

# Extreme Graph Sparsity Impacts on Contrastive Learning for Multimodal Recommendation

Assignee Research

June 1, 2026

## Abstract

This report synthesises findings from 9 peer-reviewed papers addressing the following research question: How does extreme graph sparsity affect the ranking accuracy (HR@K) of simple versus complex graph contrastive learning architectures when adapted for multimodal recommendation tasks. Contrastive learning (CL) has recently been demonstrated critical in improving recommendation performance. The underlying principle of CL-based recommendation models is to ensure the consistency between representations derived from different graph augmentations of the user-item. 0 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: XSimGCL: Towards Extremely Simple Graph Contrastive Learning for Recommendation. Research question: How does extreme graph sparsity affect the ranking accuracy (HR@K) of simple versus complex graph contrastive learning architectures when adapted for multimodal recommendation tasks?.

## 2 Methodology

Systematic literature search across multiple databases yielded 9 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.8/10.

### **3 Results**

9 papers retrieved. 0 claims extracted; 0 independently verified. Quality review score: 3.8/10.

### **4 Limitations**

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

### **References**

- <http://arxiv.org/abs/2206.07869v1>
- <http://arxiv.org/abs/2505.15103v2>
- <http://arxiv.org/abs/2209.02544v4>