



UNIVERSITY OF TARTU

# Social Media Diffusion Model



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# Aims of the study

To determine how viral Facebook posts spread in Estonian society.

To create a model to predict the diffusion of viral posts.



# Theoretical concepts

- **Viral:** Content that has great popularity because users spread it quickly and widely. Their spread is often driven by factors such as novelty, emotional resonance, or engagement triggers. (Berger & Milkman, 2012)
- **Diffusion:** The process by which viral content spreads through a social system. It often follows certain patterns or models and can be influenced by various factors such as network structure, social influence, and characteristics of the content or source. (Bakshy et al, 2012)
- **Filter Bubble:** A state of intellectual isolation that can result from personalized search queries when a website algorithm selectively guesses what information a user wants to see based on their location, past click behavior, and search history. (Pariser, 2011)
- **Echo Chamber:** Social epistemic structure from which other relevant voices have been actively excluded and discredited. Members of epistemic bubbles lack exposure to relevant information and arguments. (Nguyen, 2020)



# 10 posts (07.10 – 16.10.2022)

	Account metric			Post data				
	Friends	Followers	Total	Date	Reactions	Shares	Comments	Total
#1	0	31000	<b>31000</b>	12.10.2022	2360	376	73	<b>2809</b>
#2	5000	18657	<b>23657</b>	16.10.2022	2100	121	39	<b>2260</b>
#3	5000	14216	<b>19216</b>	16.10.2022	1260	78	45	<b>1383</b>
#4	2981	6071	<b>9052</b>	11.10.2022	1970	846	189	<b>3005</b>
#5	954	4746	<b>5700</b>	13.10.2022	666	349	106	<b>1121</b>
#6	1258	374	<b>1632</b>	07.10.2022	476	424	123	<b>1023</b>
#7	0	24000	<b>24000</b>	14.10.2022	1100	170	210	<b>1480</b>
#8	0	14000	<b>14000</b>	13.10.2022	1120	174	49	<b>1343</b>
#9	1310	0	<b>1310</b>	13.10.2022	1260	146		<b>1406</b>
#10	3400	14201	<b>17601</b>	13.10.2022	1150	53	45	<b>1248</b>





KerroMarilyn

2 d · 🌐

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Kodu on kindlus, kuhu peaks saama varjuda iga inimene või pereliige igal ajal kui raske. Ära ei tohiks ka unustada tema korrashoidu ja puhastust. Kirjutan Teile paar lihtsalt nippi oma kodu korrashoiuks ja puhastuseks! 1)Mida vähem külalisi- seda parem! Kodu on sinu pühakoda, kus peaksid külma ainult rangelt valitud inimesed! Sinu energiat leiab just nende seinte vahelt- nilet ole ettevaatlik, keda uksest sisse lased. 2) Kui elad majas, siis maja õmber võiks olla taim, mis ok...

See more



Tõnis Niinemets

3 d · 🌐

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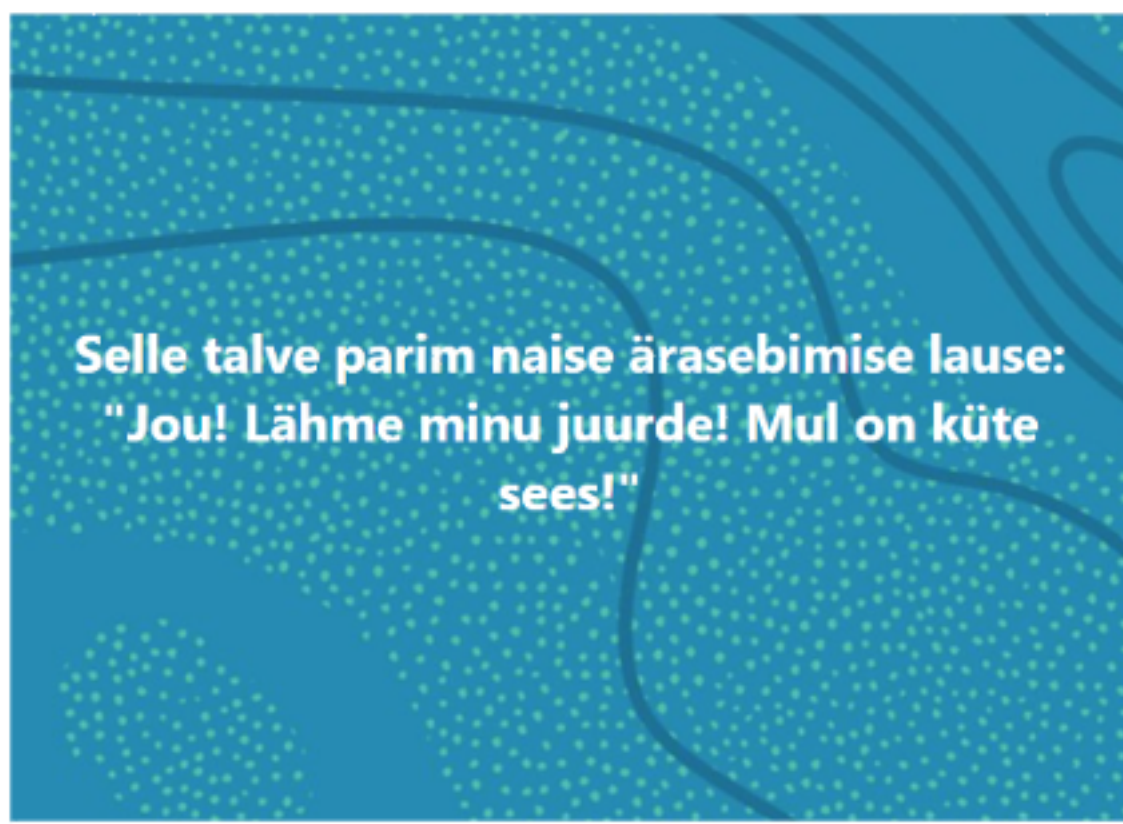
martin helme, mulle on jäänud mulje, et te olete alati austanud konkreetset arvamust ja ilma keerutamata jutustamist, olen selles osas teiega õhte meelt ning sellest lähtuvalt ka kirjutan. Teie Ukraina toetuse mitteallkirjastamisest on küll mitu päeva möödas, aga teema on siiani õhus. Kuulasin teie põhjendusi ja tundus kuidagi ebakonkreetne. Jah, mulle ka meeldiks kui igasuguste allkirjastamisega kaasneksid konkreetsed tulemused parema maailma suunas, aga antud juhul on küsimus, kas me saame vene riigi tegutsemisest Ukrainas samaselt aru või mitte. Ja tundub, et mitte. Mõistan, et te ei saa erakonnana anda oma valijale väksematki teemat, kus valitsuse ja Peaministriga samas paadis olla, aga siis õelge see ka igas teemas välja. Et valimised on tulemas ja that's it - ka sõja kontekstis. Ja suurele naaberriigile on teie poolt signaal "open for relationship". Ja üks palve on ka kui juba kirjutamiseks läks - äkki saab midagi selle poeeter ernitsaga ette võtta. Praegu veab ta riigikogu mainet ja intelligentsi mediaani keskmisest kõvasti allapoole. Ma saan aru, et valijaid on igasuguseid, aga no päris nii lol me rahvas ikka ka ei ole. Ikkagi Eesti eesti...või mida iganes te rahulikuks uinumiseks endale magamistoa lakke veekindla markeriga kirjutanud näete.



Vladas Radvilavičius

4 d · 🌐

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# Data collection

**10 viral posts**

**Offline quota sampling /  
Intercept interviewing**





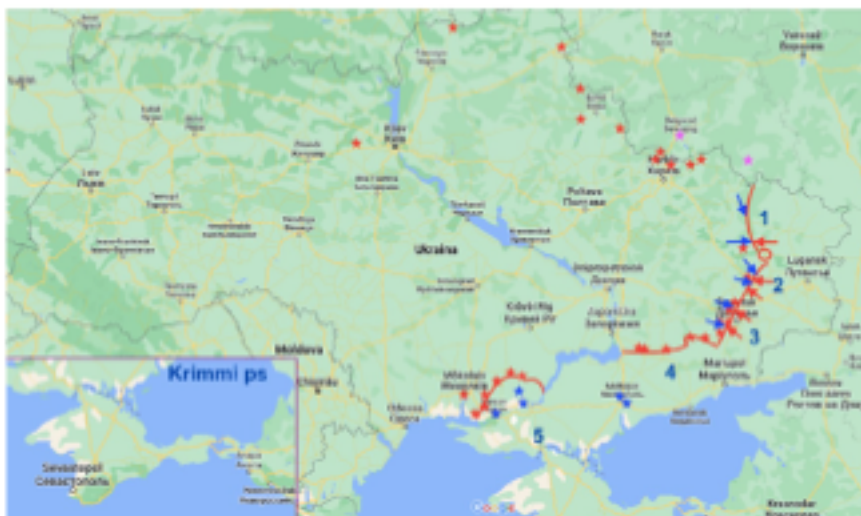
# 2



Igor Taro

UKRAINA PÄEVIK 15.10: Intsidendid piiriäärse Belgorodi oblastis Venemaal on hakanud korduma, vene okupantidele teeb muret ukrainlaste surve Hersoni oblasti põhjasuunal. Varem kõige keerulisemaks hinnatud Bahmuti suunal on olukord raske, kuid hetkel paistab stabiilne.

- Venemaa Belgorodi oblastis plahvatas naftabaasi ning leid aset tulistamine laskevõljal, kus on paarkümmend hukkunut.
- Luganski suunal püüavad vene okupandid tõrjuda ukrainlaste vastupealetungi jätkamist.
- Her... See more



**Kas olete seda postitust näinud?**

- Jah
- Võibolla
- Ei
- Ei oska öelda

**Kas olete seda kontot näinud?**

- Jälgin kontot
- Keegi on jaganud
- Ei tea seda kontot
- Ei oska öelda

**Kas see sisu on teile tuttav?**

- Jah
- Ei
- Ei oska öelda

Küsitaja kood  Kuupäev  Asukoht  Arkeedi nr

## SOTSIAALMEEDIA LÄBISTUSMUDEL

Küsitlusarkeedi

Sugu M  / N  Vanus  Tegevusvaldkond

Haridus

- Põhiharidus
- Keskeharidus
- Kõrseharidus
- Kõrgharidus
- Õpin praegu
- Muu
- Ei soovi vastata

Kui tihti külastate Facebooki (mitte Messengeri)

- Ei oma kontot
- Oman kontot, aga ei külasta
- Harvem kui kord nädalas
- Kord nädalas
- 2-3 korda nädalas
- Iga päev korda
- Iga päev mitu korda

	1	2	3	4	5	6	7	8	9	10
	Vladas	Igor	Varro	Peeter	Kaari	Brit	Jaak	Marilyn	Tõnis	Teet
<b>Kas olete seda postitust näinud?</b>										
Jah										
Võibolla										
Ei										
Ei oska öelda										
<b>Kas olete seda kontot näinud?</b>										
Jälgin kontot										
Keegi on jaganud										
Ei tea seda kontot										
Ei oska öelda										
<b>Kas see sisu on teile tuttav?</b>										
Jah										
Ei										
Ei oska öelda										

Lisainfo, märkused ja muud tähelepanekud



# Sample – quota and reality

	Groups	Target proportion	N	Real proportion
Sex	Male	47%	266	42%
	Female	53%	365	58%
Age	18-30	17%	185	29%
	31-45	27%	148	24%
	46-60	24%	143	23%
	61+	32%	147	23%
	NA		8	1%
Education	Primary	9%	36	6%
	Secondary	34%	205	32%
	Vocational	22%	119	19%
	Higher	35%	265	42%
	NA		6	1%

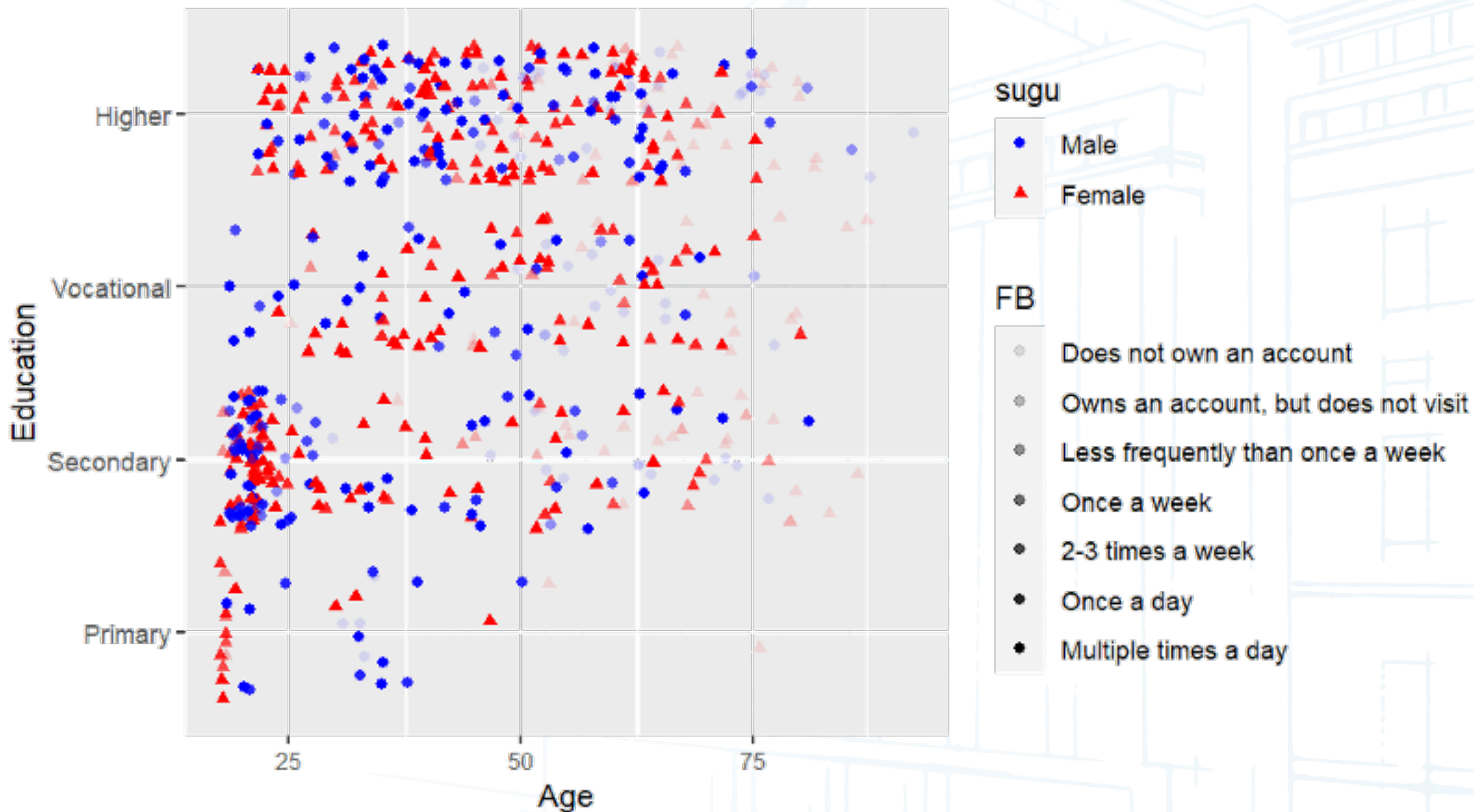


631

respondents

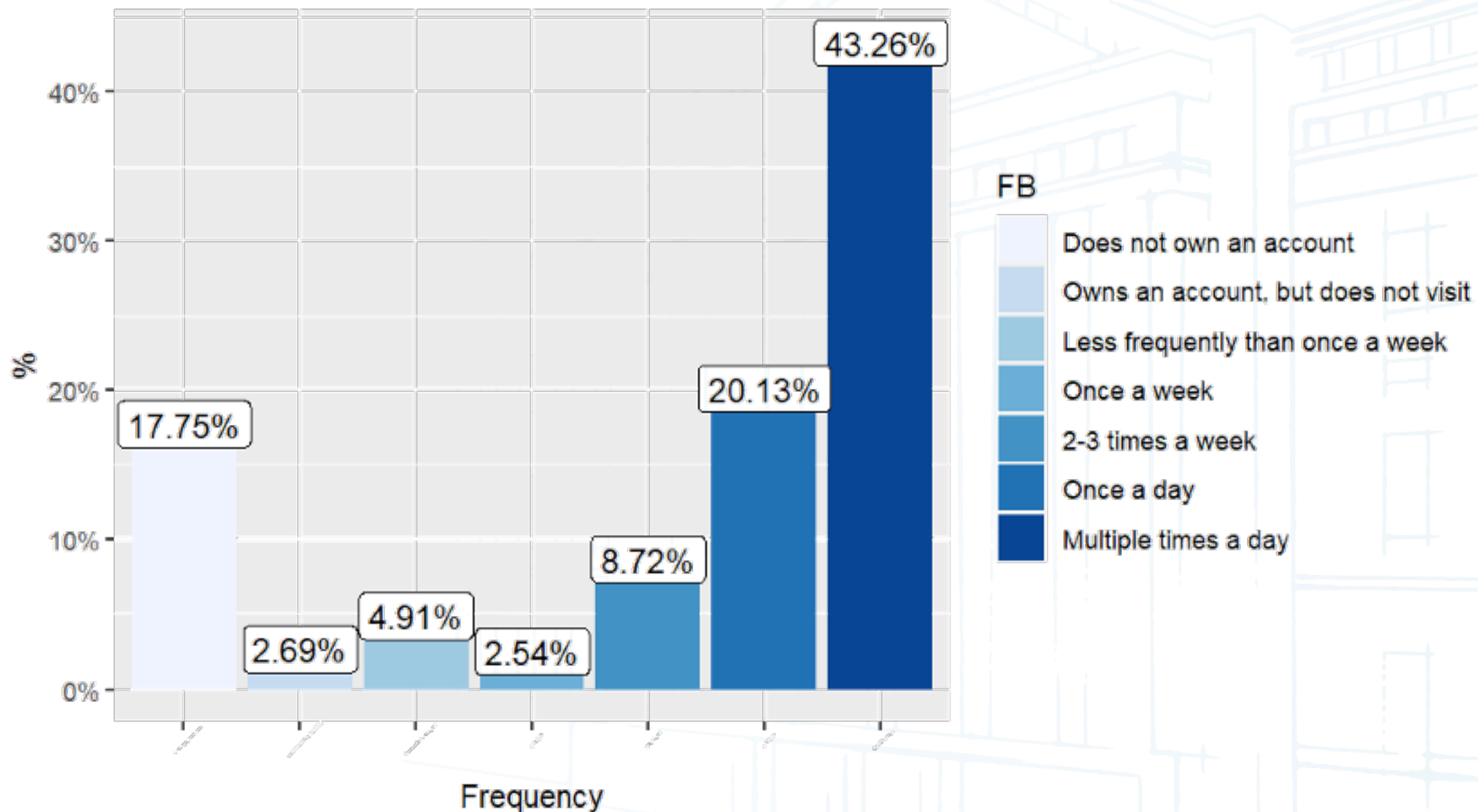
# Respondents by age, education, sex and frequency of FB visits

## Social Media Diffusion Model



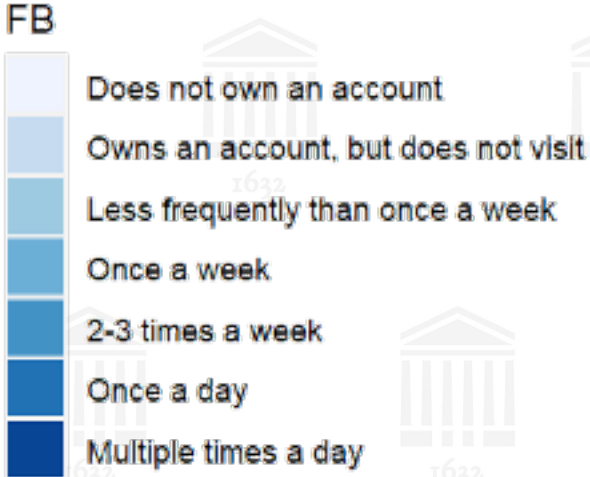
# How often do you visit Facebook? (Messenger doesn't count)

Social Media Diffusion model

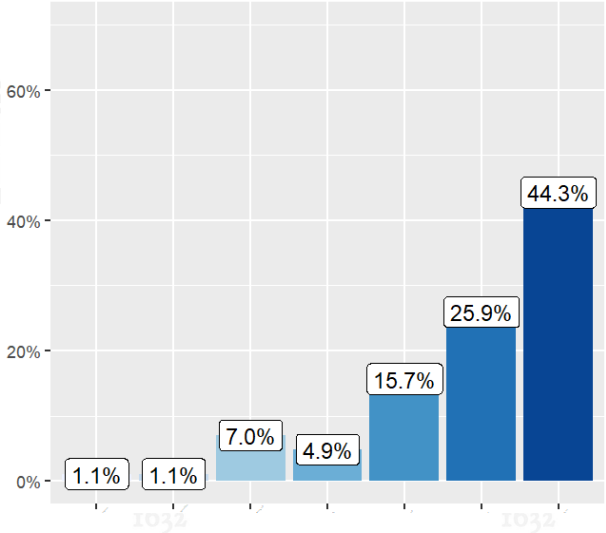




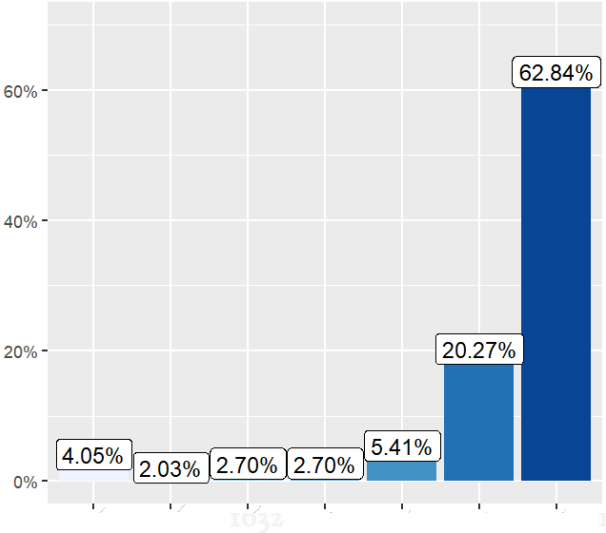
# Frequency of visiting Facebook by different age groups



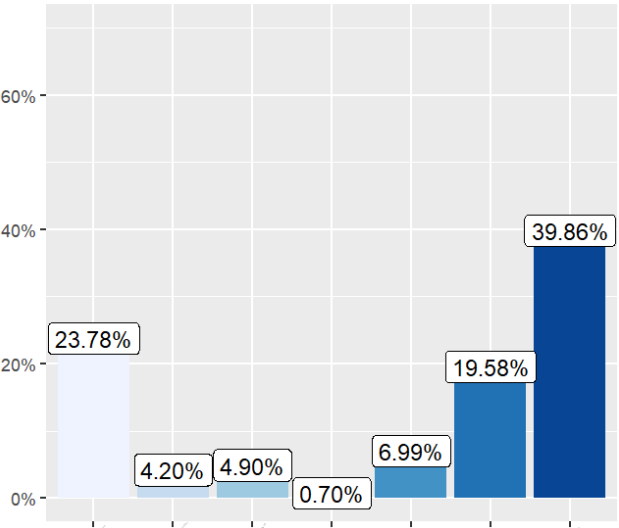
Age: 18-30 years



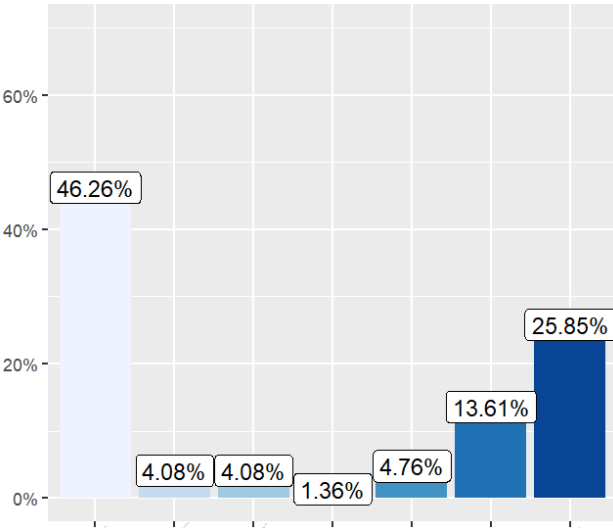
Age: 31-45 years



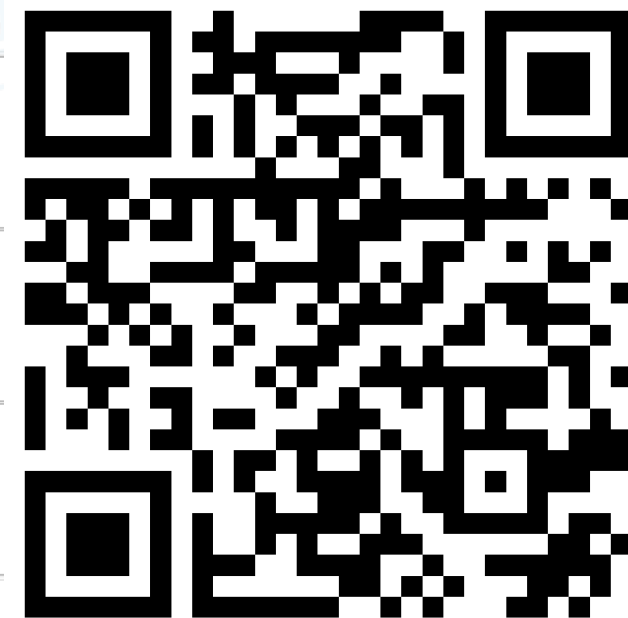
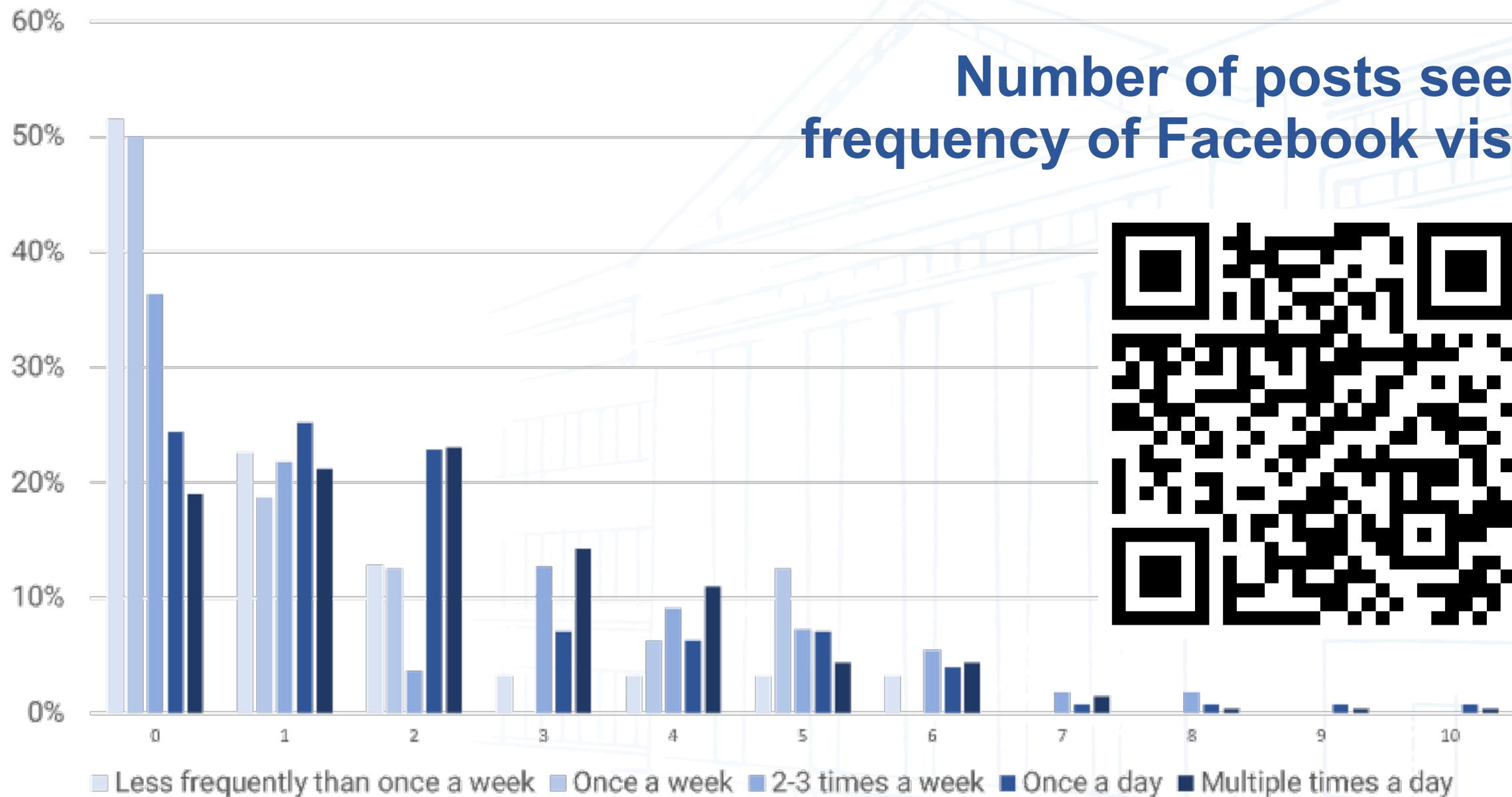
Age: 46-60 years



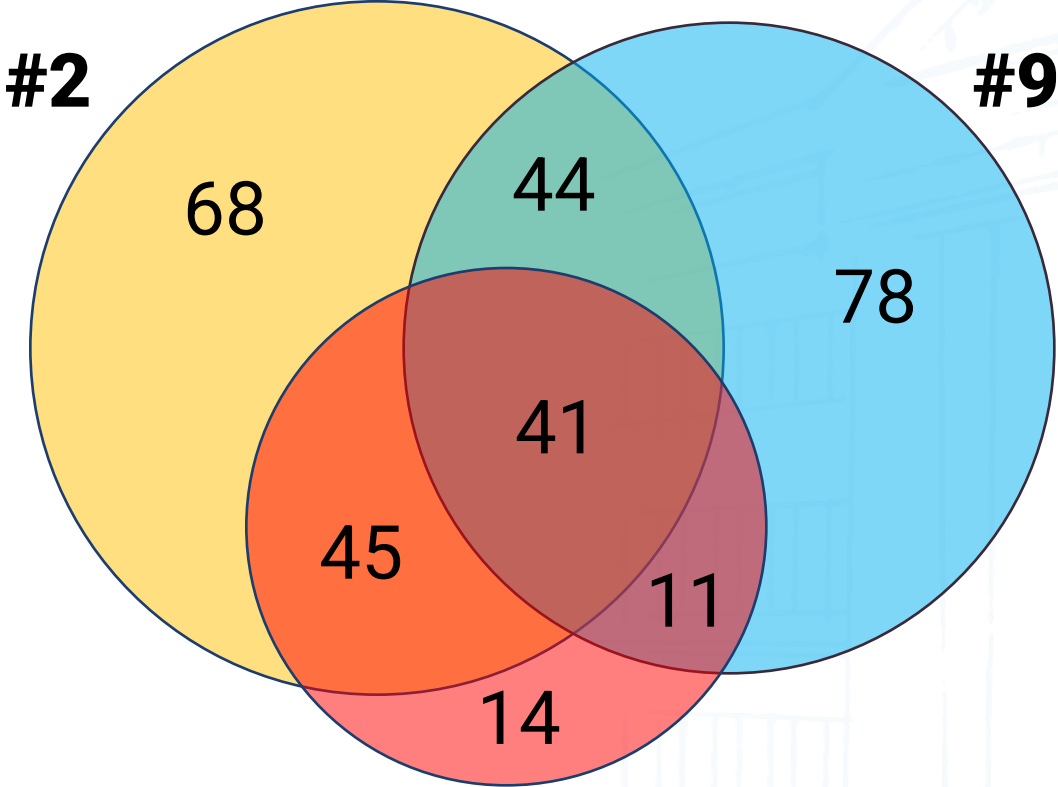
Age: 61+ years



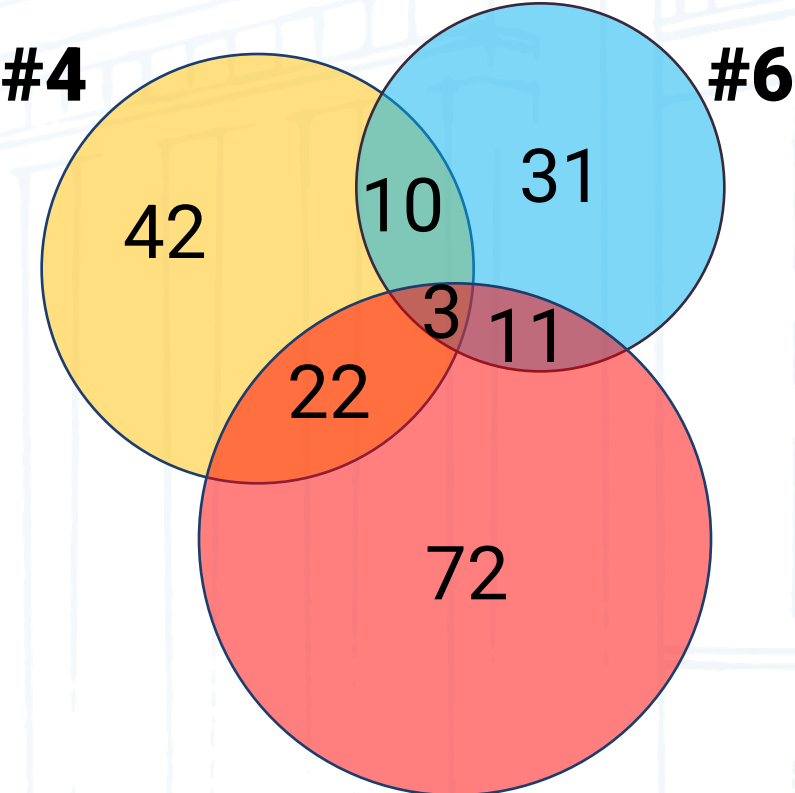
## Number of posts seen / frequency of Facebook visits



# Filter Bubbles or Echo Chambers?



3 post total views = 483  
Unique viewers = 301



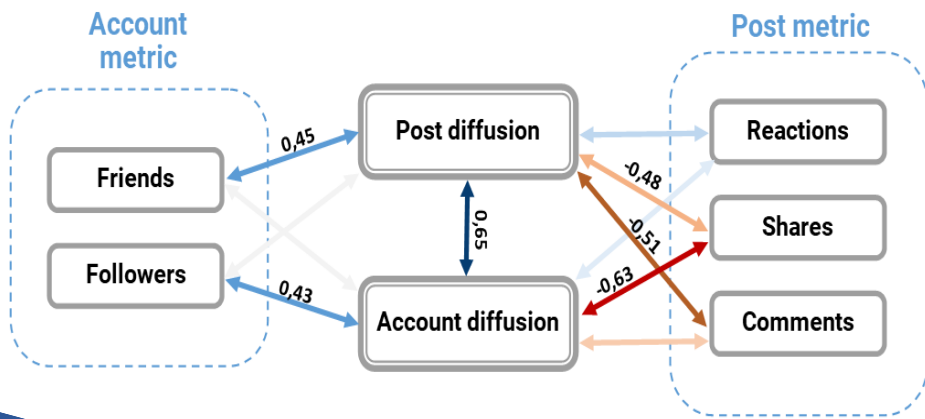
3 post total views = 240  
Unique viewers = 191



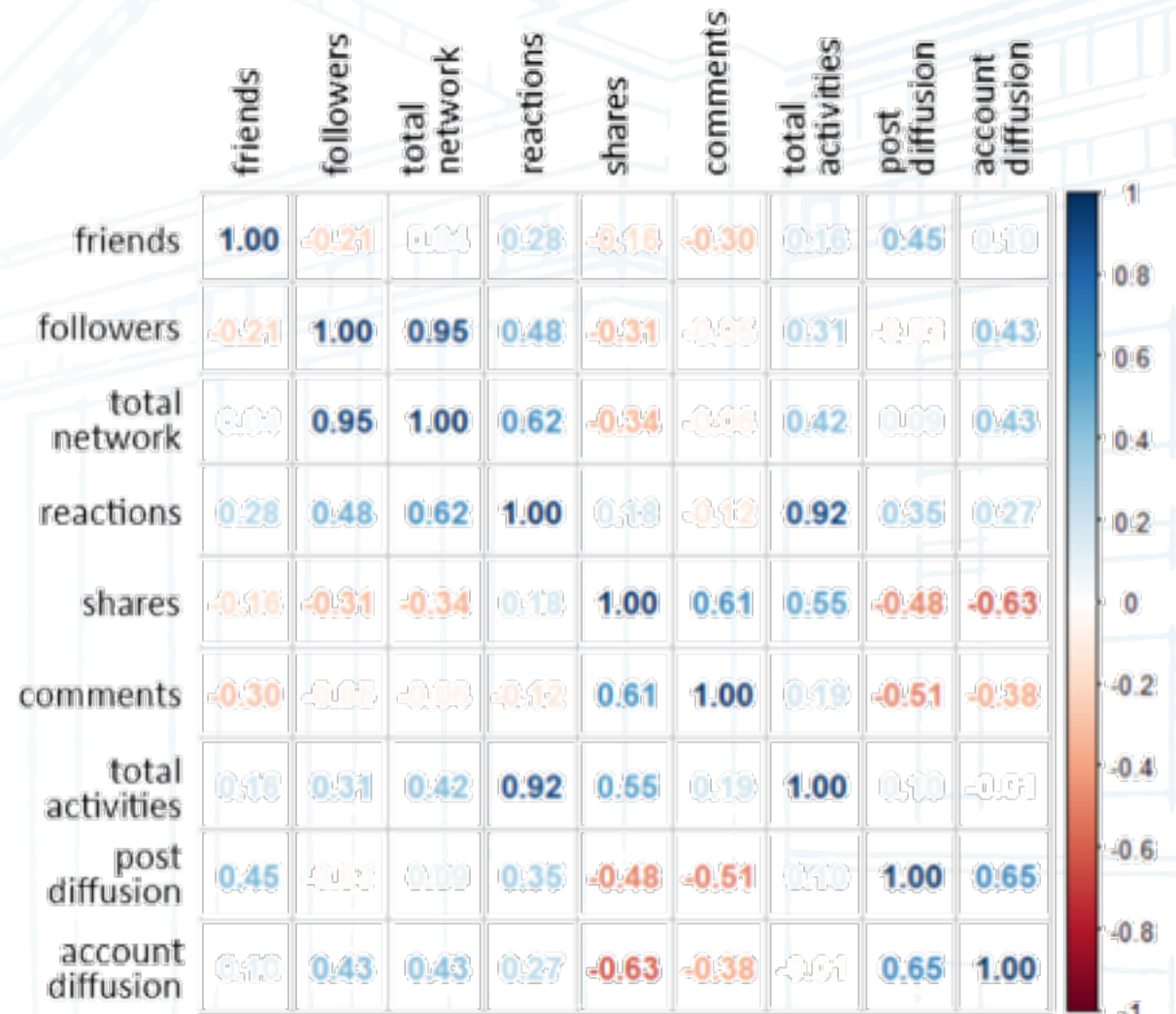
# Diffusion of posts



Post	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Diffusion	<b>10%</b>	<b>27%</b>	<b>13%</b>	<b>11%</b>	<b>10%</b>	<b>8%</b>	<b>14%</b>	<b>11%</b>	<b>25%</b>	<b>15%</b>
Network	31000	26329	19266	9092	5713	1659	24500	22500	1310	17738
Activities	2828	2415	1471	3029	1173	1071	1545	1360	1406	1259



# Correlation Matrix



# Comparison of Regression Models

	Independent Variable(s)	R <sup>2</sup>	p-value
<b>Model 1</b>	Shares	0,1374	0,1574
<b>Model 2</b>	Comments	0,1662	0,1331
<b>Model 3</b>	Reactions	0,0161	0,3153
<b>Model 4</b>	Shares, Comments, Reactions	0,1780	0,2752
<b>Model 5</b>	Friends, Followers	-0,0256	0,4533
<b>Model 6</b>	Total Network	-0,1151	0,0797
<b>Model 7</b>	Shares, Comments, Reactions, Total Network	0,7443	0,02392
<b>Model 8</b>	Shares, Comments, Reactions, Friends, Followers	0,4549	0,1975
<b>Model 9</b>	Total Activities, Total Network	-0,2792	0,9558



# Model 7

	Regression coefficient	SD	t	p
Shares (S)	-0,041	0,010	-4,196	0,00852**
Comments (C)	0,049	0,027	1,728	0,14455
Reactions (R)	0,016	0,003	4,406	0,00698**
Network Size (N)	-0,0008	0,0002	-3,931	0,01106**
Intercept	12,778	3,203	4,114	0,00923**



## Limitations of model

- The model was created based on data collected in the fall of 2022. Facebook's algorithm is constantly changing.
- The number of responses to individual posts ranged from 1071 to 3029, it is hard to tell how the model works outside of this range.
- The model is designed to provide estimates, but not exact results. Its application is limited to evaluating contributions that spread organically.
- The model was developed in Estonia, where there are about 1.3 million Estonian-speaking citizens, so the dynamics might be different in the English-language information space.



$$12,778 - 0,041 * S + 0,049 * C + 0,016 * R - 0,0008 * N,$$

where  $S$  – number of post shares,

$C$  – number of comments on post,

$R$  – total reactions to post and

$N$  – size of the post owner's network size (friends + followers).

# Social Media Diffusion Model

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