# THE IMPACT OF SEMANTIC CONTEXT CUES ON THE USER ACCEPTANCE OF TAG RECOMMENDATIONS: AN ONLINE STUDY

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## MOTIVATION

- Tag recommendations support users in finding tags for bookmarks

- Large body of offline evaluation studies, which measure prediction accuracy rather than "real user acceptance"

- Three factors are especially important: 1. frequency, 2. recency (narrow & broad folksonomies), and 3. semantic context (broad folksonomies)

- This study has two goals:

  1. Contribute to the sparse line of **online evaluation results**

  2. Test **hypothesis**: semantic context cues have a **higher impact on user acceptance** in collaborative than individual settings

## METHOD

- Compare context-unaware algorithm $MostPop$ with context-aware algorithm $3Layers$ (using categories)

- $MostPop$ recommends the overall most frequently used tags and $3Layers$ is based on human categorization model MINERVA2 (see illustration)

- **To test:** Acceptance of $3Layers$ > $MostPop$ in **collaborative setting** but no difference in individual one
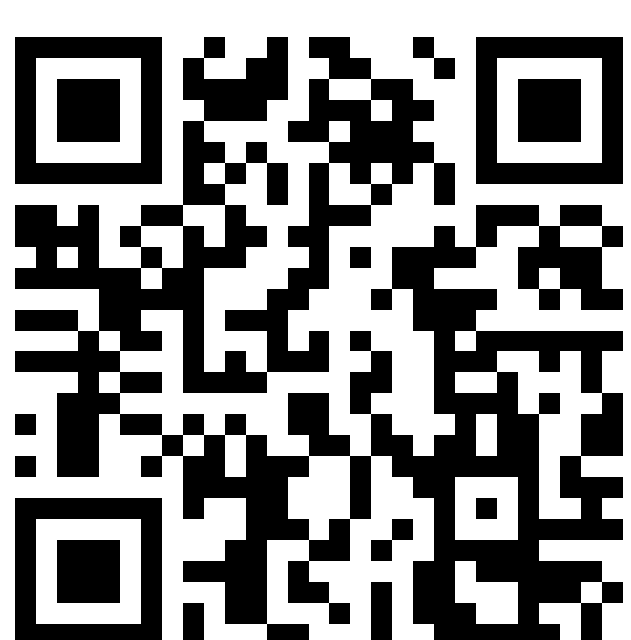
## STUDY DESIGN & DATA

- Work-integrated bookmarking scenario: 17 university employees bookmarked resources for 4 weeks (topic: designing workplaces)

- They were split into 2 groups (individual & collaborative) and supported with tag recommendations (random choice of $MostPop$ & $3Layers$)

| Setting | $|T|$ | $|TA|$ | $|B|$ | $|MP|$ | $|3L|$ |
|---|---|---|---|---|---|
| Indiv. | 119 | 191 | 53 | 29 | 24 |
| Collab. | 127 | 262 | 62 | 29 | 33 |
| Full | 213 | 453 | 115 | 58 | 57 |

## JOURNAL & FRAMEWORK

[1] Seitlinger, P., Ley, T., Kowald, D., Theiler, D., Hasani-Mavriqi, I., Dennerlein, S., Lex, E., & Albert, D. (2017). Balancing the Fluency-Consistency Tradeoff in Collaborative Information Search with a Recommender Approach. *International Journal of Human-Computer Interaction*. T&F.

[2] Kowald, D., Kopeinik, S., & Lex., E. (2017). The TagRec Framework as a Toolkit for the Development of Tag-Based Recommender Systems. In *UMAP*. ACM.

https://github.com/learning-layers/TagRec/

## KNOWBRAIN: COLLECTING AND TAGGING RESOURCES

**KnowBrain (a) provides a social tagging interface (b) to collect Web resources (no. 1), classify them by choosing from a list of pre-defined categories / context cues (no. 2), receive a set of recommended tags (no. 3), and choose (no. 4) / add tags (no. 5).**
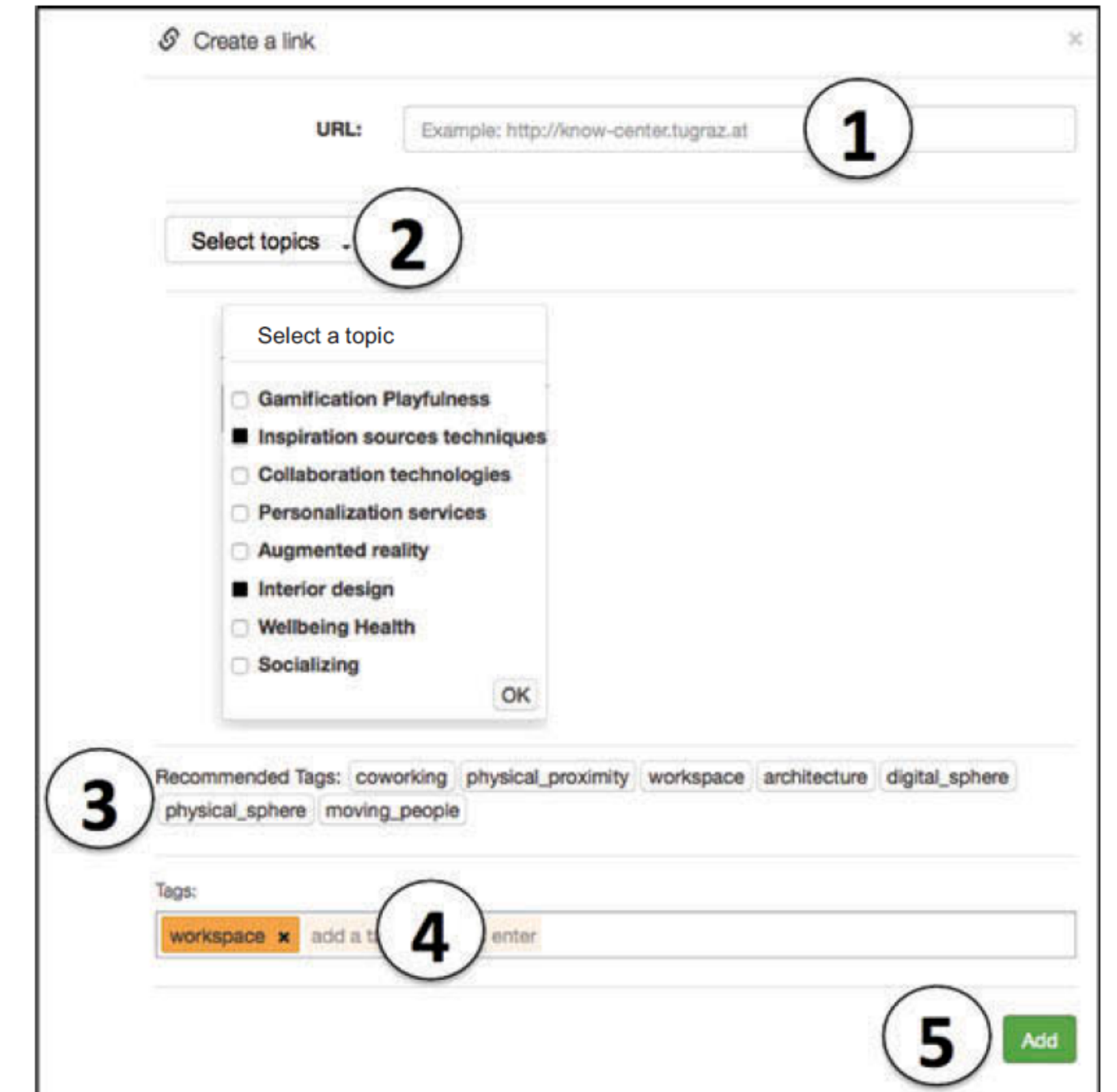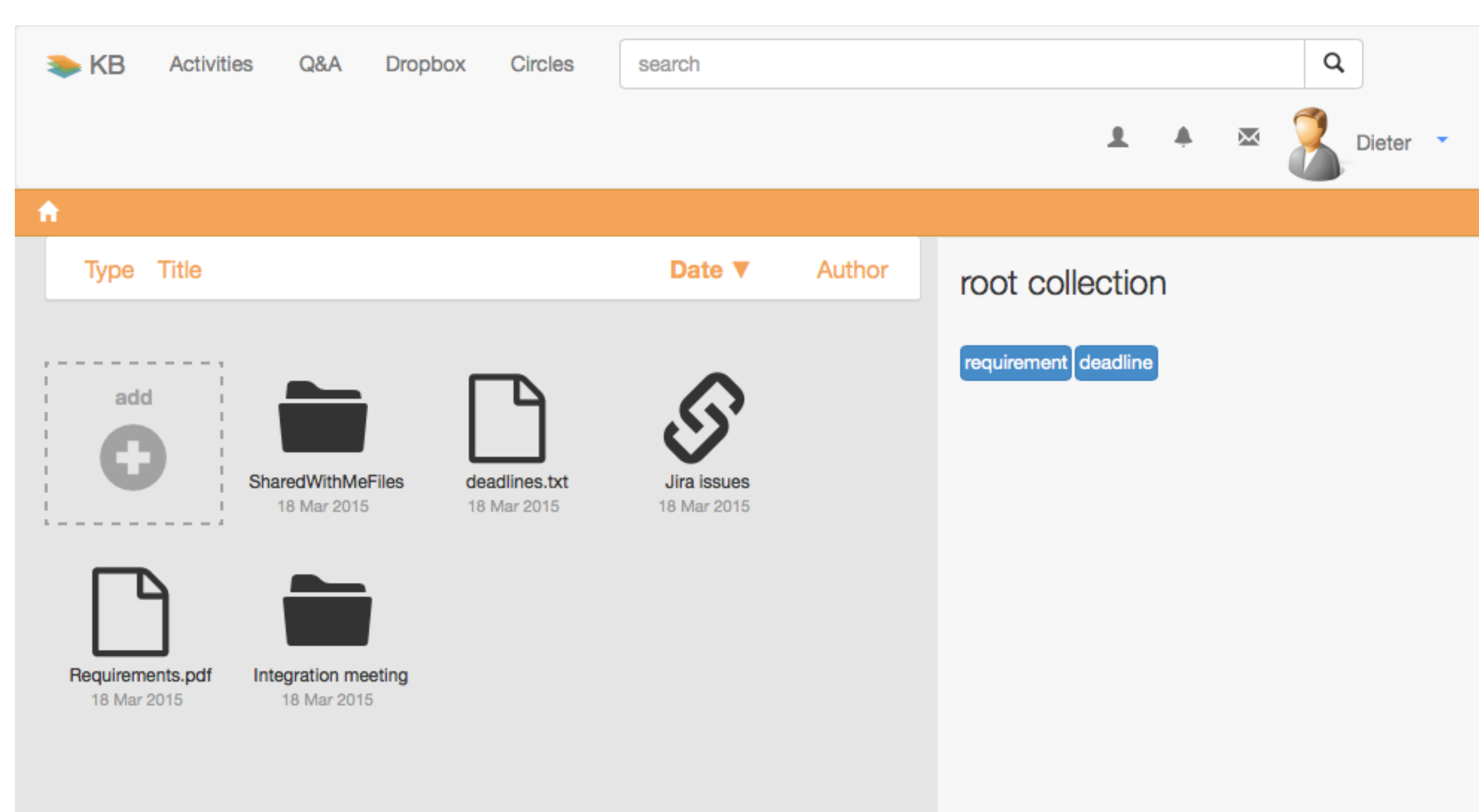


(a) KnowBrain resource overview interface (i.e., Dropbox)

(b) Social tagging interface & recommendations

[Online under: *https://github.com/learning-layers/KnowBrain*]

## 3LAYERS: CONTEXT-AWARE TAG RECOMMENDATIONS

$3Layers$ **builds on MINERVA2 [Hintzman, 1984], which is a formalization of how people make use of context cues (e.g., categories) to 1. search memory for contextually similar episodes (e.g., of other bookmarks with similar category combinations), and 2. access relevant items, such as tags that have frequently co-varied with these episodes.**
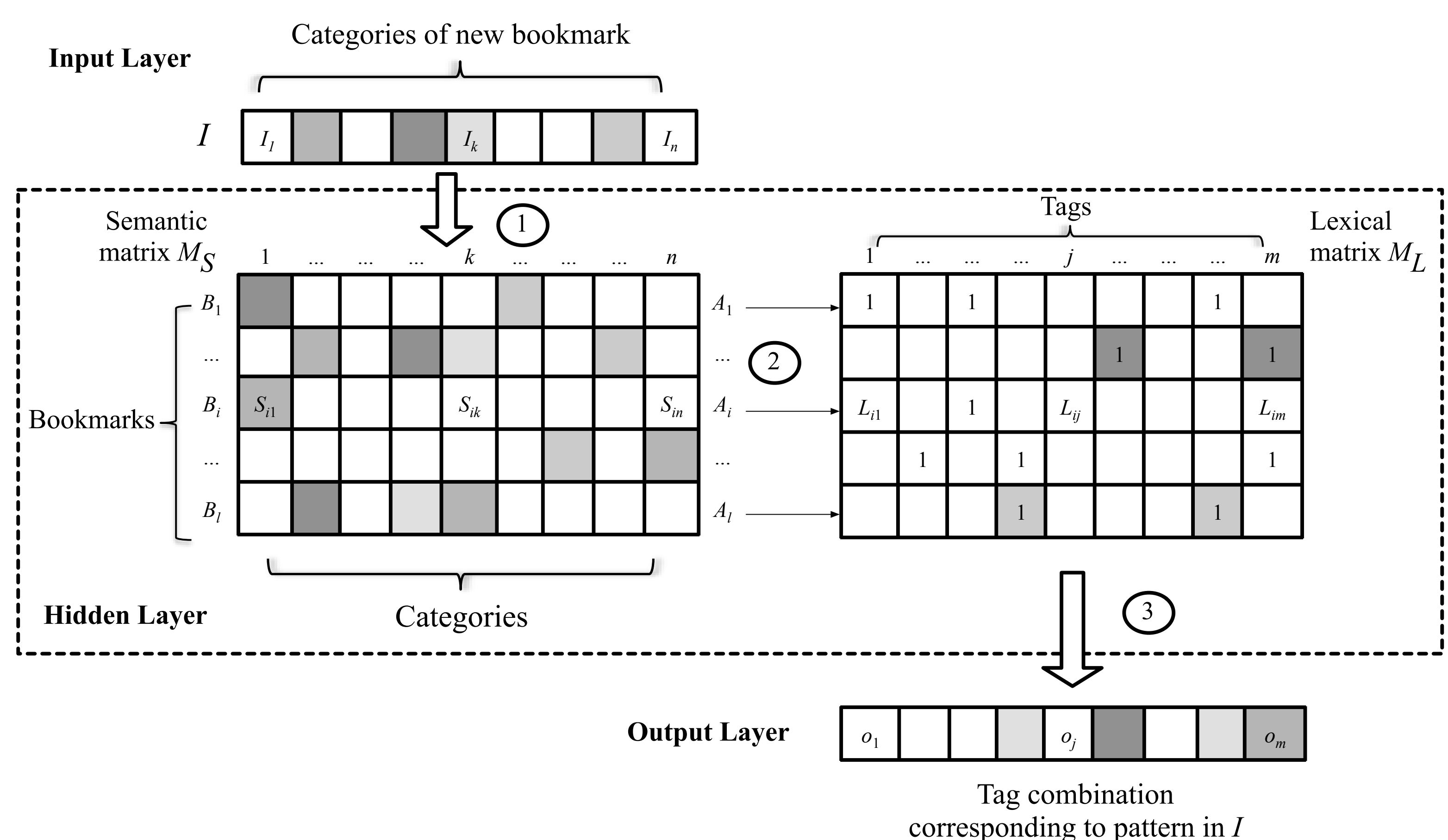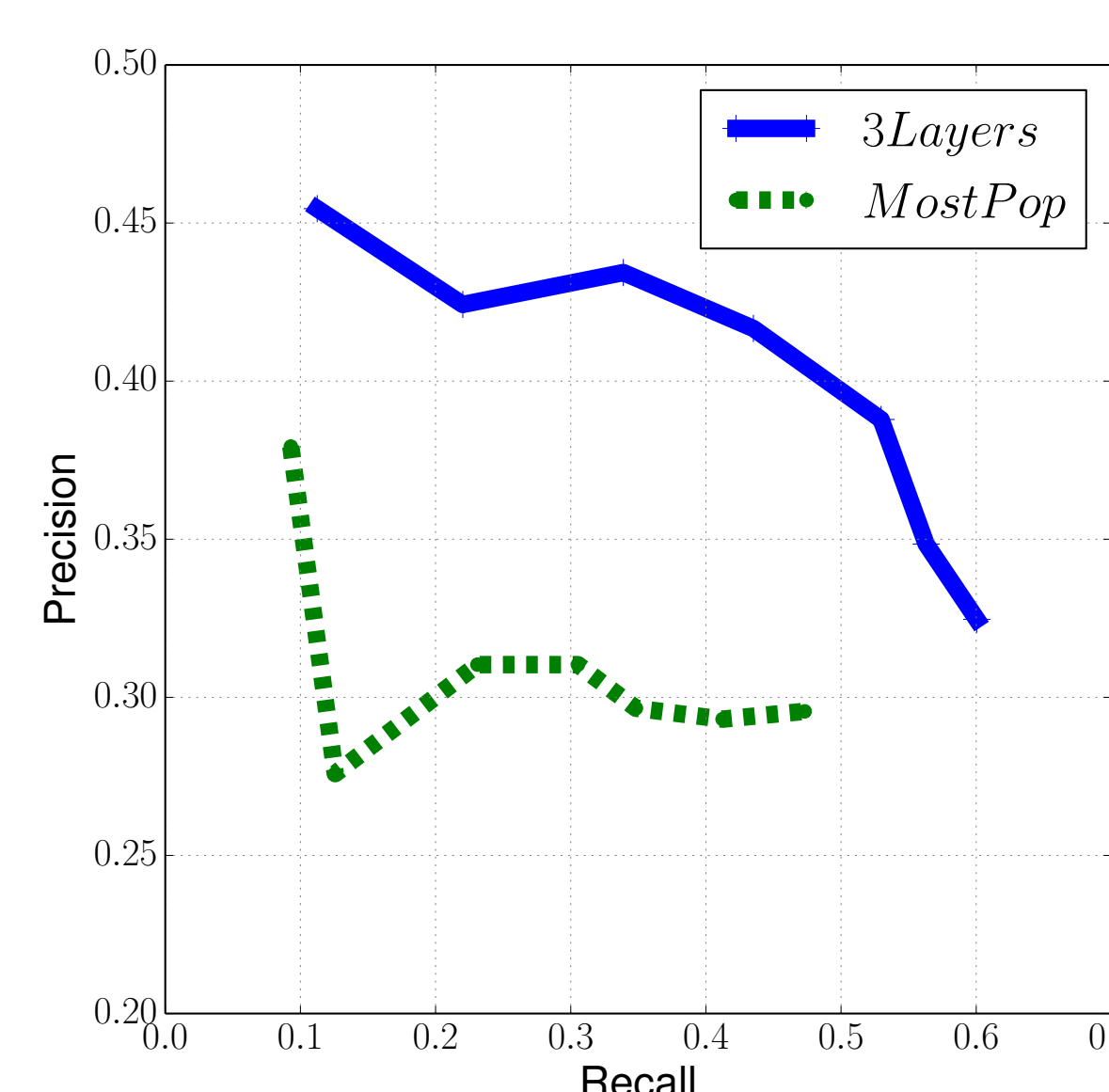


[Seitlinger, P., Kowald, D., Trattner, C., & Ley, T. (2013). Recommending tags with a model of human categorization. In *CIKM*. ACM.]
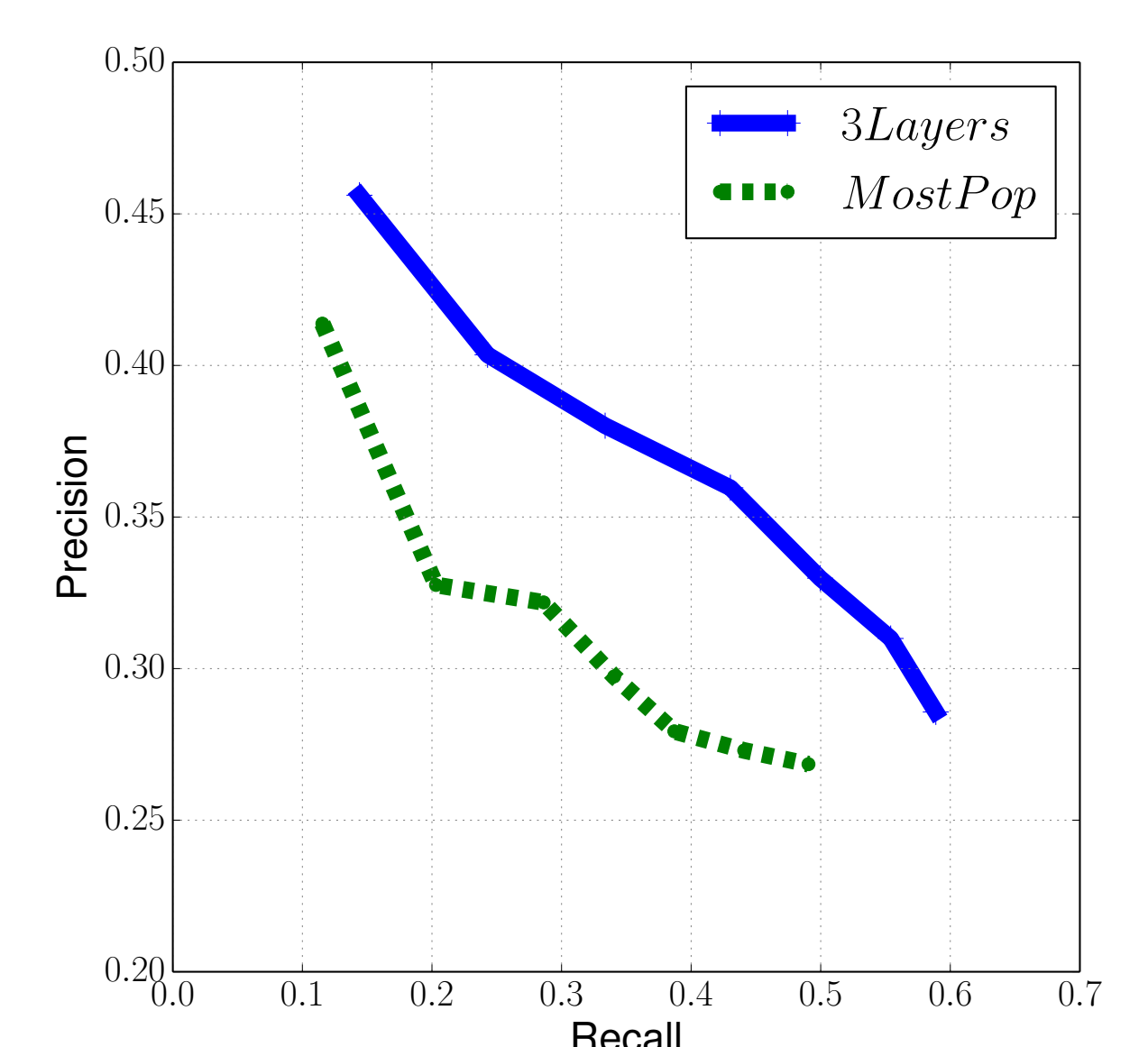
## RESULTS: USER ACCEPTANCE OF TAG RECOMMENDATIONS

**In line with our hypothesis, there is a significant difference between $3Layers$ and $MostPop$ in the collaborative setting ($p < 0.05$) but no difference in the individual one.**
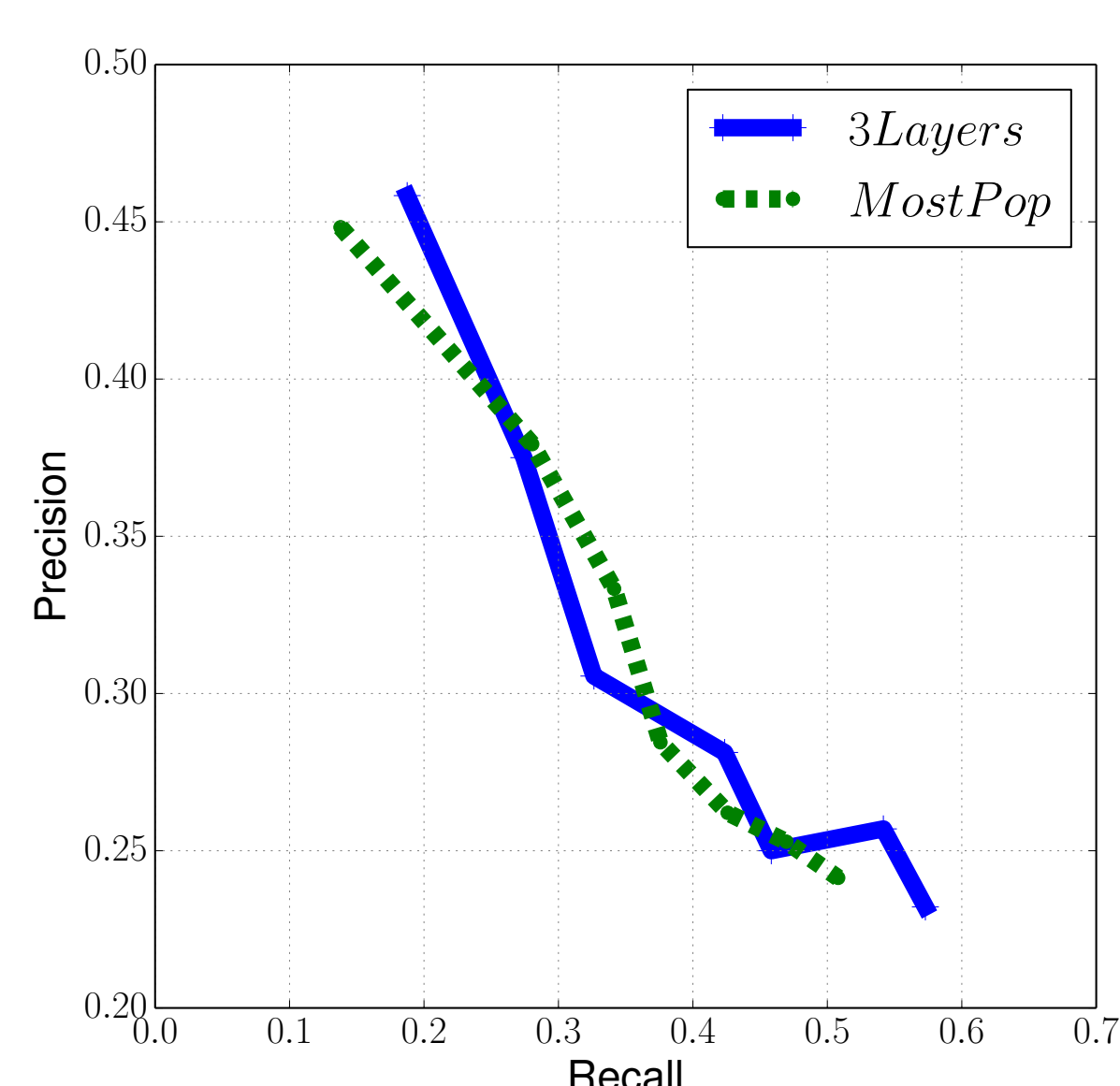


(a) Individual tagging setting

(b) Collaborative tagging setting

(c) Full dataset

[Kowald, D., Seitlinger, P., Ley, T., & Lex, E. (2018). The Impact of Semantic Context Cues on the User Acceptance of Tag Recommendations: An Online Study. In *WWW Companion*. ACM.]