Analyzing Identity Clusters behind #sahm TikTok Creators: A Study on the Creator's Use of Hashtags and Their Suggested Niche Identities

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Introduction

Niche hashtags on TikTok are hyper-specific hashtags used by creators to categorize contents that would align themselves with specific identity communities (e.g., #sahmlife, #momsoftiktok, #breastfeedingjourney, #adhdmom). While some niche hashtags focus on relatable moments or personal storytelling (such as #momfail, #toddlermeltdown, #mentalmoments), others signal more stable identity positions tied to roles, values, or communities (e.g., #christianmom, #gentleparenting, #crunchymom).

As the hashtag #sahm (abbreviation for the term *Stay-At-Home-Mom*) has become increasingly popular on TikTok, this study investigates how #sahm creators construct and maintain distinct, personal identities through their use of niche hashtags.

Research Question

How do #sahm creators form and maintain niche identities on TikTok through their hashtag patterns?

Data & Methods

The data contains #sahm TikTok posts collected between 2018 to 2025, with all identifiable users' information removed.

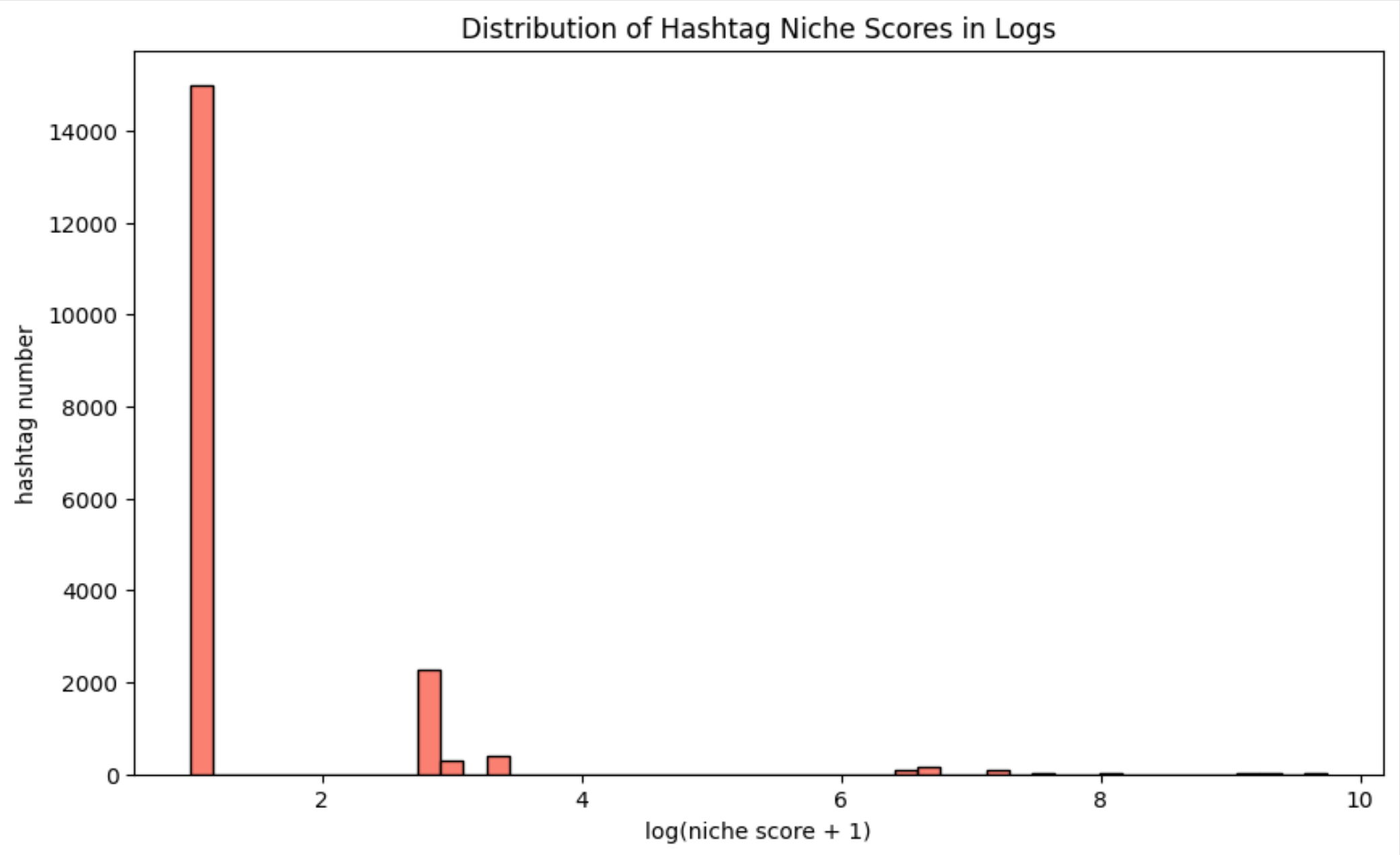
Definitions

- **Hashtag Co-occurrence Network**: identify and count the number of times each pair of hashtags has occurred together in a post
- **Louvain Method**: group nodes into communities by measuring how densely connected nodes are within groups compared to across groups
- **Niche Score**: measure how strongly a creator uses hyper-specific (niche) hashtags in their posts, with higher niche scores indicating more cluster-specific (niche) usage
- **Hashtag Communicative Function**: the role a hashtag plays in communication (e.g. it labels the topic, expresses a stance or identity, or connects the post to a specific community or trend)
- **Entropy Score**: measure how spread out or consistent a creator's hashtag usage is, with lower scores indicating the creator uses similar niche hashtags (more consistent identity)

Niche Hashtag Clusters Construction

- Build a **hashtag co-occurrence network table** from posts (11.7M hashtag pairs), keeping only pairs appearing **>= 50**
- Apply **Louvain community-detection algorithm** to the co-occurrence network to group hashtags into **14 identity-based clusters**
- Compute a **niche score** for each hashtag: within-cluster popularity (count / total count in the cluster) ÷ between-cluster popularity (count / total count)
- Draw a **distribution** of all hashtags' niche scores (log-scaled for interpretability) to select a threshold above which the hashtags would be "niche" (see Fig. 1)
- Set **niche cut-off** = **x ≥ 3**
- Create an indicator variable that identifies **864 hashtags** above the niche cut-off
- Remove overly broad or extremely rare hashtags from the 864 identified hashtags → end up with **480 niche hashtags**

Figure 1. Hashtag Niche Score Distribution (Log)

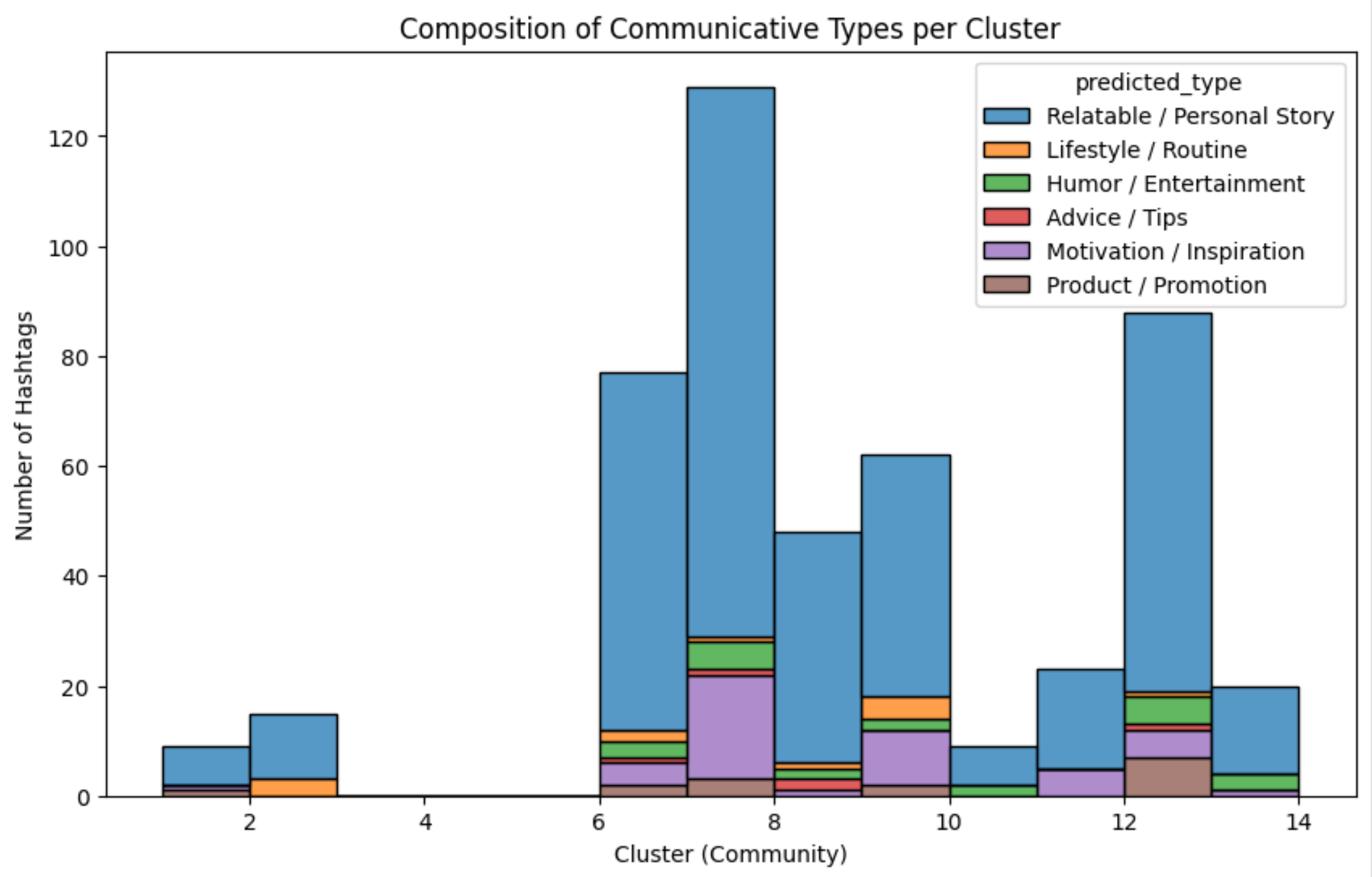


- Use **zero-shot learning** (classify new categories without any training examples) to categorize each niche hashtag into one of the **six communicative functions** (see Fig. 2)

Communicative Function Examples:

- Relatable / Personal Story: #sisterlove
- Dvice / Tips: #longdistance
- Lifestyle / Routine: #spreadlovenothate
- Humor / Entertainment: #ketolifestyle

Figure 2. Hashtag Cluster Communicative Type



Creator-level Identity Construction

- Extract niche hashtags (appearing in ~1% of posts) and assign them to each post
- Build a **post X niche-hashtag matrix** indicating which identities appear in each post
- Aggregate to the creator level to compute: **counts** of each niche identity used and **proportion** of their posts containing each identity

Identity Consistency

- Compute **a normalized entropy score** using the Shannon entropy formula: $\mathbf{H = -\sum p_i \log(p_i)}$, where p_i is the proportion of posts tagged with identity *i* with **higher H = more diverse identity usage**
- Assign **entropy score** to each creator to measure how consistently they position themselves across identities
- Classify creators by their entropy score and assign their consistency: **consistent** (< 0.25), **mixed** (0.25–0.55), **fluid** (> 0.55)

Creator Identity Clustering

- Apply **PCA** (a measure to capture the most **important patterns or variation** in the data) to reduce the high-dimensional identity space
- Use **k-means** (k = 8, the optimal cluster number chosen by Elbow Method: pick the point where the decrease levels off) to identify **major creator identity clusters**
- Each of the 8 clusters represents a group of creators who use **similar mixtures** of niche hashtags
- Compute creators' **principal component 1** (direction that gives the most variation) and **principal component 2** (direction that gives the second-most variation) from **PCA**
- Visualize cluster groups in PCA space and **identify separated clusters**: creators who rely on a distinct and rare set of **niche identity hashtags** that are **not shared** with other creator communities

Identity Network Structure

- Compute **cluster adjacency & nearest neighbors** to detect overlap between clusters: only **~2.25%** of creators show overlapping identity profiles
- Calculate **identity co-occurrence** across creators and remove rare pairs (< 20 creators)
- Identify **bridge identities** (identities that co-occur widely and connect multiple clusters)

Within-Cluster Dynamics

- Measure **identity switching** over time
- A creator is **persistent** if switch rate < 0.3, and dominant cluster > 70% of their posts
- Draw **distributions** of within-creator consistency and fluidity across each cluster (see Fig. 3 & 4)

Final Data Frames:

- **Post DataFrame**: contains IDs for creators and posts, list of hashtags, and list of niche hashtags
- **Hashtag DataFrame**: contains a binary indicator that identifies if the hashtag is niche and cluster assignments for all hashtags
- **Creator-level DataFrame**: contains a vector describing which niche hashtags the creator has used and cluster label for each creator

Figure 3. Within-Creator Consistency

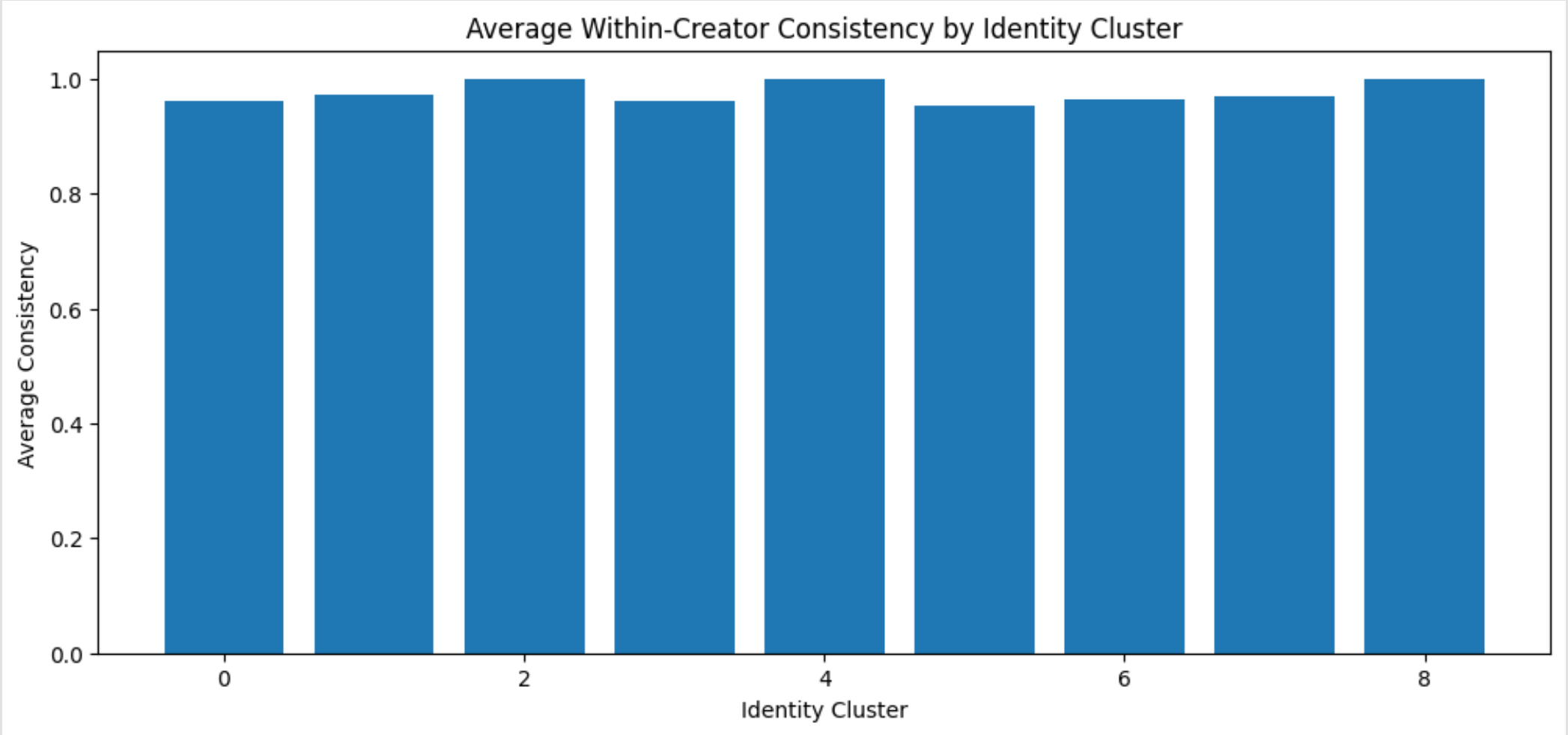
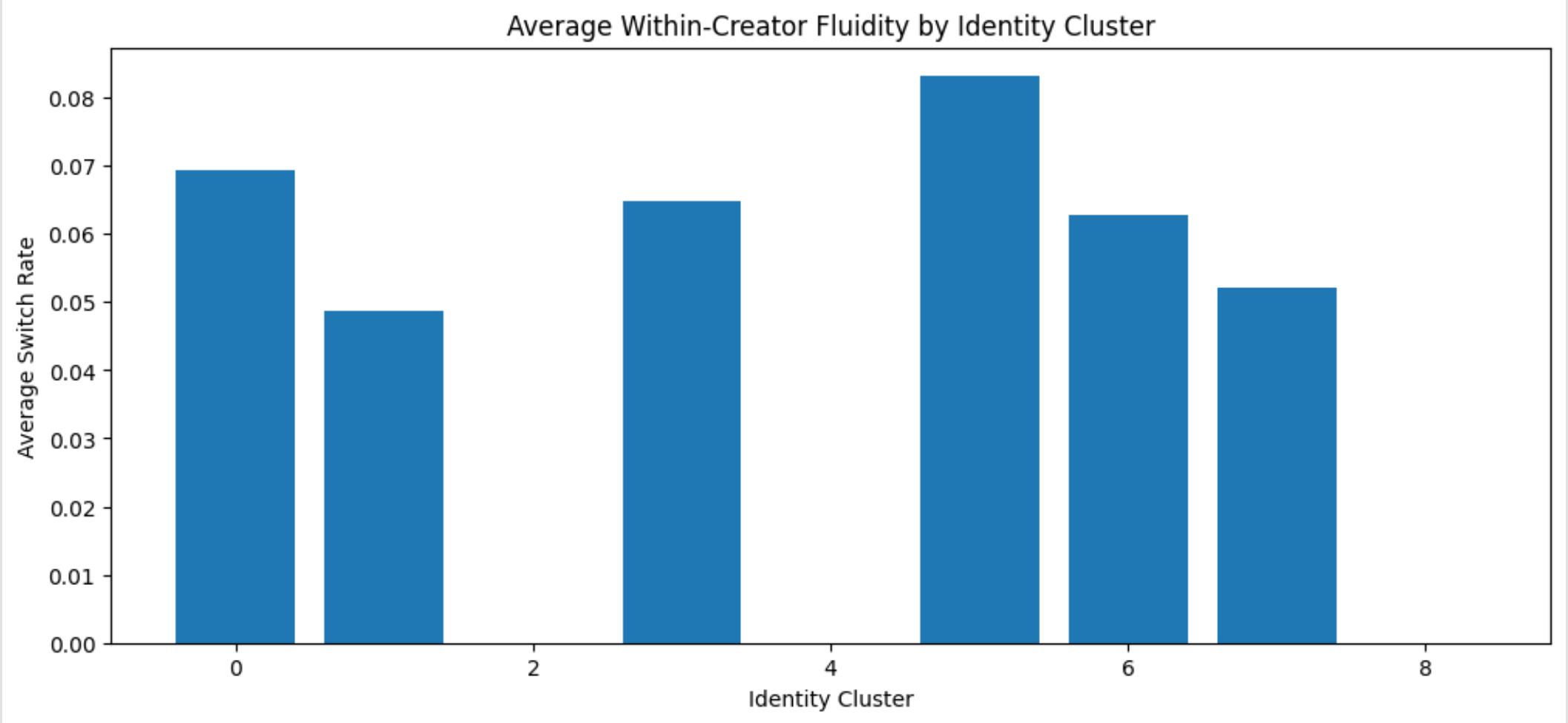


Figure 4. Within-Creator Fluidity



Results

- **Relatable / Personal Story** is the dominant communicative type across niche hashtag clusters, which indicates that creators primarily use niche hashtags to frame content through personal and relational narratives.
- About **99.97%** of creators maintain a consistent identity style, with **0.02%** of mixed style creators, and **0.01%** of fluid creators, which indicates minimal identity switching across posts.
- Cluster 1 (six creators) and Cluster 2 (one creator) **do not share** identity patterns with any other creator identity clusters (macro-level). In contrast, all remaining clusters exhibited **overlapping identity patterns**, suggesting shared identity signals across creators.
- Cluster 2 (size of 27), Cluster 4 (size of 1), and Cluster 8 (size of 3) are **perfectly dominant** with an average dominance proportion of 1.0 and a switch rate of 0.0.
- Cluster 5 has the **highest** switch rate of 8.3%.
- The top 3 identities in Cluster 2 are: "girlsthatwearjewelry", "stainlesssteeljewelry", and "goldplatedjewelry"
- The top 3 identities in Cluster 4 are: "gratefulthankfulblessed🙏🏻", "mamaof3💙💜💙", and "wifey💍"
- The top 3 identities in Cluster 8 are: "mamabearof4", "mammabearof4", and "hallowsmonth"
- Top 5 co-occurring identity pairs & Top 5 bridge identities:

Identity 1	Identity 2	Count
acotar	sarahjmaas	54
reader	readersoftiktok	44
acotar	fourthwing	37
bookrecs	romancebooks	35
acotar	sjm	34

Bridge Identity	Count
ex	974
bookrecs	861
acotar	849
psychic	845
psychicreading	826

Conclusion

- #sahm creators form **highly stable niche identities** [99.97% maintain a consistent persona]
- Many clusters show **perfect identity dominance** [creators post exclusively within one niche]
- Cluster 1 & 2 are **uniquely distinct** and have no shared identity pattern
- Cluster 5 show **notable cross-identity** behavior [creator navigate several adjacent niches (identity bridges)]
- Highly specialized niche identities in Cluster 2, 4, and 8 reveal **micro-communities**
- There's **shared / overlapping communities** within #sahm indicated by the co-occurring identity pairs

In short, most #sahm creators **don't constantly change** their only persona. They stay with **one niche** and use hashtags that match that niche, which builds **small, stable communities** with their own styles and identities on TikTok.

Acknowledgements

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