

MODELING MEMETIC DIFFUSION:

TOWARD AN INTEGRATIVE PREDICTIVE MODEL

SDSU/ICDRA

Lightning Talk

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MEMES AND EVOLUTION



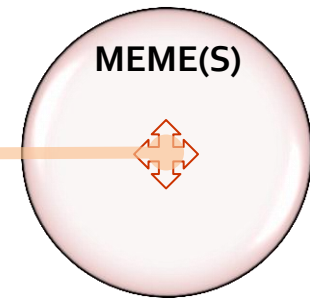
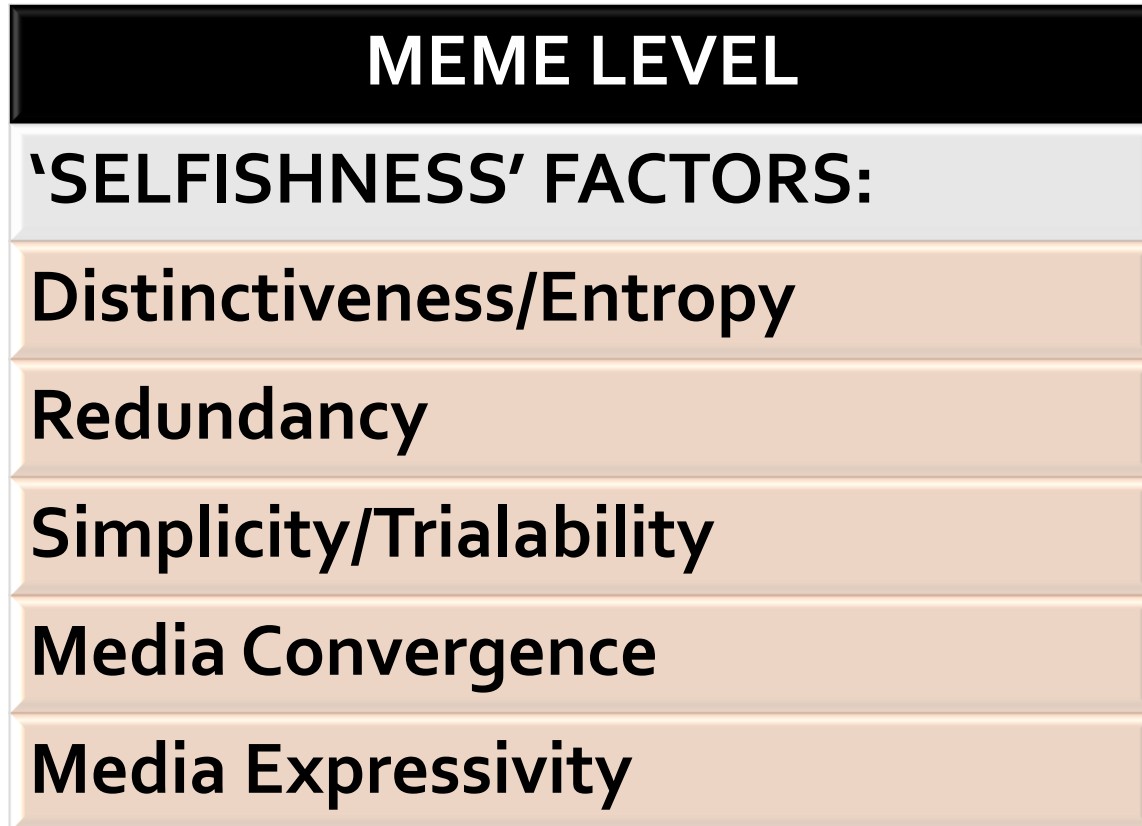
Meme: A *meme* is an act or meaning structure that is capable of *replication*, which means imitation (Dawkins, 1976).

Adaptive cooperation & competition:

“selfishness beats altruism within groups. Altruistic groups beat selfish groups. Everything else is commentary”
(Wilson & Wilson, 2007)



Multilevel Model of Meme Diffusion



Multilevel Model of Meme Diffusion

INDIVIDUAL LEVEL

COMPETENCE FACTORS:

Motivation

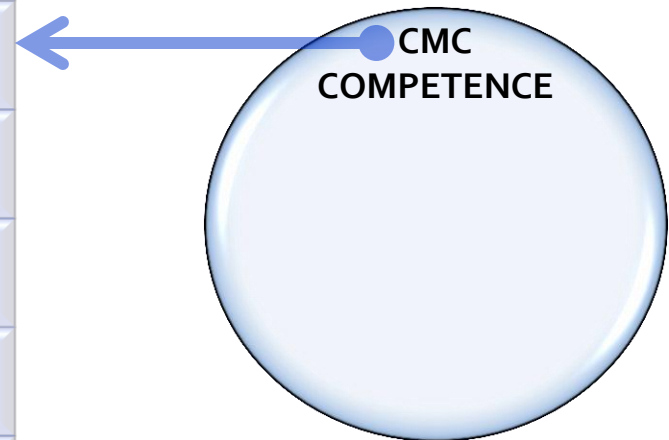
Knowledge

Skills

Message/Media Adaptation

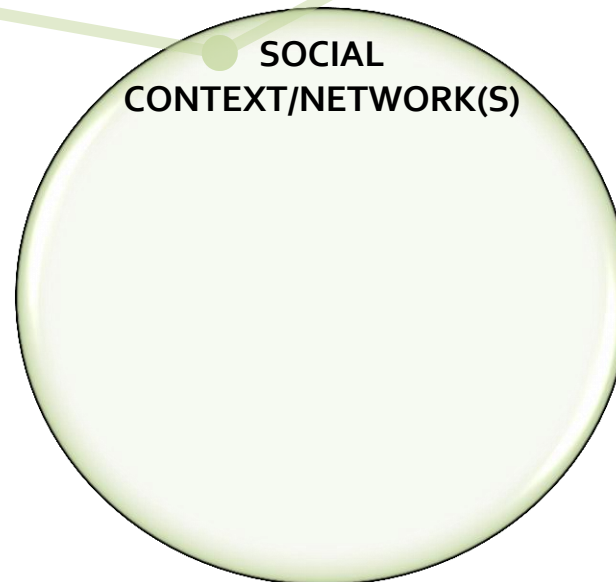
Attributed Source Ethos

Actor Centrality/Propinquity

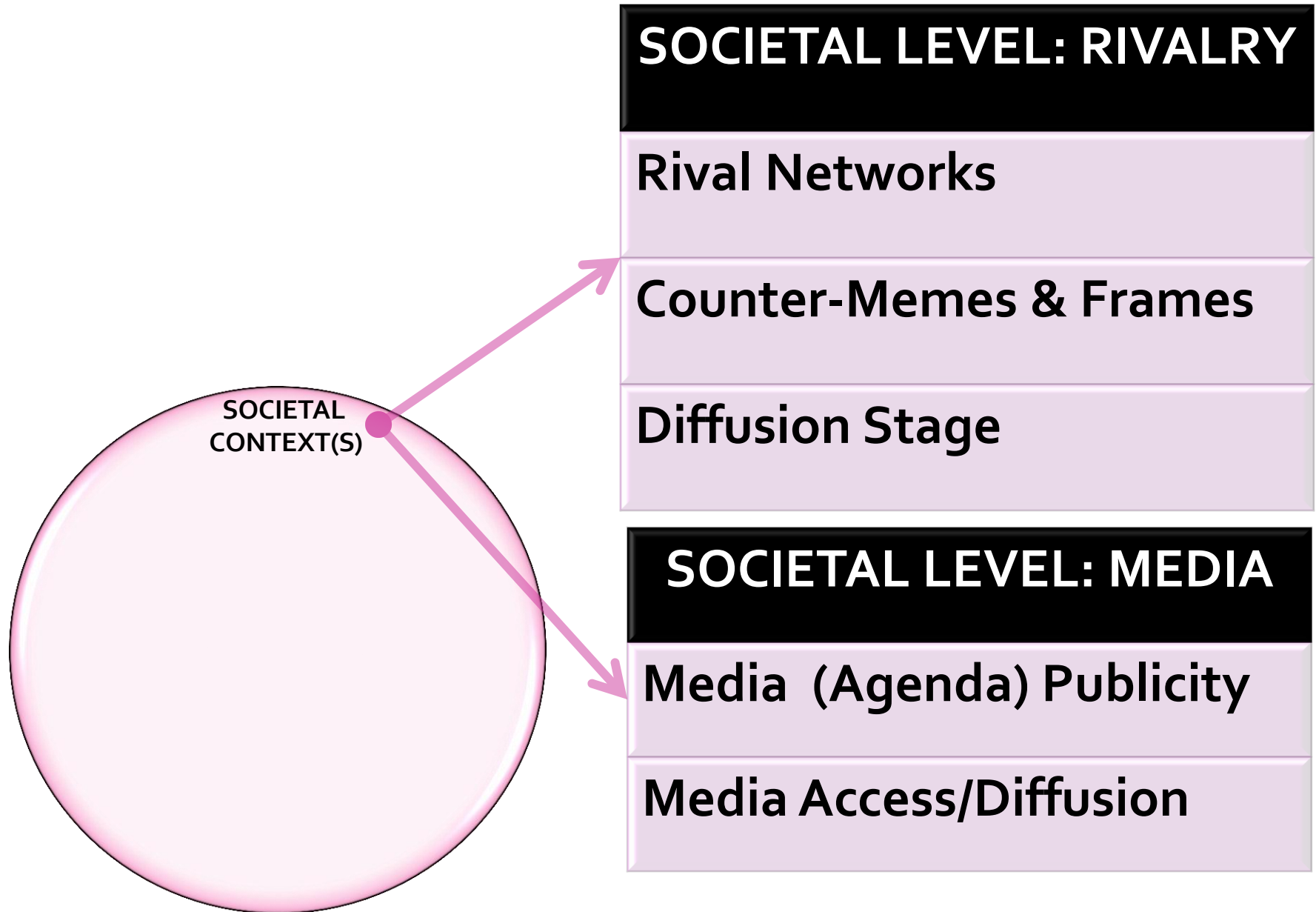


Multilevel Model of Meme Diffusion

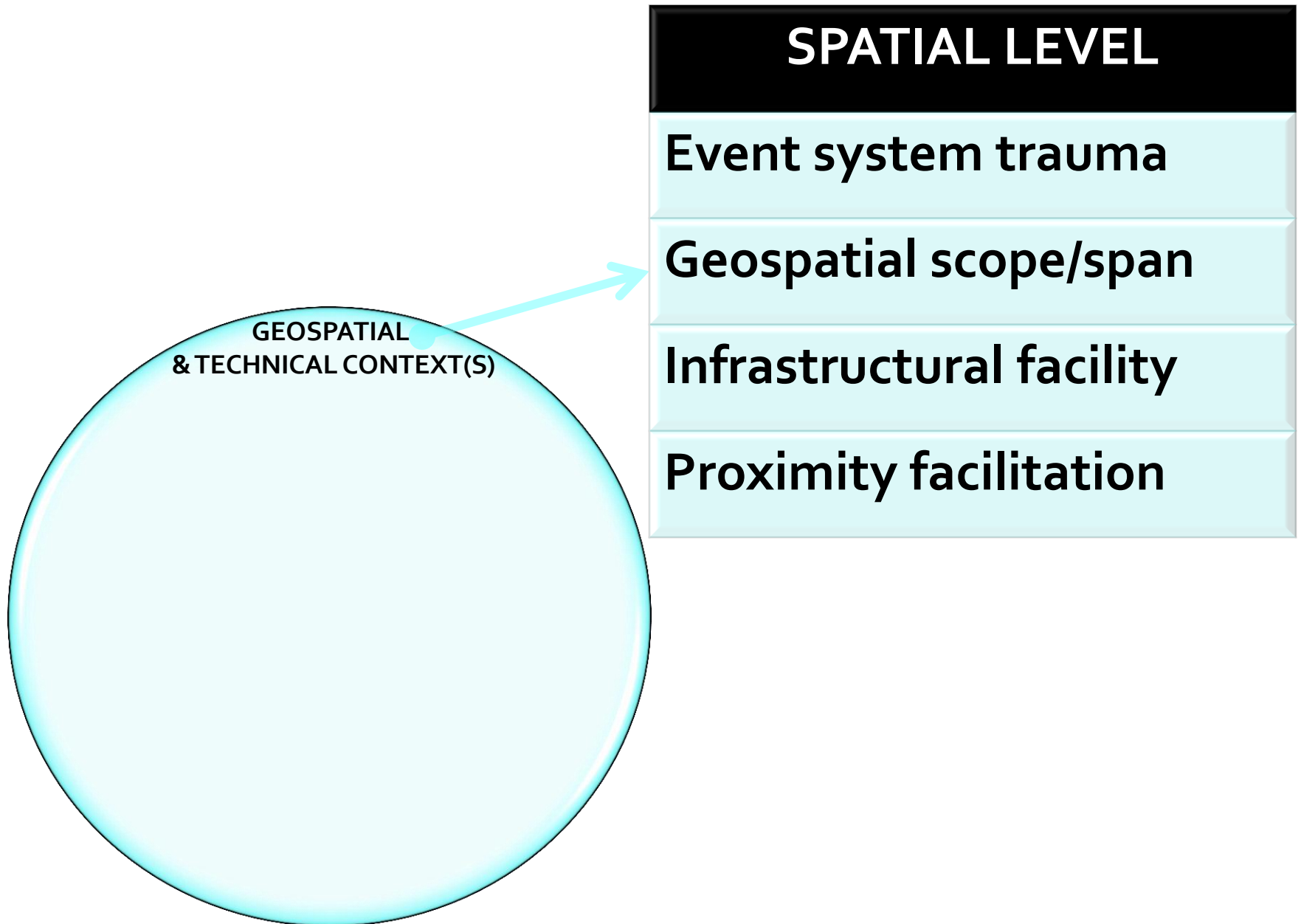
NETWORK LEVEL	NETWORK LEVEL
'ALTRUISM' FACTORS:	'ALTRUISM' FACTORS:
OBJECTIVE/STRUCTURAL	SUBJECTIVE/RECEPTIVENESS
N past memes (e.g., tweets)	Counter-Memes & Frames
N nodes (communicators)	Frame/Narrative Fidelity
Network homophily	Subjective Homophily
N/Centrality of Influencers	Niche: Relative Advantage
Task Interdependence	Cascade Threshold(s)



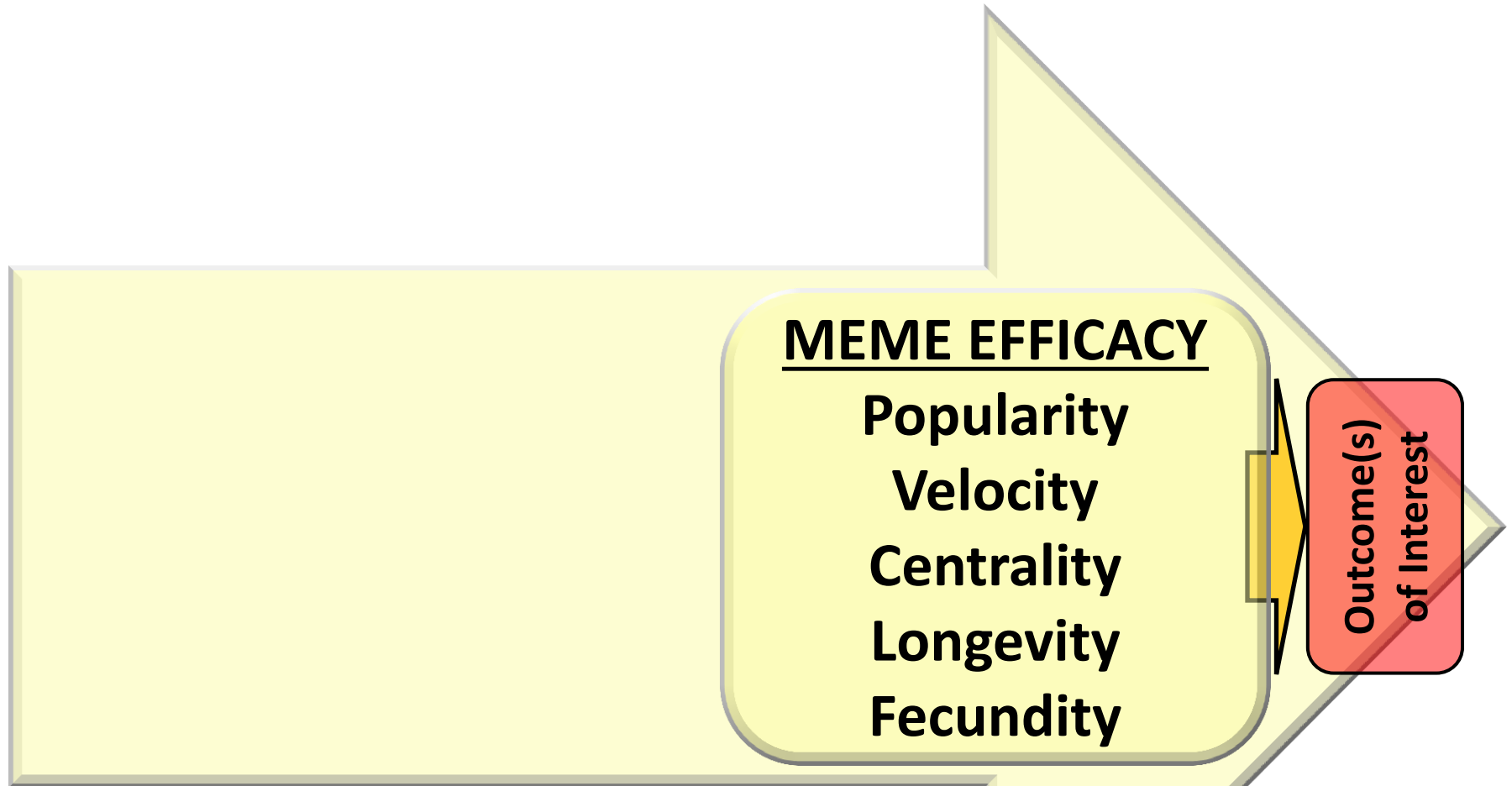
Multilevel Model of Meme Diffusion



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Multilevel Model of Meme Diffusion



MEME EFFICACY

Popularity

Velocity

Centrality

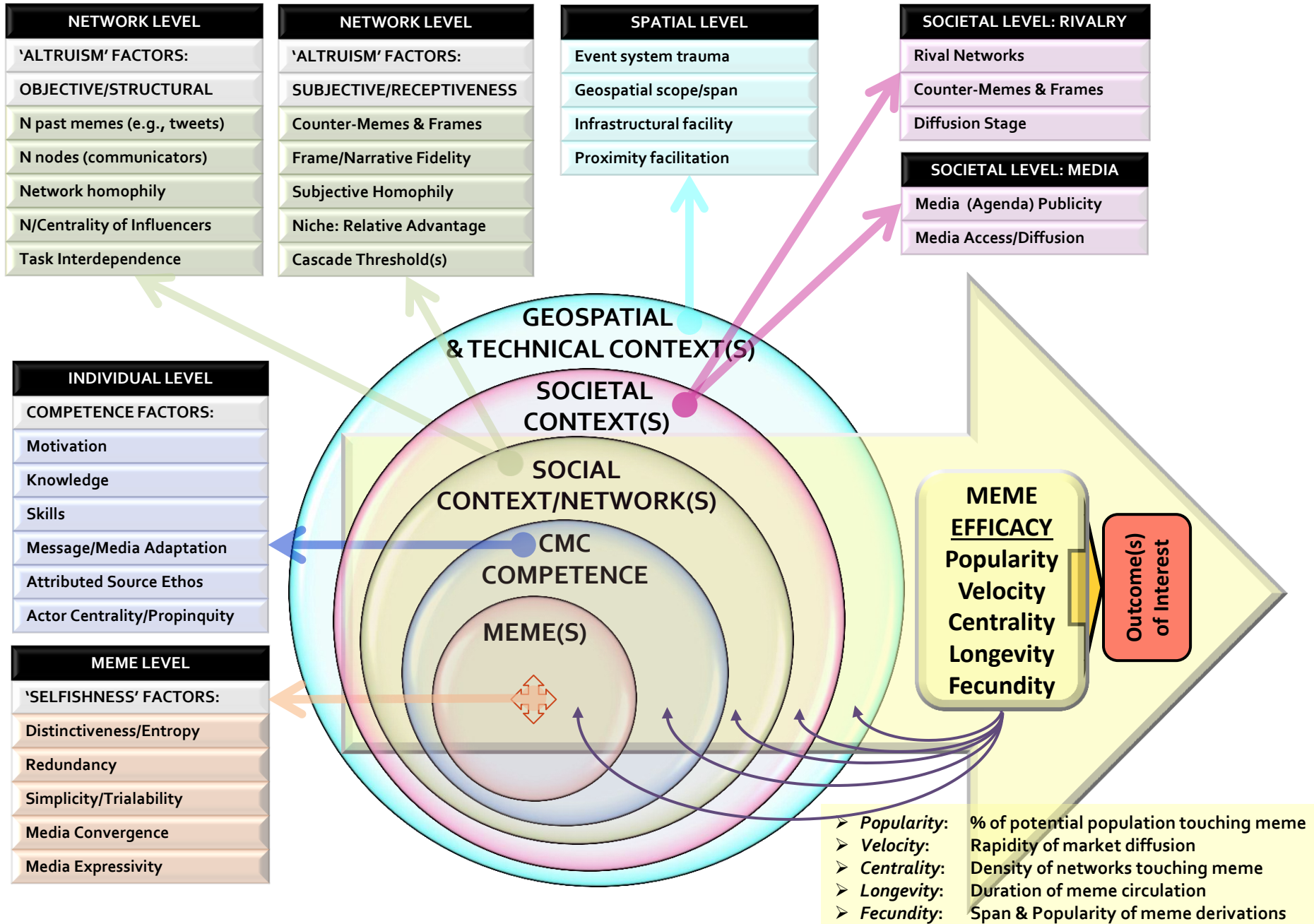
Longevity

Fecundity

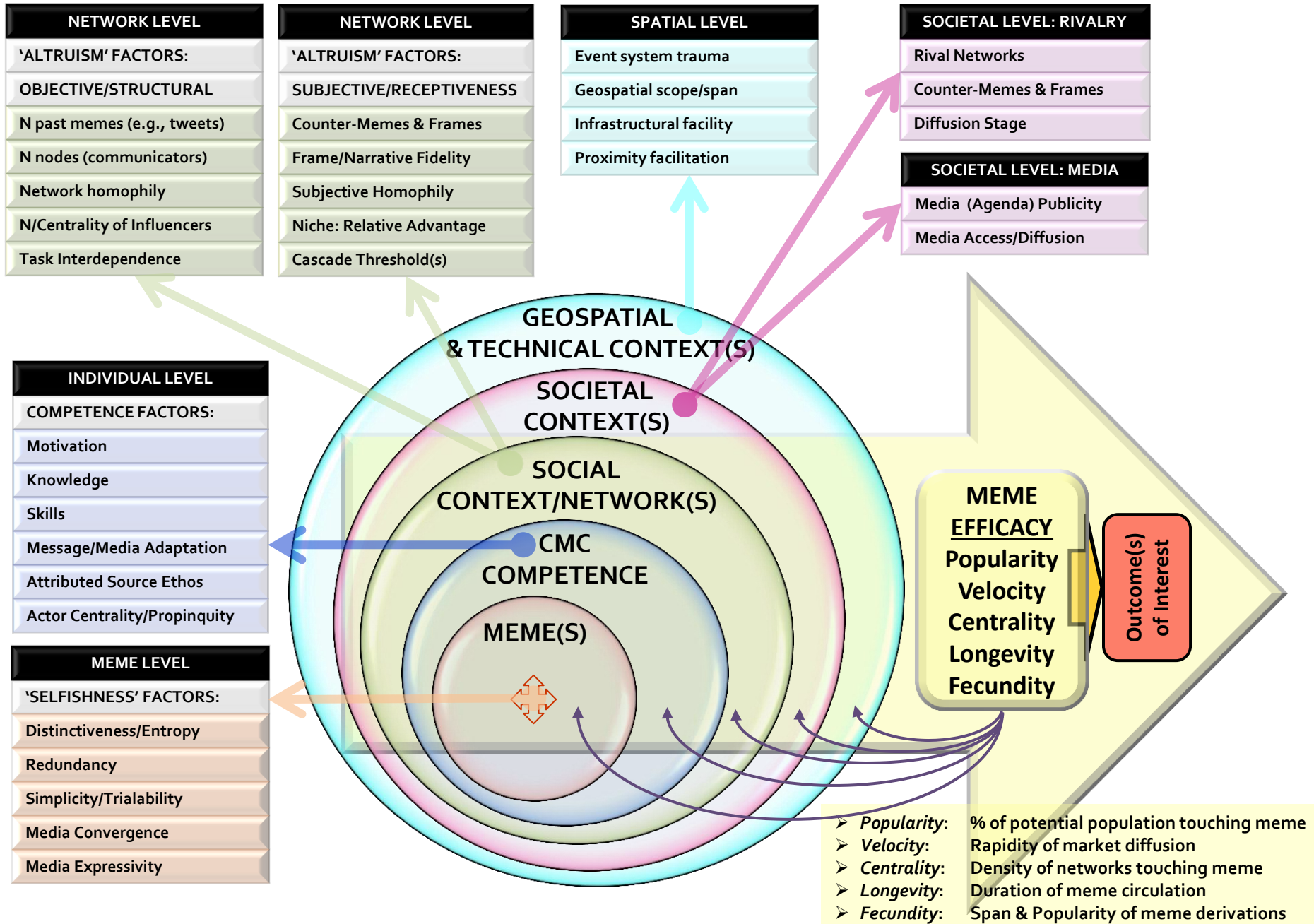
Outcome(s)
of Interest

- **Popularity:** % of potential population touching meme
- **Velocity:** Rapidity of market diffusion
- **Centrality:** Density of networks touching meme
- **Longevity:** Duration of meme circulation
- **Fecundity:** Span & Popularity of meme derivations

Multilevel Model of Meme Diffusion



Multilevel Model of Meme Diffusion



SYSTEM LEVEL		REPLICATION FACILITATORS	REPLICATION INHIBITORS
MEME		Redundancy-repetition¹ Simplicity-trialability Media convertability-convergence Media expressivity (presence/richness)	Message complexity
ACTOR		Motivation Knowledge Skills Media selectivity-adaptation Source ethos Actor centrality/proximity	Digital divide deficits² (e.g., lack of prior media access or experience)
SOCIAL NETWORK		N past resonant memes³ N (span) of network nodes Centrality (status) of influencers Task interdependence Narrative or frame fidelity (resonance)⁴ Subjective homophily or cohesiveness⁵ Relative advantage of meme	Network heterophily N counter-memes⁶
SOCIETAL		Earlier stages of adoption⁷ Agenda-setting promotion⁸ Media access (digital divide)	Rival social or media networks⁹ Counter-memes & frames¹⁰ Later stages of diffusion adoption¹¹ Agenda-setting resistance
GEO-SPATIAL/ TECHNICAL		Geospatial span or scope of resonance¹² Proximity facilitation¹³	Disruptive events (cascades, critical events) Infrastructural barriers to communication
EFFICACY (CRITERIA)		<ol style="list-style-type: none"> 1. Popularity: % of potential population touching meme 2. Velocity: Rapidity of market diffusion 3. Centrality: Density of networks touching meme 4. Longevity: Duration of meme circulation 5. Fecundity: Span & Popularity of meme derivations 	
OUTCOME(S) OF INTEREST		<ul style="list-style-type: none"> ➤ Political election outcome ➤ Movie box office ➤ Discrimination of militia/hate groups ➤ Geospatial disease diffusion ➤ Geospatial political attitude distribution ➤ Identification of vaccine prejudice ➤ Etc. 	

CONSTRUCTS, RELEVANCE & EXEMPLARS:

1. **Redundancy-repetition:** For example, the degree to which retweeting a movie title appears to positively reinforce further retweeting of that movie title.
2. **Digital divide deficits:** For example, the degree to which poor (low SES) geographic areas are less likely to request personal exemptions to vaccines (because they are more networked into media-biased views of vaccines? Because wealthy are more likely to put their children into charter schools, which reflect a higher priority on individual choice and freedom from government control?)
3. **N past resonant memes:** For example, did “Jasmine Revolution” morph into “Arab Spring”
4. **Narrative or frame fidelity (resonance):** For example, do certain search (ontology) terms “linguistically mark” resonant narratives and themes of militias, hate groups, etc.?
5. **Subjective homophily or cohesiveness:** Do hate, militia, and white supremacy groups (or 911 conspiracists, Obama a Muslim, and vaccination parental exception groups) swap (e.g., anti-government) memes?
6. **N counter-memes:** For example, do such groups create a consistent and resonant set of memes about groups with contrary values as a way of marking their groupness and “us-versus-them” ideologies (and thus, homophily)?
7. **Earlier stages of adoption:** Do movie title memes reveal a prototypical diffusion stage evolution?

CONSTRUCTS, RELEVANCE & EXEMPLARS:

9. **Agenda-setting promotion:** Do tweets about movies reveal responsiveness to studio promotional events?
10. **Rival social or media networks:** i.e., niche availability; for example, are anti-vaccination tweets “muted” or counteracted by government health communication campaigns?
11. **Counter-memes and frames:** Are some memes counteracted by being taken over by new memes—e.g., Do we forget about Libya and Anthony Wiener because of an NSA leak?
12. **Later stages of diffusion adoption:** Given that in later stages of diffusion there is “less information space” (niche) for (innovation) diffusion adoption, does this explain the decline of most memes (e.g., candidacy memes, “Arab Spring,” etc.)?
13. **Geospatial span or scope of resonance:** Demonstrating that searches for Mayoral names or candidate names during a regional primary are geospatially differentiated.
14. **Proximity facilitation:** Does the tendency of homophily bring similar kinds of people into geographic areas (e.g., wealthier neighborhoods) and thereby reinforce denser social networks and certain memes (e.g., anti-vaccination)?
15. **Popularity:** e.g., the number of tweets
16. **Velocity:** e.g., how rapidly tweets or web content spreads
17. **Longevity:** e.g., how long a meme (e.g., movie title meme) continues being popular
18. **Fecundity:** e.g., how many derivations of a given meme evolve out of the original meme