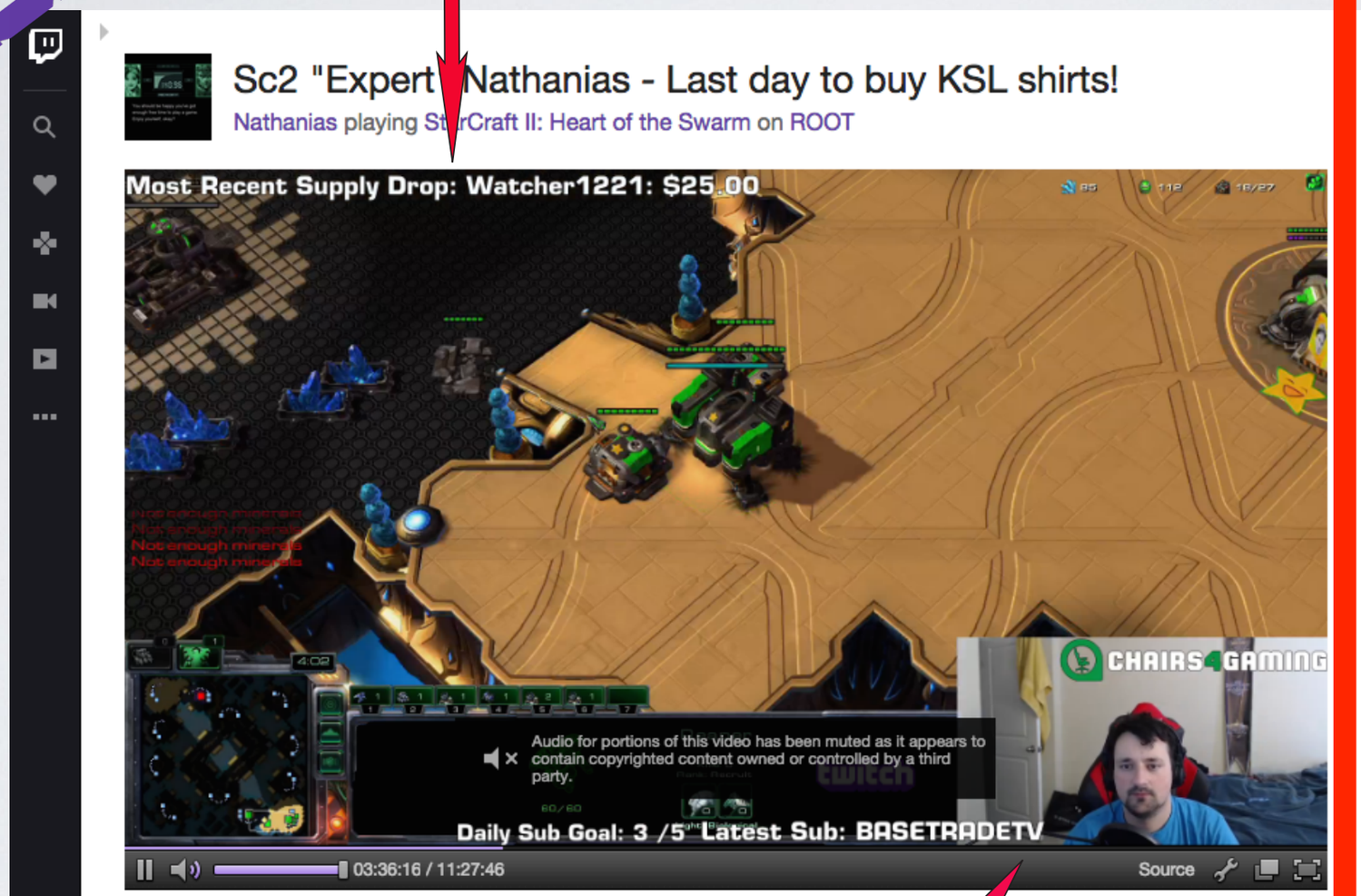

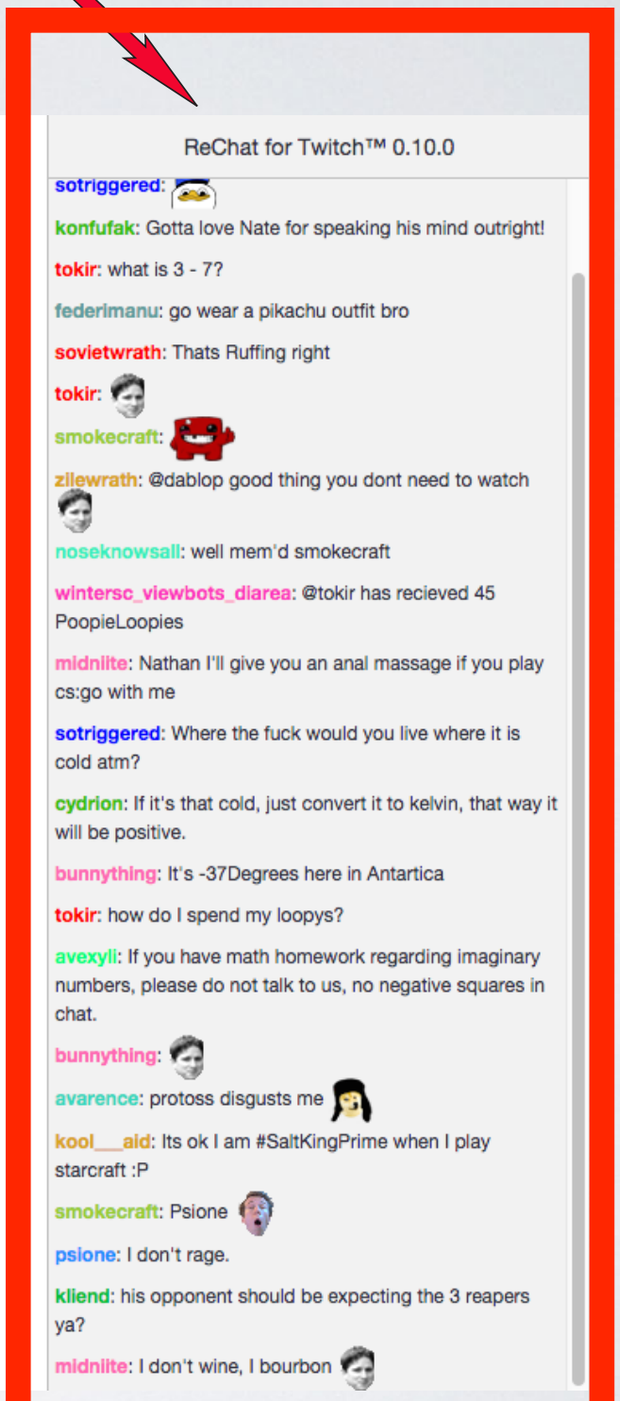

A webcam shows the streamer's reactions as he plays

Incentive for Twitch Streamers

Streamer

$$$

Subscriptions

Donations

Advertisement views

Selling merchandise

Viewers

Definition: Gender Differences

Differences based on the concept of gender, which refers to socially defined differences between men and women. By contrast, sexual differences can only be attributed solely to biological differences between males and females.

Objectification: Martha Nussbaum

- **Instrumentality** - treating the person as a tool for another's purpose
- **Denial of autonomy** - treating the person as lacking in autonomy or self-determinism
- **Inertness** - treating the person as lacking in agency or activity
- **Fungibility** - treating the person as interchangeable with other objects
- **Violability** - treating the person as lacking in boundary integrity and violable, "as something that is permissible to break up, smash, break into."
- **Ownership** - treating the person as though they can be owned, bought, or sold
- **Denial of subjectivity** - treating the person as though there is no need for concern for their experience or feelings

+ Rae Helen Langton

- **Reduction to body** - the treatment of a person as identified with their body, or body parts
- **Reduction to appearance** - the treatment of a person primarily in terms of how they look, or how they appear to the senses.
- **Silencing** - the treatment of a person as if they are silent, lacking the capacity to speak.

Research Question 1

BetterTTV v6.7 Loaded.

Welcome to Yogscast's chat room!

5:02 Pirea: Ahh nice

5:02 YogsZach: thanks for continueing to be a sub!

5:02 Yogscast: farts

5:02 Pirea: The channel was online in the afternoon ? Was it about the same thing ?

5:02 Yogscast: im gay

5:02 Lolsocks: hey tip of the hats is going on

This room is in subscribers only mode. To talk, purchase a channel subscription at http://www.twitch.tv/yogscast/subscribe?ref=subscriber_only_mode_chat

?

=

BetterTTV v6.7 Loaded.

Welcome to Yogscast's chat room!

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Research Question 2

?

BetterTTV v6.7 Loaded.
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This room is in subscribers only mode. To talk, purchase a channel subscription at http://www.twitch.tv/yogscast/subscribe?ref=subscriber_only_mode_chat

Perceived Gender

Female Streamers

Male Streamers

Perceived Gender

Female Streamers

Male Streamers

Popular

Less Popular

Perceived Gender

	Female Streamers	Male Streamers
Popular	100	100
Less Popular	100	100

Chat logs from streamer channels

What are the Statistically Overrepresented Words?

What are the Statistically Overrepresented Words?

Log Odds with Informative Dirichlet Prior Method
by Monroe et. al (2008)

Log-Odds with Informative Dirichlet Prior

$$\delta_w^{F-M} = \log\left(\left(y_w^F + \alpha_w\right) / \left(n_F + \alpha_0 - y_w^F + \alpha_w\right)\right) - \log\left(\left(y_w^M + \alpha_w\right) / \left(n_M + \alpha_0 - y_w^M + \alpha_w\right)\right)$$

y_w^F - Word w count in Female Corpus

α_w - Word w count in back-ground Corpus

n_F - Total word count in Female Corpus

α_0 - Total word count in back-ground Corpus

Log-Odds with Informative Dirichlet Prior

$$\sigma^2(\delta_w^{F\text{-}M}) \simeq 1/(y_w^F + \alpha_w) + 1/(y_w^M + \alpha_w)$$

$$Z = \delta_w^{F\text{-}M} / \sigma$$

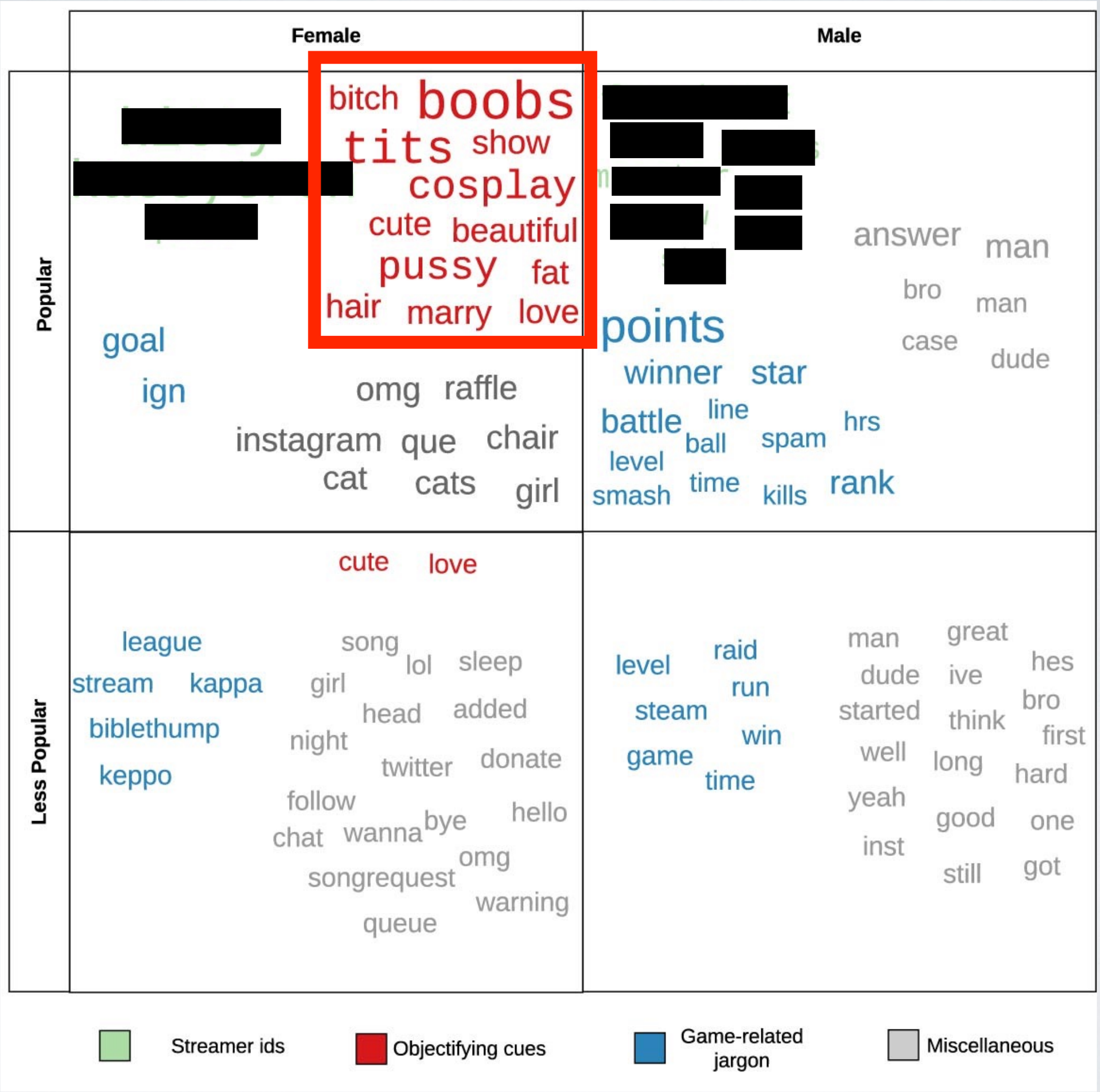
	Female	Male
Popular	bitch boobs tits show cosplay cute beautiful pussy fat hair marry love goal ign omg raffle instagram que chair cat cats girl	points winner star battle line ball spam hrs level smash time kills rank answer man bro man case dude
Less Popular	cute love league song lol sleep stream kappa girl head added biblethump night twitter donate keppo follow chat wanna bye hello songrequest omg queue warning	level raid run steam win game time man great dude ive hes started think bro well long first yeah hard good one inst still got

Streamer ids

Objectifying cues

Game-related jargon

Miscellaneous


Female
Male
Popular
Less Popular
bitch
boobs
tits
show
cosplay
cute
beautiful
pussy
fat
hair
marry
love
goal
ign
omg
raffle
instagram
que
chair
cat
cats
girl
points
winner
star
battle
line
ball
spam
hrs
level
smash
time
kills
rank
answer
man
bro
man
case
dude
cute
love
league
stream
kappa
biblethump
keppo
song
lol
sleep
girl
head
added
night
twitter
donate
follow
chat
wanna
bye
hello
songrequest
omg
warning
queue
level
raid
run
steam
win
game
time
man
great
dude
ive
hes
started
think
bro
well
long
first
hard
yeah
good
one
inst
still
got
Streamer ids
Objectifying cues
Game-related jargon
Miscellaneous

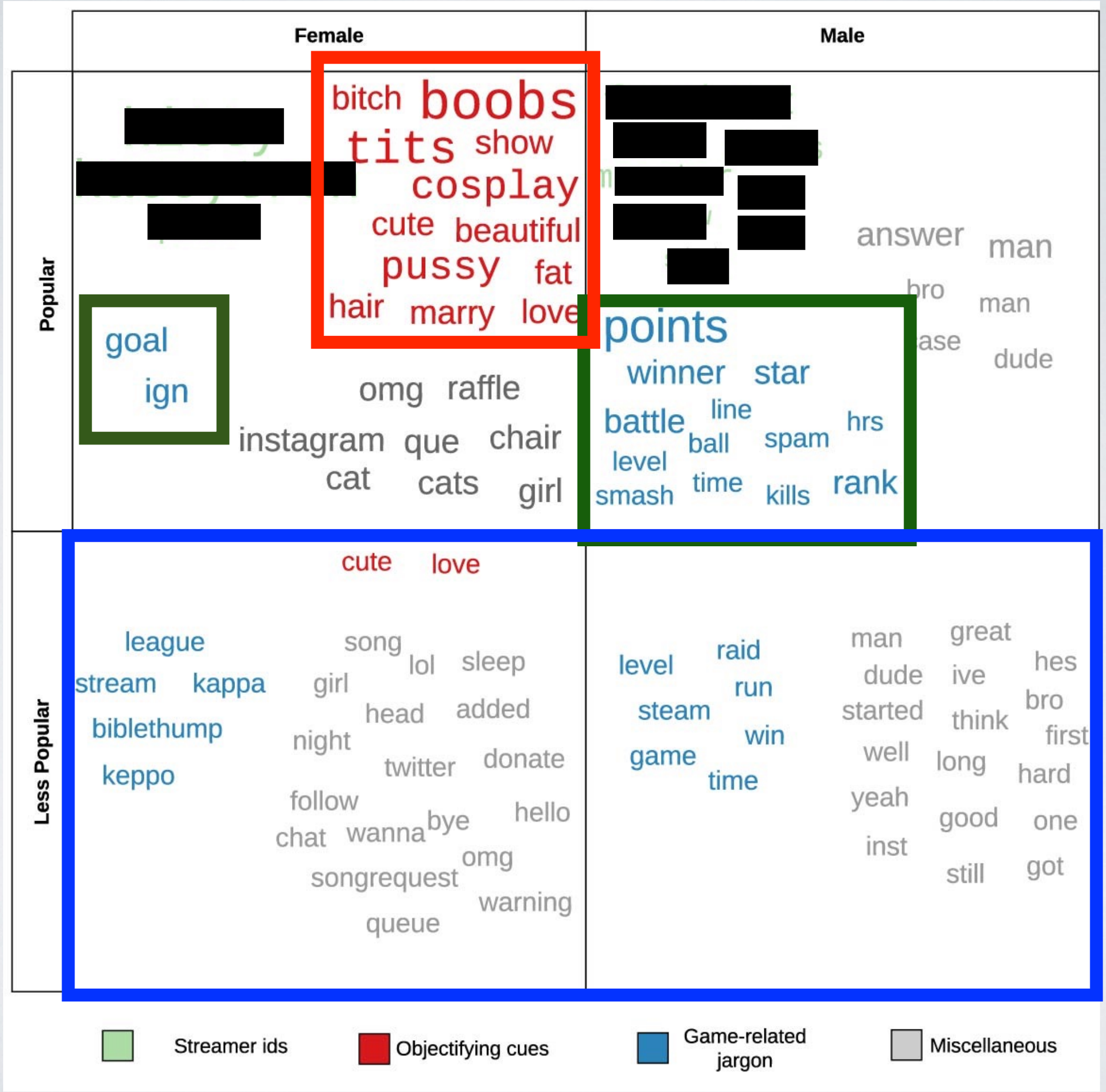
	Female	Male
Popular	[redacted] bitch boobs tits show cosplay cute beautiful pussy fat hair marry love goal ign omg raffle instagram que chair cat cats girl	[redacted] answer man bro man ase dude points winner star battle line ball spam hrs level smash time kills rank
Less Popular	cute love league stream kappa biblethump keppo song lol sleep girl head added night twitter donate follow chat wanna bye hello songrequest omg warning queue	level raid run steam win game time man great dude ive hes started think bro well long first yeah hard good one inst still got

Streamer ids

Objectifying cues

Game-related jargon

Miscellaneous


Female
Male
Popular
Less Popular
bitch
boobs
tits
show
cosplay
cute
beautiful
pussy
fat
hair
marry
love
goal
ign
omg
raffle
instagram
que
chair
cat
cats
girl
points
winner
star
battle
line
ball
spam
hrs
level
smash
time
kills
rank
answer
man
bro
man
ase
dude
cute
love
league
stream
kappa
biblethump
keppo
song
lol
sleep
girl
head
added
night
twitter
donate
follow
hello
chat
wanna
bye
omg
songrequest
warning
queue
level
raid
run
steam
win
game
time
man
great
dude
ive
hes
started
think
bro
well
long
first
hard
yeah
good
one
inst
still
got
Streamer ids
Objectifying cues
Game-related jargon
Miscellaneous

	Female	Male
Popular	your_boobs you_are your_tits love_you is_her your_hair she_has does_she you_look so_cute she_doesnt so_beautiful did_she marry_me fap_fap is_she so_pretty when_she this_girl we_all she_is dont_forget right_in is_to she_will	pogchamp_pogchamp he_is is_he this_game he_was on_ps he_got did_he of_his hey_man when_he he_can you_think he_doesnt does_he is_your he_has whats_up welcome_to is_up are_on is_the of_the here_is link_to
Less Popular	to_play she_is you_can you_want are_you if_you you_are do_it it_is of_the do_you will_be you_should added_to been_added how_do you_get this_is you_know to_go it_was is_the the_song want_to for_the what_is you_guys has_been to_the to_get in_the did_not im_not dont_know to_do with_the on_the that_was the_stream go_to on_my at_the would_be	the_game he_is the_queue is_so

Objectifying cues

Game-related jargon

Miscellaneous

	Female	Male
Popular	your_boobs your_tits love_you your_hair you_look so_cute so_beautiful marry_me fap_fap so_pretty you_are is_her she_has does_she she_doesnt did_she is_she when_she this_girl we_all dont_forget she_is right_in is_to she_will	pogchamp_pogchamp this_game on_ps he_is is_he he_was he_got did_he of_his hey_man when_he he_can you_think he_doesnt does_he is_your he_has whats_up welcome_to is_up are_on is_the of_the here_is link_to
Less Popular	to_play she_is you_can are_you the_queue is_so you_should added_to been_added you_know this_is to_go the_song want_to you_guys has_been to_the im_not dont_know the_stream go_to on_my	the_game he_is you_want you_are if_you do_it it_is of_the do_you will_be how_do you_get it_was is_the for_the what_is to_get in_the did_not to_do with_the on_the that_was at_the would_be

Objectifying cues

Game-related jargon

Miscellaneous

	Female	Male
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Less Popular	to_play she_is you_can you_want are_you if_you you_are do_it it_is of_the do_you will_be you_should added_to been_added how_do you_get this_is you_know to_go it_was is_the the_song want_to for_the what_is you_guys has_been to_the to_get in_the did_not im_not dont_know to_do with_the on_the that_was the_stream go_to on_my at_the would_be	the_game he_is the_queue is_so

Objectifying cues

Game-related jargon

Miscellaneous

	Female	Male
Popular	your_boobs you_are your_tits love_you is_her your_hair she_has you_look does_she so_cute she_doesnt so_beautiful did_she marry_me fap_fap is_she so_pretty when_she this_girl she_is we_all dont_forget right_in is_to she_will	pogchamp_pogchamp he_is is_he this_game on_ps he_was he_got did_he of_his hey_man when_he he_can you_think he_doesnt does_he is_your he_has whats_up welcome_to is_up are_on is_the of_the here_is link_to
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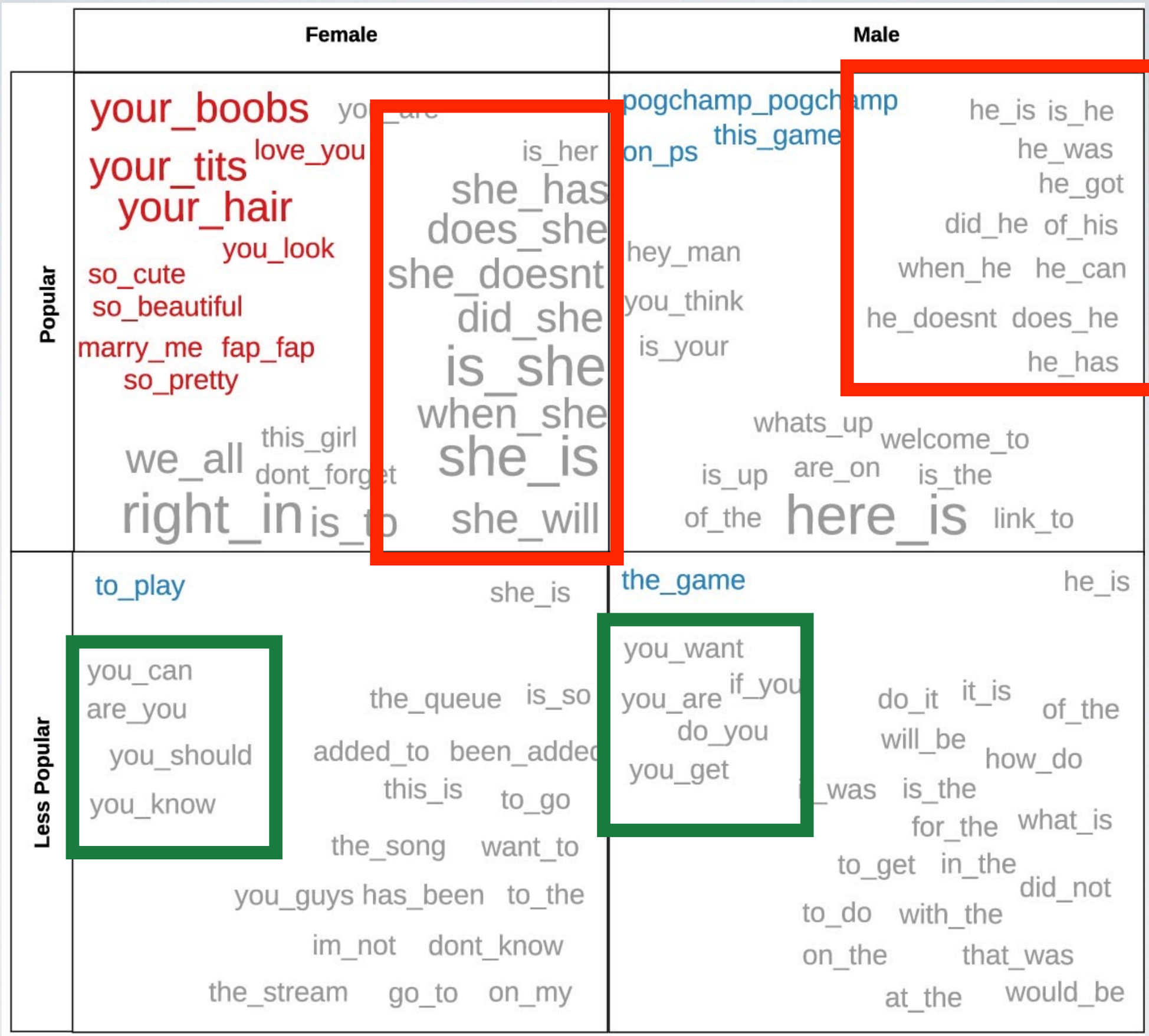
Objectifying cues

Game-related jargon

Miscellaneous


Female
Male
Popular
Less Popular
your_boobs
your_tits
love_you
your_hair
you_look
so_cute
so_beautiful
marry_me
fap_fap
so_pretty
we_all
this_girl
dont_forget
right_in
is_her
she_has
does_she
she_doesnt
did_she
is_she
when_she
she_is
she_will
pogchamp_pogchamp
this_game
on_ps
hey_man
you_think
is_your
he_is
is_he
he_was
he_got
did_he
of_his
when_he
he_can
he_doesnt
does_he
he_has
whats_up
welcome_to
is_up
are_on
is_the
of_the
here_is
link_to
to_play
she_is
you_can
are_you
you_should
you_know
the_queue
is_so
added_to
been_added
this_is
to_go
the_song
want_to
you_guys
has_been
to_the
im_not
dont_know
the_stream
go_to
on_my
the_game
he_is
you_want
you_are
if_you
do_you
you_get
do_it
it_is
of_the
will_be
how_do
is_the
for_the
what_is
to_get
in_the
did_not
to_do
with_the
on_the
that_was
at_the
would_be
Objectifying cues
Game-related jargon
Miscellaneous

Male

Popular

your_boobs
your_tits
your_hair
love_you
you_look
so_beautiful
marry_me
fap_fap
so_pretty
we_all
this_girl
dont_forget
right_in
is_her
she_has
does_she
she_doesnt
did_she
is_she
when_she
she_is
she_will
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on_ps
hey_man
you_think
is_your
he_is
is_he
he_was
he_got
did_he
of_his
when_he
he_can
he_doesnt
does_he
he_has
whats_up
welcome_to
is_up
are_on
is_the
of_the
here_is
link_to

Less Popular

to_play
she_is
you_can
are_you
you_should
you_know
the_queue
is_so
added_to
been_added
this_is
to_go
the_song
want_to
you_guys
has_been
to_the
im_not
dont_know
the_stream
go_to
on_my
the_game
he_is
you_want
you_are
if_you
do_you
you_get
do_it
it_is
of_the
will_be
how_do
is_the
for_the
what_is
to_get
in_the
did_not
to_do
with_the
on_the
that_was
at_the
would_be

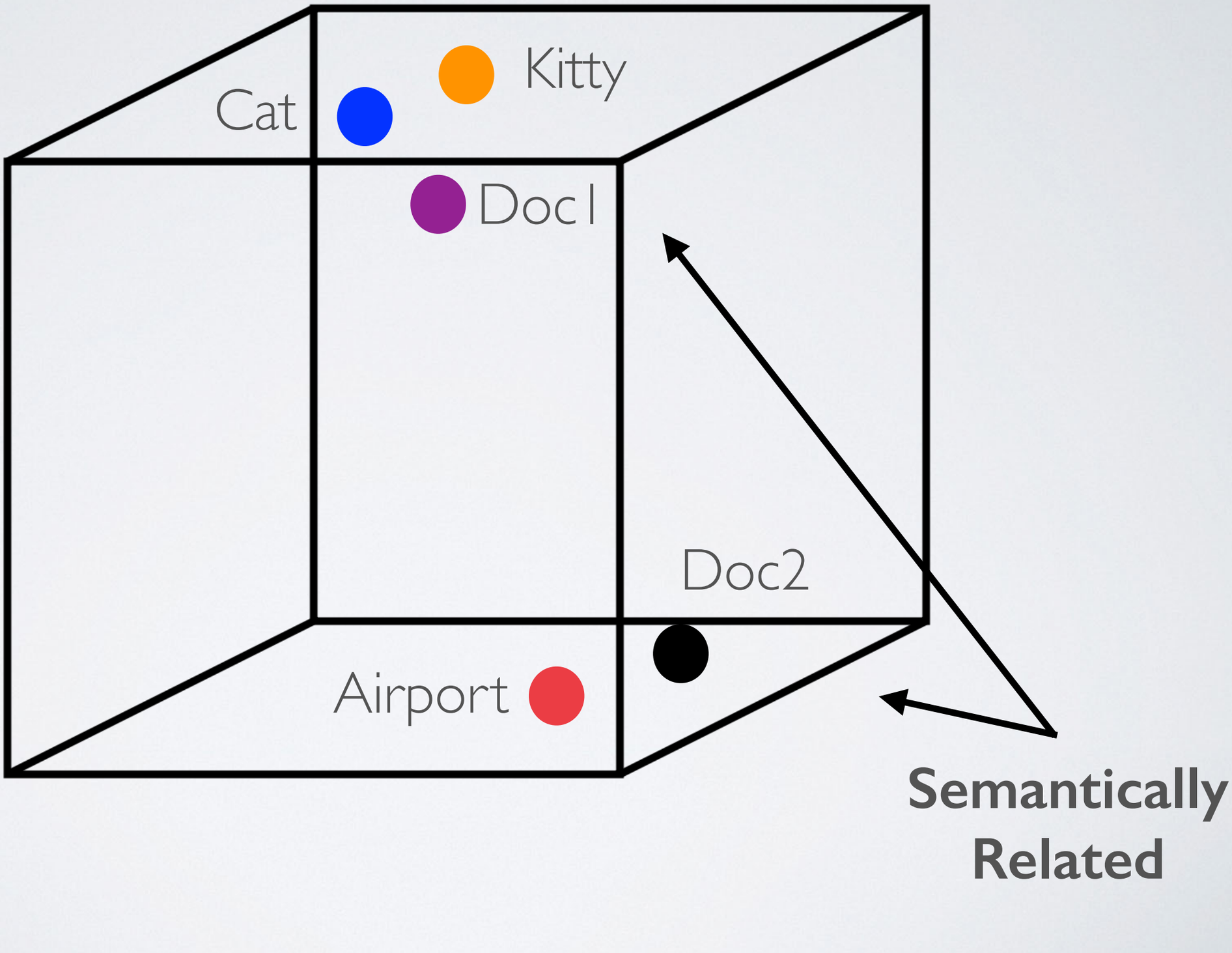
Objectifying cues

Game-related jargon

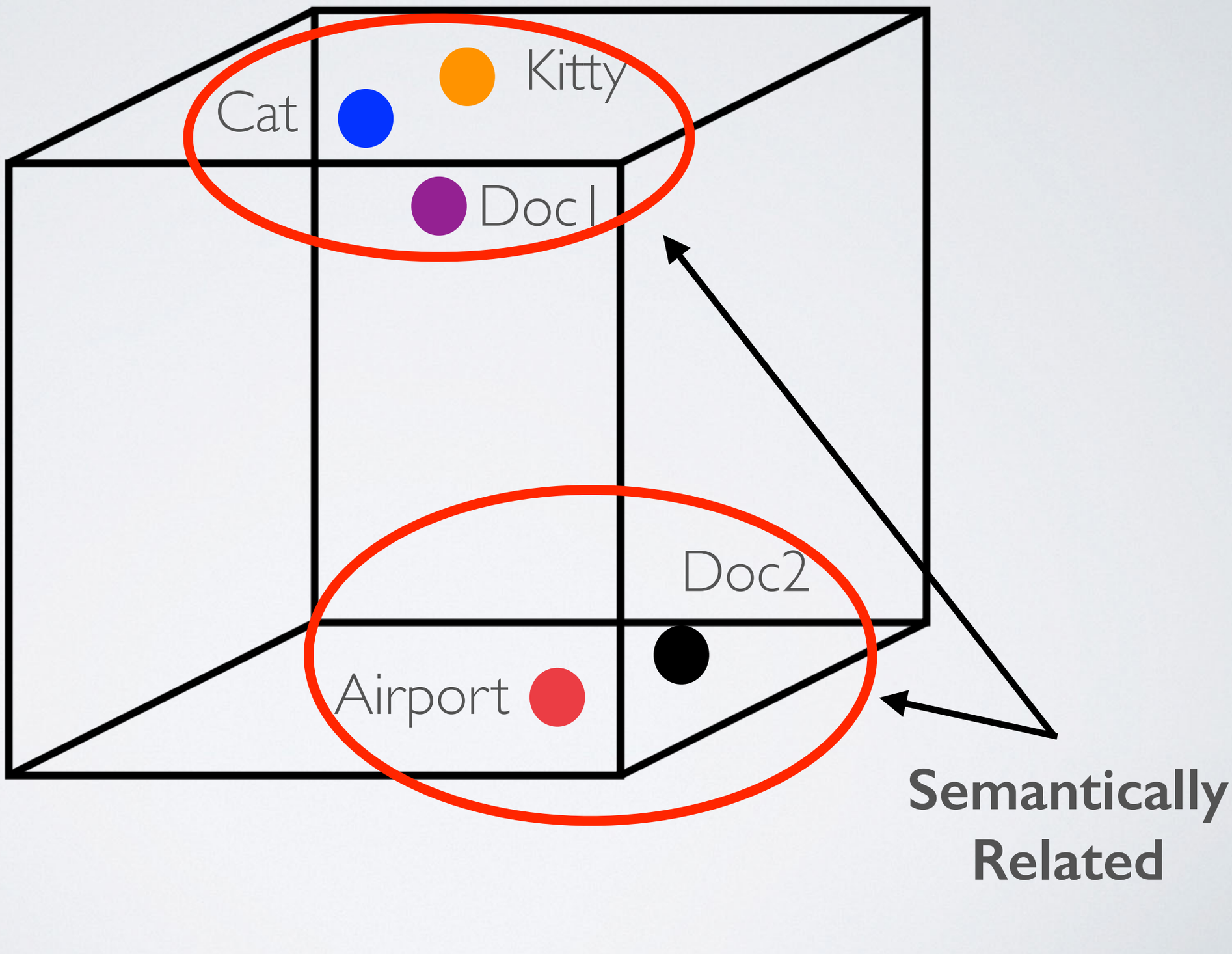
Miscellaneous

Can we predict the gender of the streamer from the messages?

Doc2Vec Embeddings



Doc2Vec Embeddings



Can we predict streamer's gender from chat content?

- Remove 'he,' 'she,' 'his,' 'her,' etc. from the chat logs

Can we predict streamer's gender from chat content?

- Remove 'he,' 'she,' 'his,' 'her,' etc. from the chat logs

Can we predict streamer's gender from chat content?

- Remove 'he,' 'she,' 'his,' 'her,' etc. from the chat logs

87% Accuracy

What are the learned features?

What are the learned features?

What are the learned features?

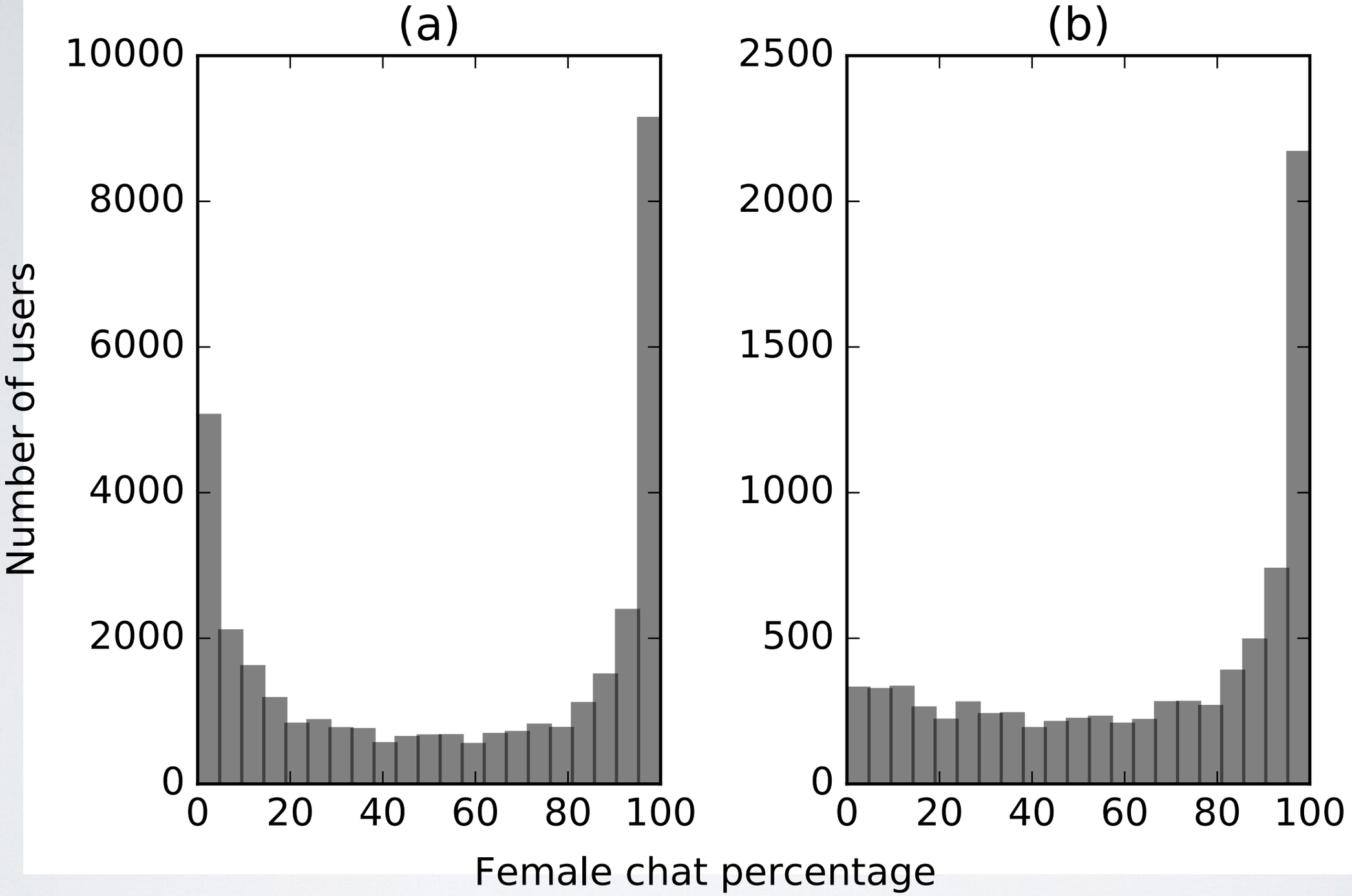
Predicted as Female: cute, beautiful, smile, babe, lovely, marry, boobs, gorgeous, omg, hot

Predicted as Male: epoch, attempts, consistent, reset, shields, fastest, devs, slower, melee, glitch

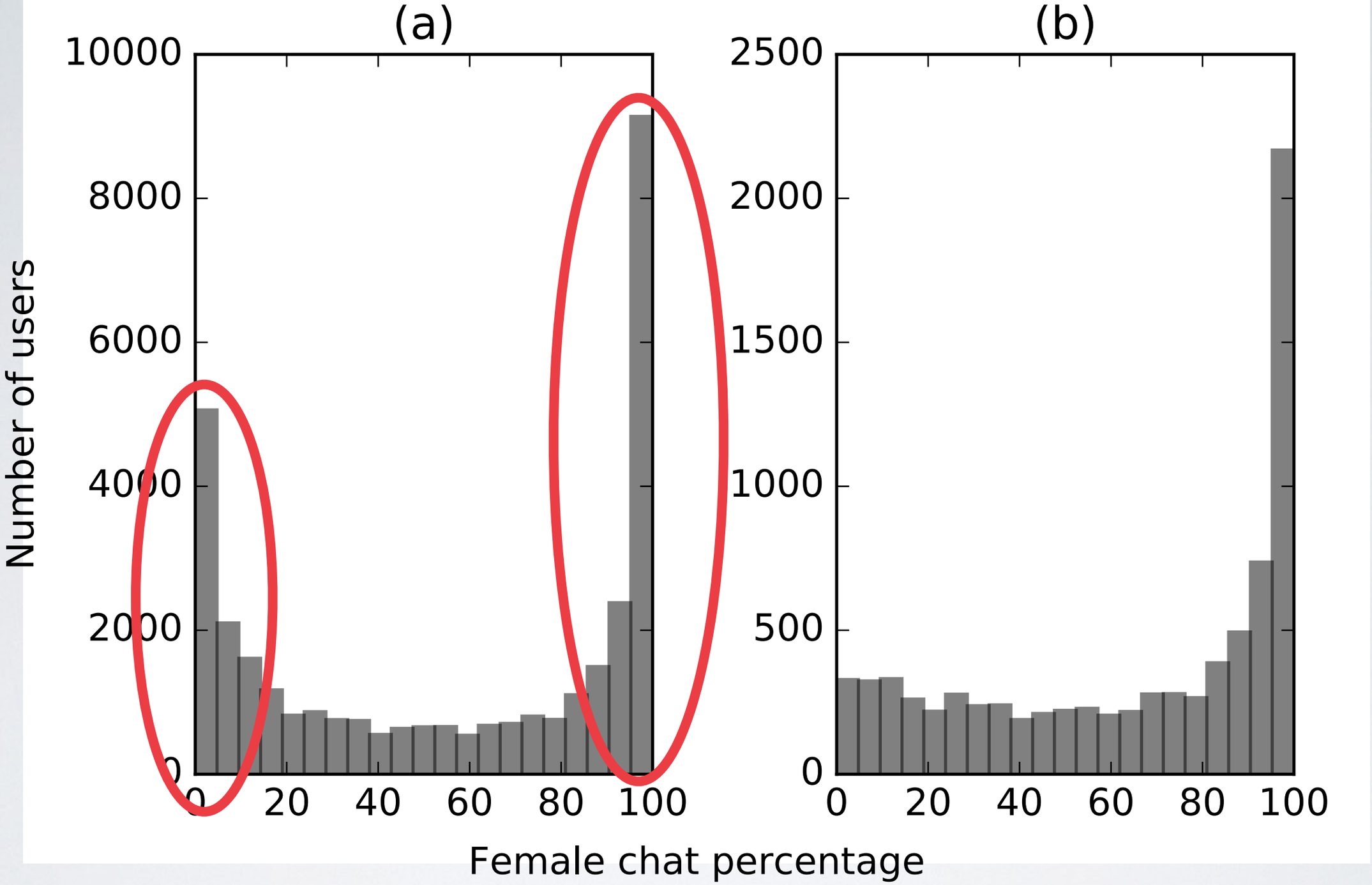
Is viewing and commenting behavior of viewer's gendered?

Viewing Preferences

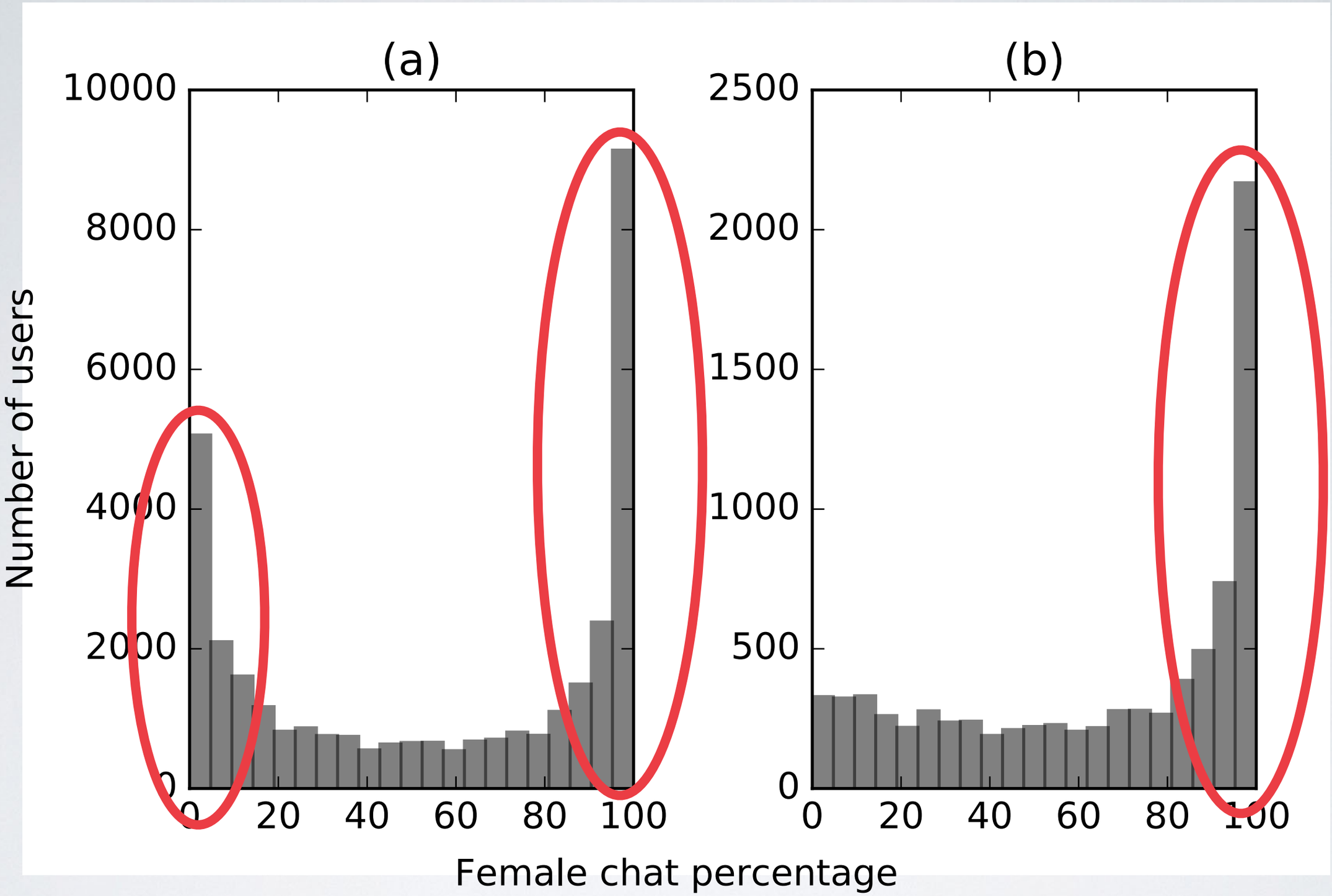
$$\text{Female channel chat ratio} = \frac{\#\_\text{chat\_messages\_in\_female\_channels}}{\#\_\text{total\_chat\_messages\_posted\_by\_viewer}}$$



(a) Viewers posted in at least 5 channels
(b) Viewers posted in at least 10 channels



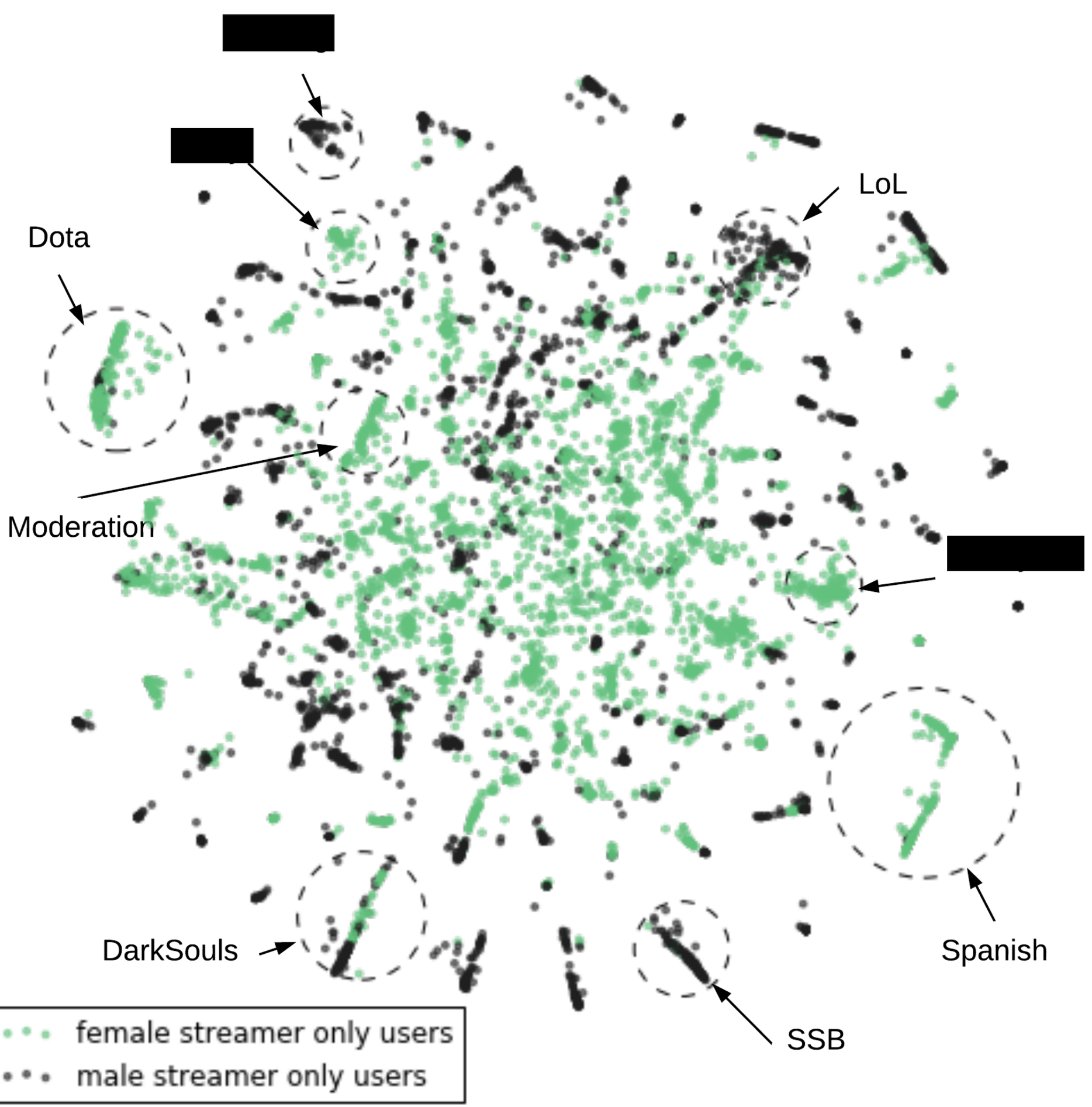
(a) Viewers posted in at least 5 channels
(b) Viewers posted in at least 10 channels

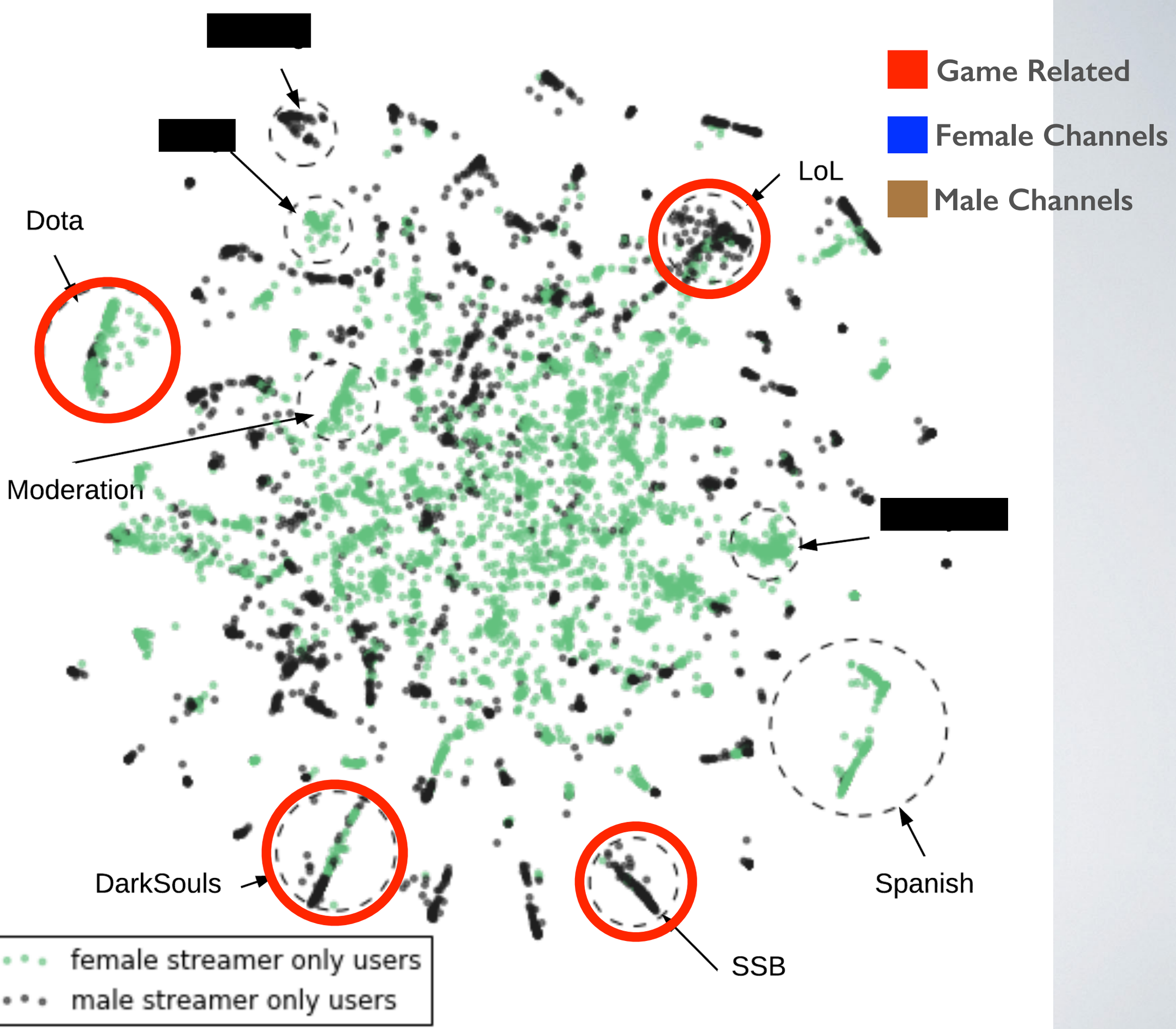


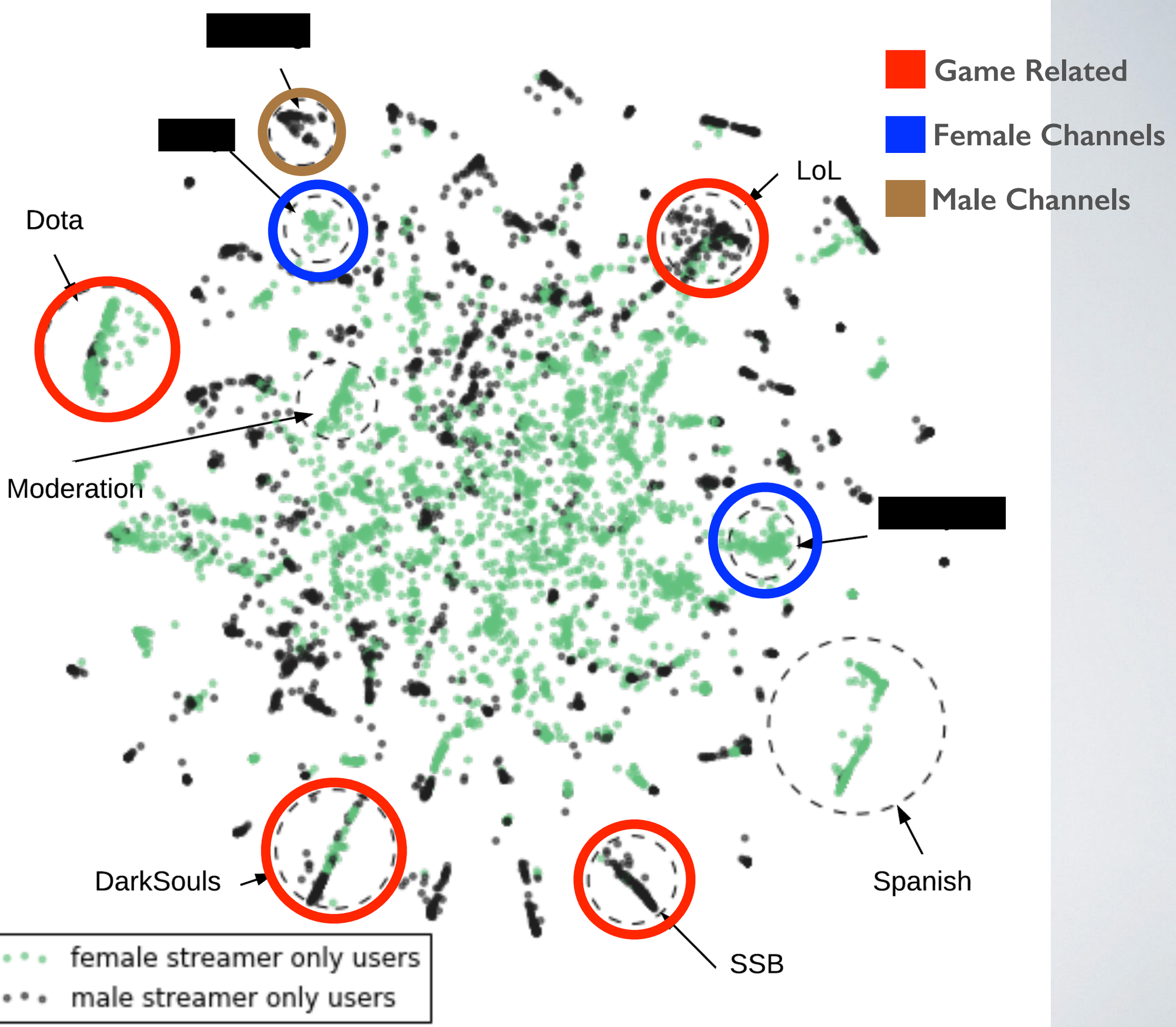
(a) Viewers posted in at least 5 channels
(b) Viewers posted in at least 10 channels

Document Embeddings for Viewers

- Aggregate all chat messages by each Viewer
- Doc2Vec to obtain document embeddings
- Focus on Viewers who posted only in female or male channels


[redacted]
[redacted]
Dota
LoL
Moderation
[redacted]
DarkSouls
Spanish
SSB
female streamer only users
male streamer only users


[redacted]
[redacted]
Dota
LoL
Moderation
[redacted]
Game Related
Female Channels
Male Channels
DarkSouls
SSB
Spanish
female streamer only users
male streamer only users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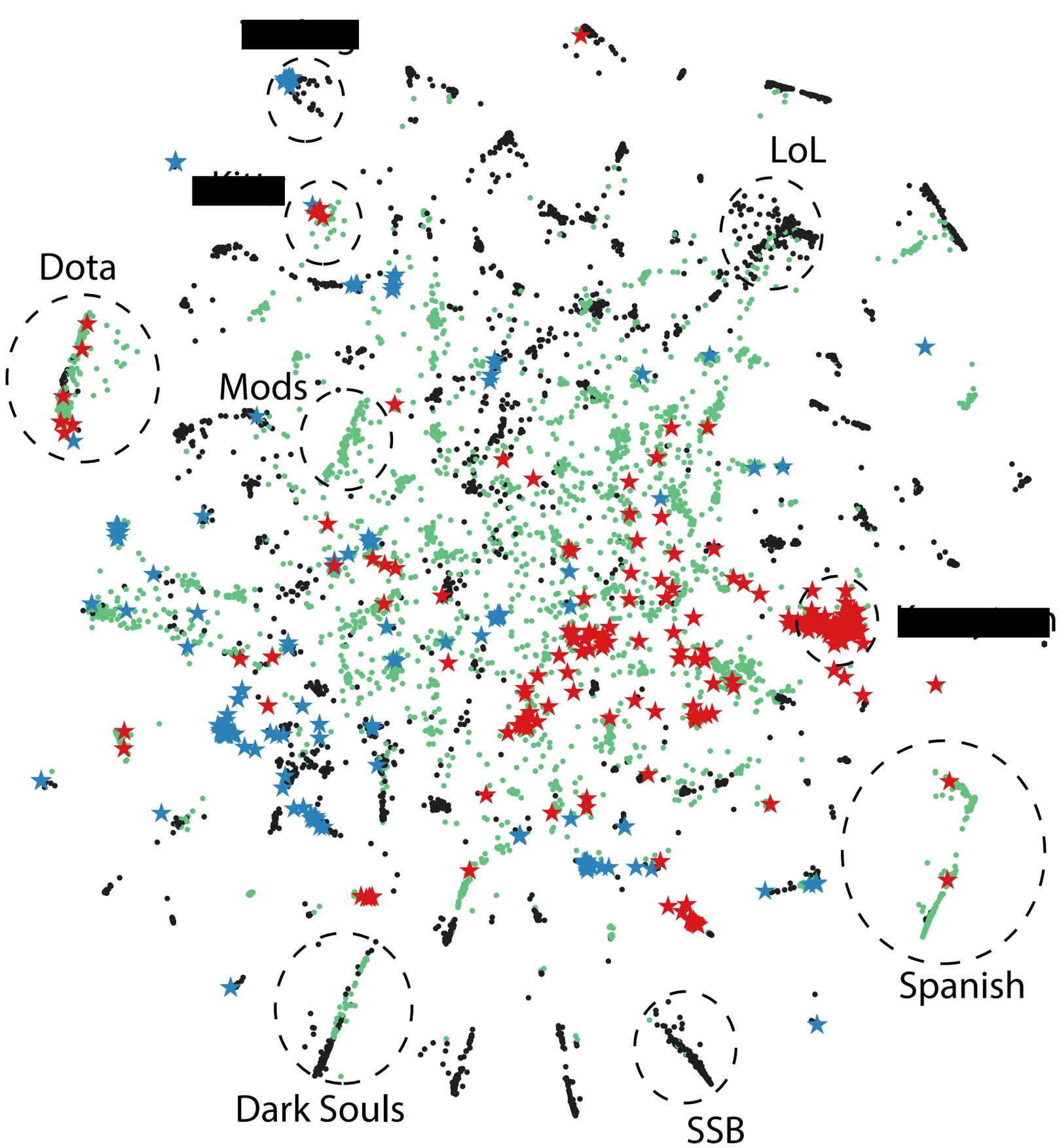
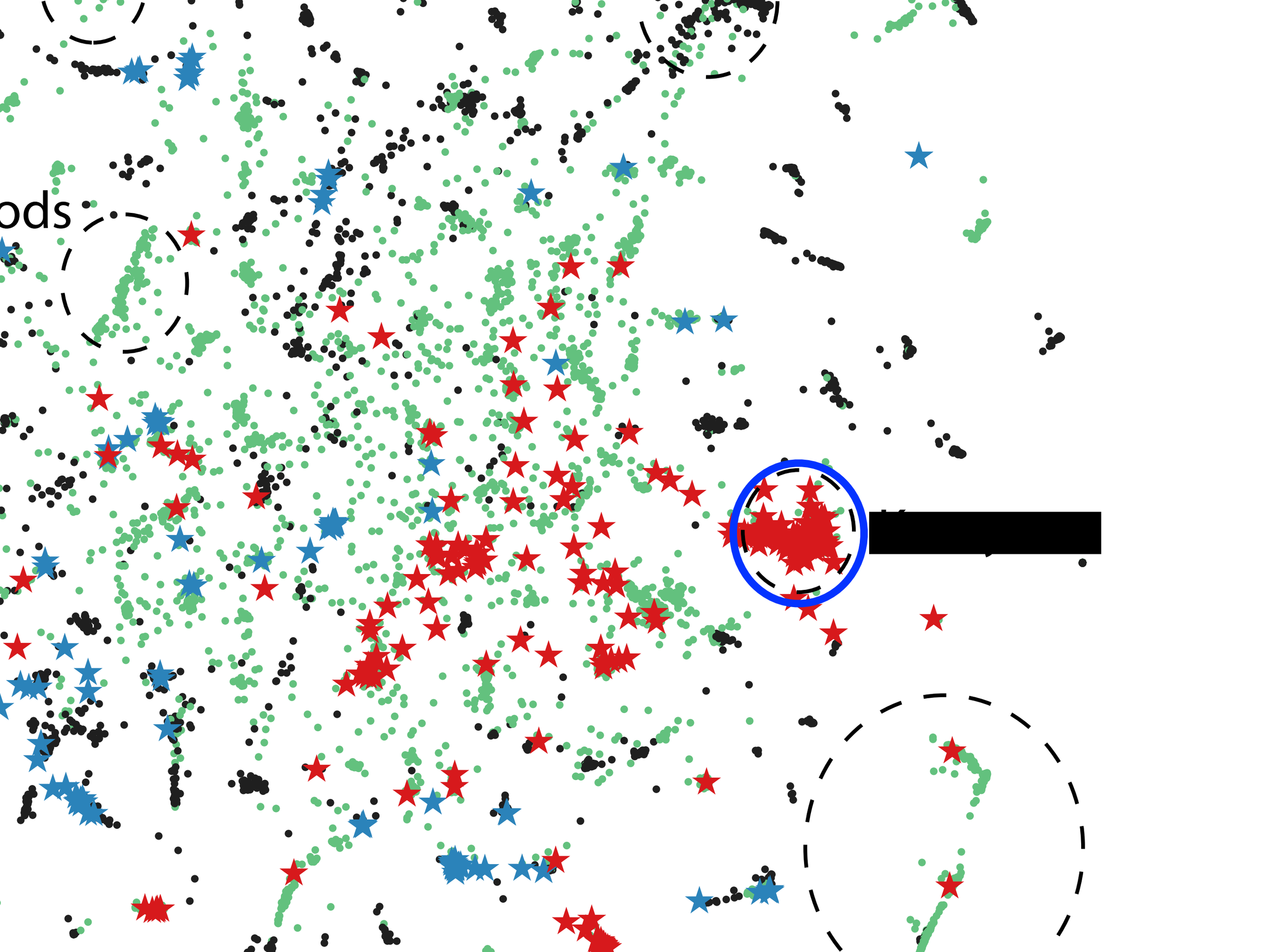
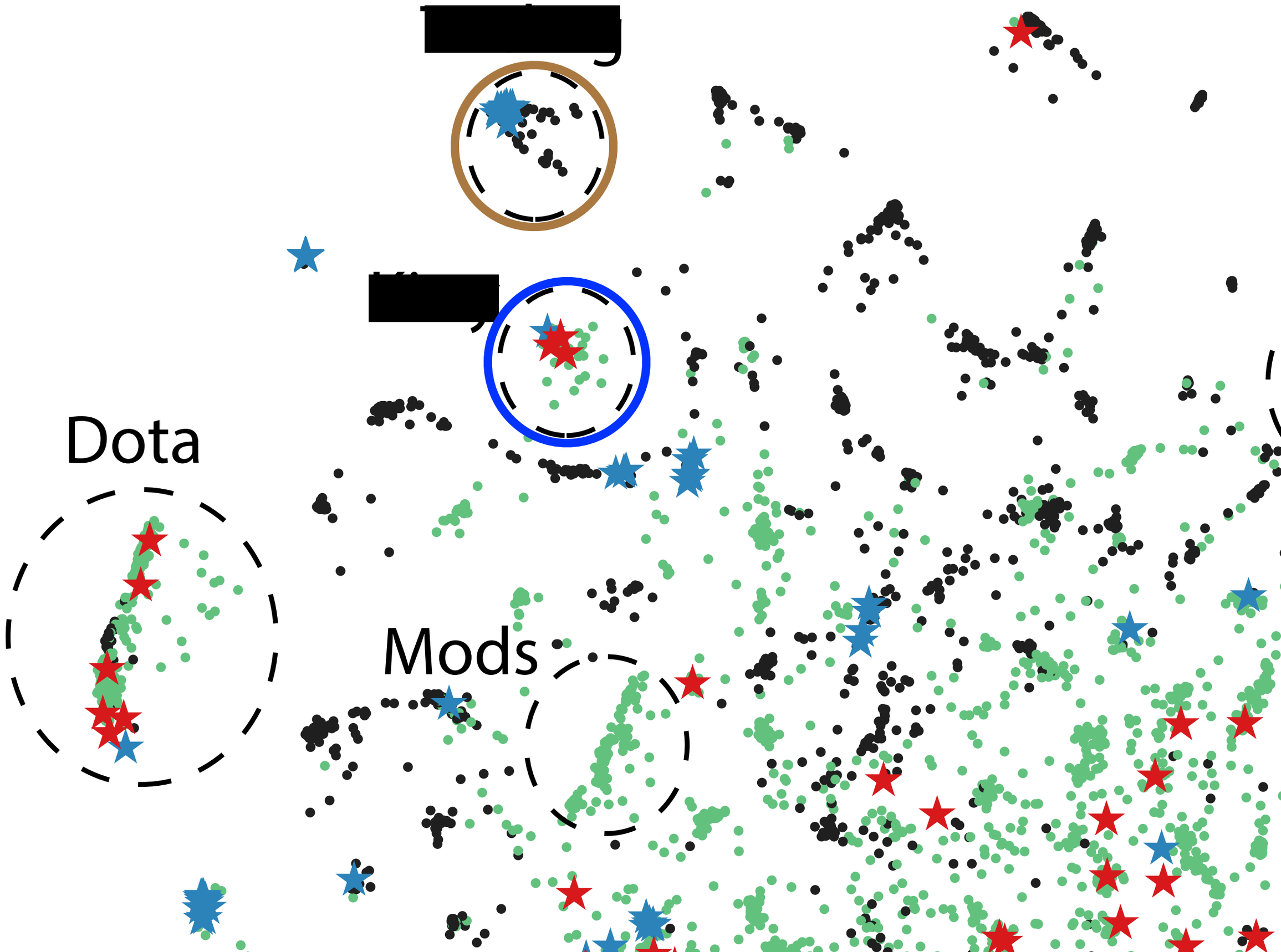
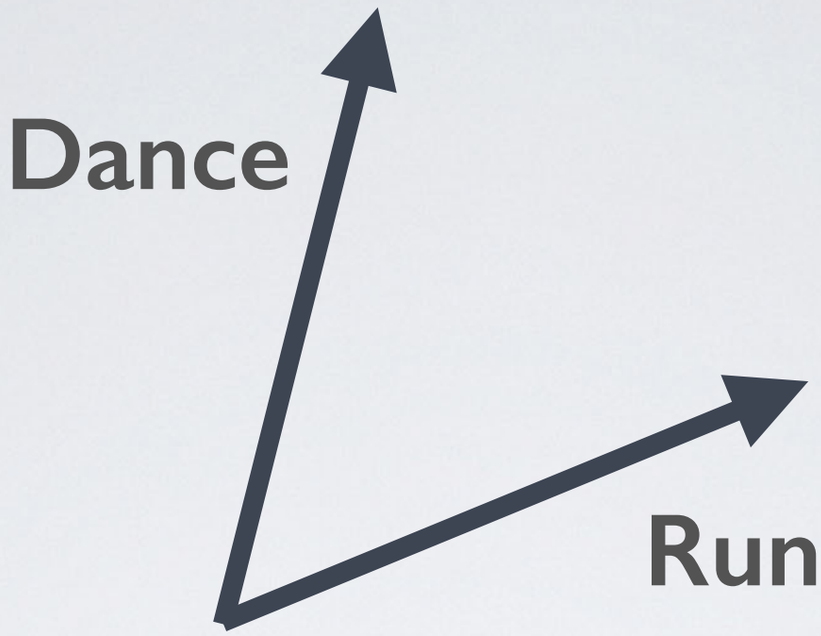


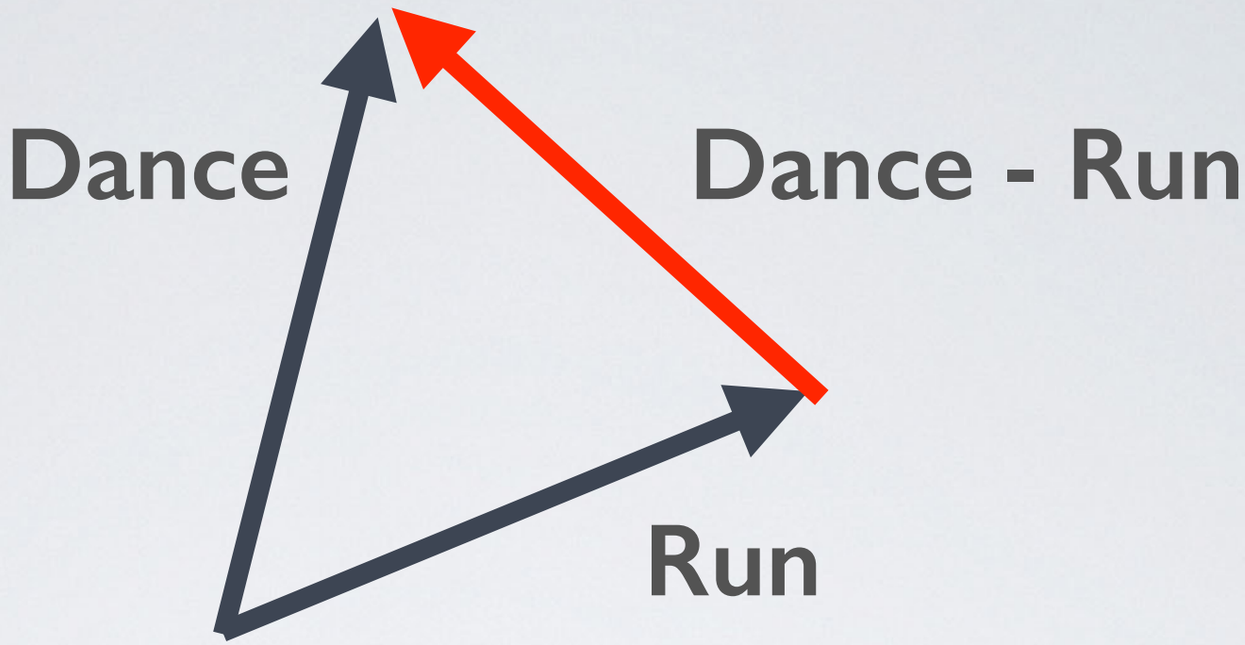
similar to word "points"

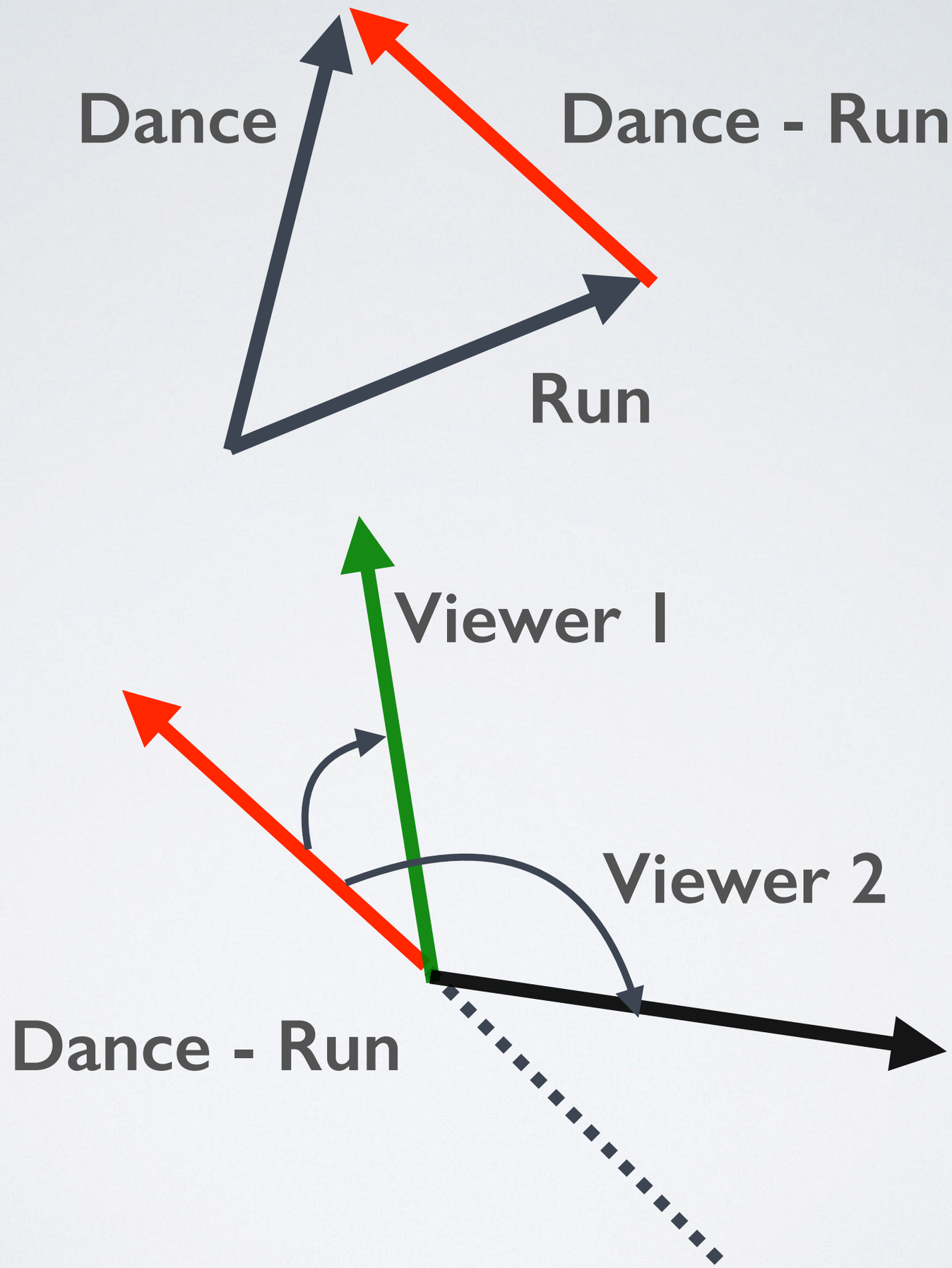
similar to word "boobs"

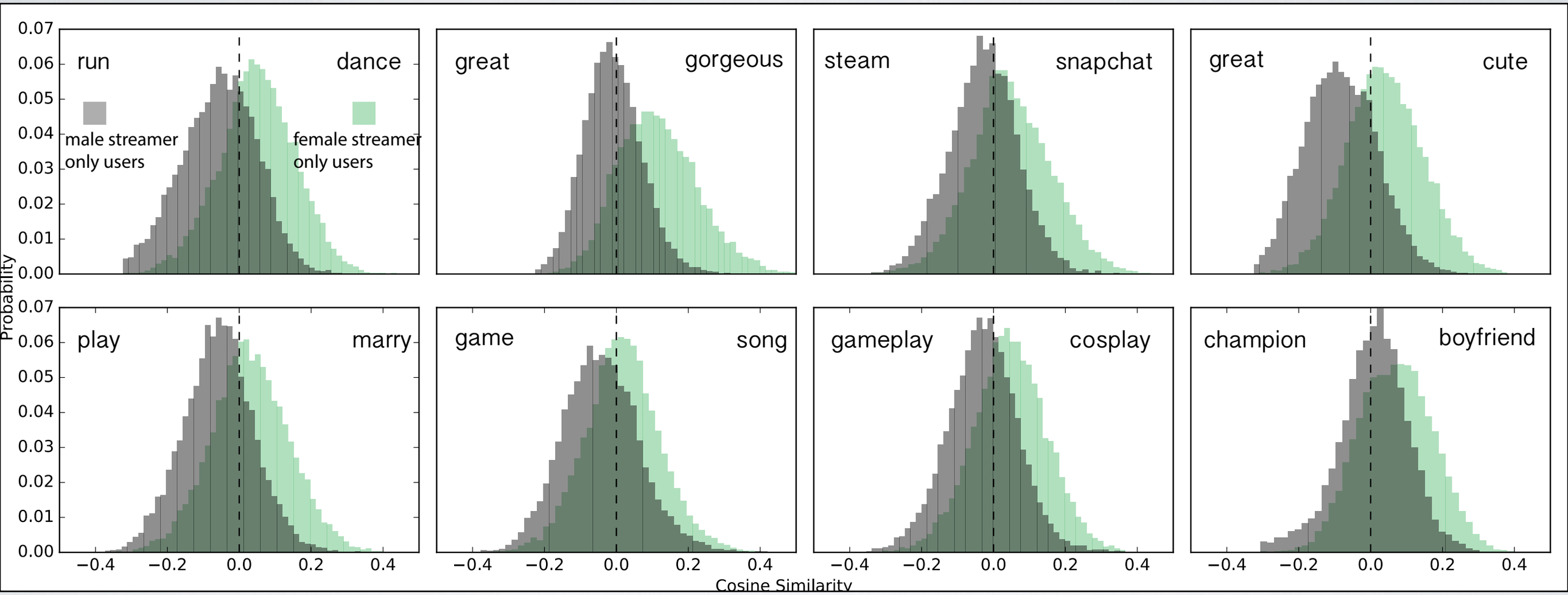

ods


Dota
Mods


Dance
Run


Dance
Dance - Run
Run


Dance
Dance - Run
Run
Viewer 1
Viewer 2
Dance - Run


run
dance
male streamer only users
female streamer only users
great
gorgeous
steam
snapchat
great
cute
play
marry
game
song
gameplay
cosplay
champion
boyfriend
Probability
Cosine Similarity
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
−0.4
−0.2
0.0
0.2
0.4

Can we predict Viewer's preference from chat

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- Train a logistic regression model

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88% Accuracy

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88% Accuracy

- Learned Features

Predicted as Female: gorgeous, beautiful, makeup, wig, cute, marry, dress, perv, pervert, smile

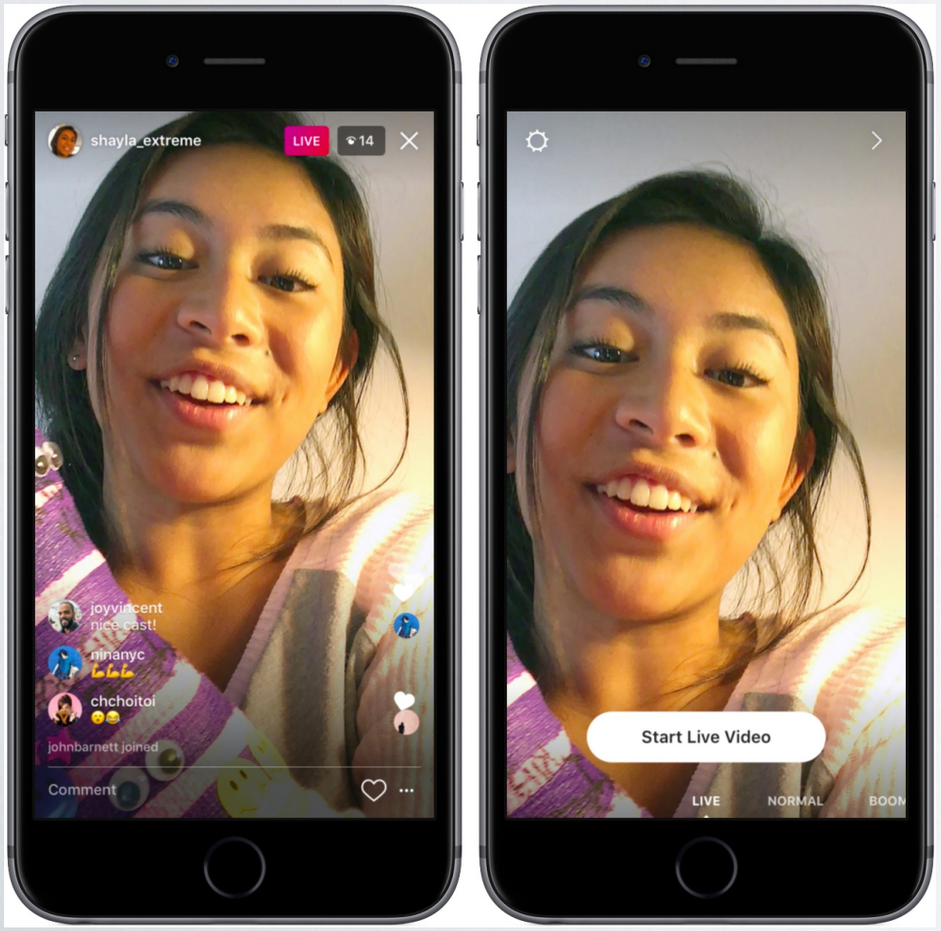
Predicted as Male: ridley (character), quad (accessories), melee, cirno(character), glitch, unlocked, leaderboards, mechanic, resets, rebirth

What are implications from the findings of our study?

NEW
LIVE

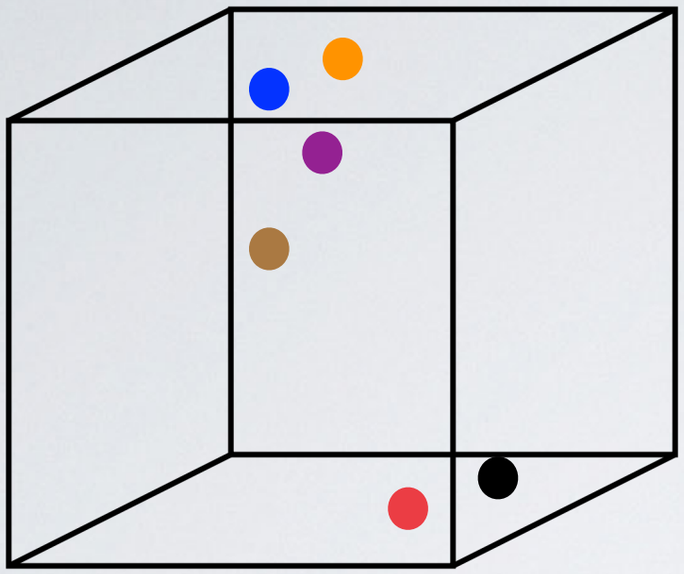
twitch

LIVE
134
Tory Hargo
Look at all of them. Amazing.
Sam Evans
These penguins are so cute! I just want to cuddle one.
Shirly Ip
You must be so cold!


shayla_extreme
LIVE
14
joyvincent
nice cast!
ninanyc
chchoitoi
johnbarnett joined
Comment
Start Live Video
LIVE
NORMAL

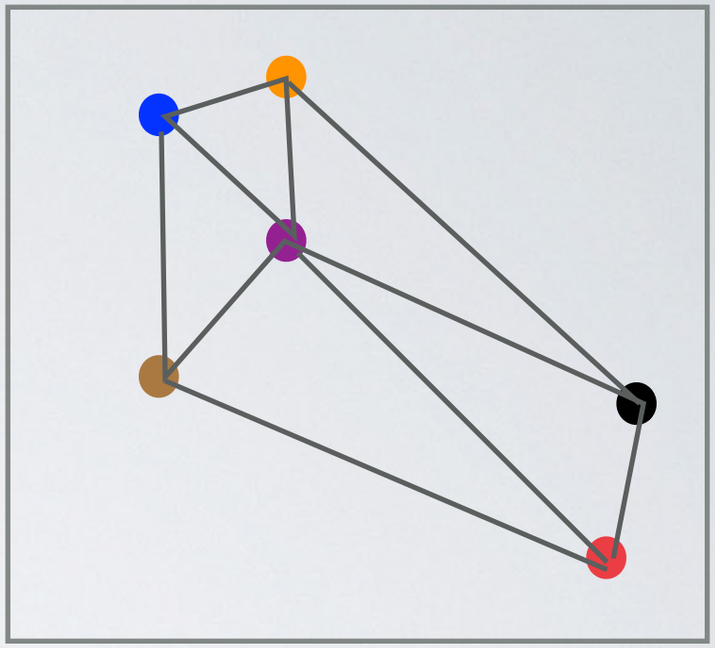
HOW TO
YouTube
WITH
LIVE STREAMING

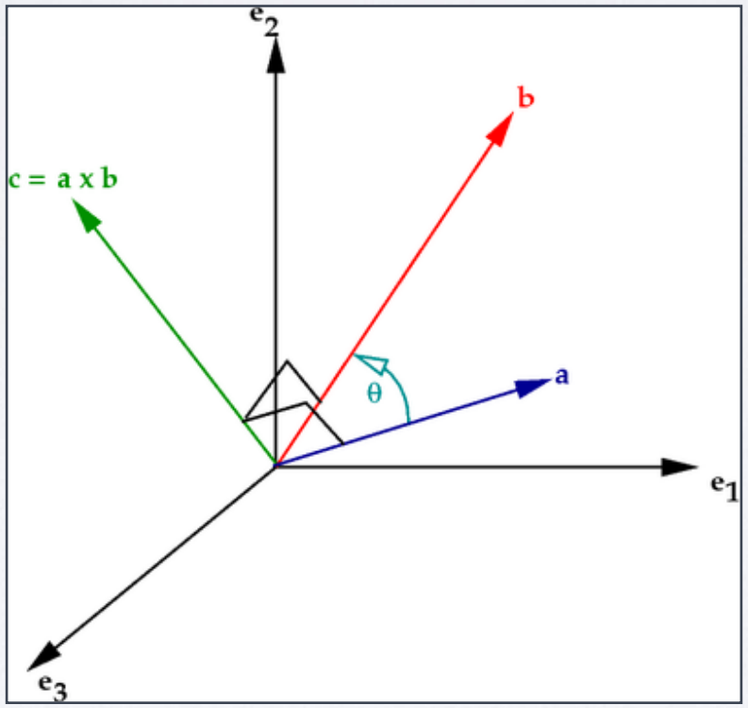
Doc2Vec



+

t-SNE





Vector Algebra

Summary

Summary

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THANK YOU !!!

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snakanda@iu.edu

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