

**The Evolution of Social Creativity: Integrating LLMs into Collaborative Ideation Processes**

Recent research reveals how the creation of new ideas through social interaction is being transformed by the integration of Large Language Models (LLMs). This emerging field sits at the intersection of creativity studies, social psychology, and artificial intelligence, exploring how human creative processes can be enhanced, augmented, or potentially hindered by AI collaboration.

**The Fundamental Role of Social Interaction in Creativity**

Contemporary research has firmly established that creativity flourishes in social contexts, challenging earlier views of creativity as primarily an individual endeavor. Social interaction provides critical scaffolding for creative processes through multiple mechanisms.

**Neurological Foundations of Group Creativity**

Groundbreaking research using functional near-infrared spectroscopy (fNIRS) has revealed the neurological underpinnings of social creativity. Scientists examining brain activity during group brainstorming sessions discovered that creativity-focused discussions induced "interbrain coupling" in key regions[[1]](#fn1). Specifically, coupling in the dorsolateral prefrontal cortex (DLPFC), associated with cognitive flexibility, positively predicted group creativity, while coupling in the inferior frontal gyrus (IFG), linked to imitation, negatively predicted creative outcomes[[1]](#fn1). This suggests that social creativity benefits from shared neural states that promote flexibility rather than conformity.

**Social Support as a Creativity Catalyst**

Experimental evidence demonstrates that perceived social support directly enhances creativity. In controlled studies, participants exposed to social support priming demonstrated higher scores across multiple creativity measures, including fluency, flexibility, and originality in divergent thinking tasks[[2]](#fn2). This relationship is theoretically supported by self-determination theory, which posits that autonomy, competence, and relatedness are fundamental psychological needs that, when fulfilled through social support, foster creativity[[2]](#fn2).

**Structured Social Ideation Methods**

Brainstorming, developed by Alex Osborn in the late 1930s, remains a foundational method for enhancing creativity through group interaction[[3]](#fn3). Modern research confirms that effective brainstorming consists of two distinct phases: a divergent phase that prioritizes quantity and novelty of ideas, and a convergent phase focused on evaluation and selection[[3]](#fn3). The suspension of critical judgment during the divergent phase has proven particularly crucial for allowing creative ideas to emerge and develop[[3]](#fn3).

**LLMs as Creative Collaborators: Current Research**

The integration of LLMs into creative processes represents a significant evolution in how we approach ideation and problem-solving.

**LLMs as Ideation Engines**

Research demonstrates that LLMs can function effectively as "ideation engines," generating vast quantities of ideas more rapidly than traditional human-only brainstorming[[4]](#fn4). These models leverage their training on diverse datasets to provide unique insights across domains, often bridging knowledge gaps and facilitating cross-disciplinary connections that might otherwise remain unexplored[[4]](#fn4). For example, the Ideacue tool developed by XLSCOUT leverages LLMs to aid inventors in the ideation process, allowing users to combine machine-suggested ideas with their own to enhance overall creativity[[4]](#fn4).

**Empirical Evidence of LLM-Enhanced Creativity**

Studies comparing ChatGPT-assisted problem solving with traditional methods found that using ChatGPT increased creativity in everyday tasks like generating gift ideas or repurposing unused items[[5]](#fn5). ChatGPT's primary strength appears to be bringing together diverse concepts coherently, resulting in ideas that are incrementally rather than radically novel[[5]](#fn5). In comparative analyses, ideas generated with LLM assistance were rated as more creative than those produced using Google search or unassisted human brainstorming[[5]](#fn5).

**Quantifying Collective AI Creativity**

Recent research has quantified the creative output of LLMs relative to human performance, finding that when questioned 10 times, an LLM's collective creativity is equivalent to approximately 8-10 humans[[6]](#fn6). As response quantity increases, researchers observed that two additional LLM responses roughly equal one extra human contributor[[6]](#fn6). These findings challenge the conventional wisdom that creative tasks remain a uniquely human strength in the workplace[[6]](#fn6).

**Frameworks for Human-AI Co-Creativity**

Researchers have developed several frameworks to structure and enhance the collaborative creative process between humans and LLMs.

**The Four Levels of Human-AI Interaction**

A comprehensive framework examining human-AI co-creativity identifies four progressively integrated levels of interaction: Digital Pen (AI as a tool), AI Task Specialist (AI for specific subtasks), AI Assistant (AI as an active collaborator), and AI Co-Creator (AI as a partner with agency)[[7]](#fn7). This model emphasizes that while early digital tools primarily facilitated creativity, modern generative AI systems actively contribute, demonstrating autonomous creative capabilities[[7]](#fn7).

**Collaborative Group-AI Framework**

A promising approach for enhancing ideation integrates LLMs into group creative processes without replacing human input[[8]](#fn8). This two-phase framework supports both divergent thinking (idea generation) and convergent thinking (evaluation and selection)[[8]](#fn8). In the divergence stage, group members first generate their own ideas, then prompt an LLM to enhance their initial set. In the convergence stage, the LLM assists in evaluating ideas and further developing selected concepts[[8]](#fn8).

**The LLM Discussion Framework**

The LLM Discussion framework addresses limitations in single-LLM creativity by emulating human collective creativity processes[[9]](#fn9)[[10]](#fn10). This three-phase discussion framework facilitates vigorous and diverging idea exchanges between multiple LLM instances, each assigned distinct roles to combat homogeneity[[9]](#fn9). Experimental evaluation shows this approach outperforms both single-LLM approaches and existing multi-LLM frameworks across various creativity metrics[[9]](#fn9).

**Challenges and Considerations in Human-LLM Creative Collaboration**

Despite promising advances, research has identified several challenges and considerations in human-LLM creative collaboration.

**Cognitive Biases in Human-AI Collaboration**

Studies investigating cognitive biases in human-AI collaboration reveal that anthropomorphism significantly affects how humans interact with AI systems[[11]](#fn11). Interestingly, research shows that subjects were less likely to agree with AI recommendations when the AI displayed human-like characteristics[[11]](#fn11). These findings highlight the need for tailored approaches to AI design in creative collaboration contexts[[11]](#fn11).

**Potential Impacts on Human Creative Abilities**

Emerging research raises concerns about how repeated LLM use might affect human creativity over time[[12]](#fn12). Some studies suggest that overreliance on these models may impair the ability to think creatively independently, resulting in less varied and innovative ideas even when the tool is no longer in use[[12]](#fn12). This creates a tension between the short-term creative enhancement LLMs provide and potential long-term effects on creative cognition[[12]](#fn12).

**LLM Creative Limitations**

Assessment frameworks for LLM creativity reveal specific strengths and weaknesses in these systems[[13]](#fn13). While LLMs generally excel in elaboration (developing ideas in detail), they fall short in originality compared to human creators[[13]](#fn13). Research also indicates that prompt design and role-play settings significantly influence LLM creative output, suggesting that human guidance remains essential for optimal results[[13]](#fn13).

**Conclusion**

Research on the creation of new ideas through social interaction, now including LLMs, reveals a rapidly evolving landscape where traditional creativity theories meet artificial intelligence capabilities. The evidence suggests that LLMs can meaningfully enhance creative processes when integrated thoughtfully into social ideation contexts. However, optimal implementation requires careful attention to framework design, cognitive biases, and potential long-term impacts on human creative abilities.

Future research will likely focus on developing more sophisticated models of human-AI co-creativity, refining frameworks for effective collaboration, and addressing concerns about creative dependency. As these technologies continue to advance, the goal remains enhancing human creativity rather than replacing it, leveraging the unique strengths of both human social interaction and artificial intelligence to generate truly novel and valuable ideas.

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