

Supplemental Information

Unlocking Creativity with Artificial Intelligence: Field and Experimental Evidence on the Goldilocks (Curvilinear) Effect of Human–AI Collaboration

Summary of Pre-Registration Deviations

Study 1

No pre-registration.

Study 2

Our pre-registration plan for Study 2 specifies the use of two trained judges to rate the creativity of all proposals, and two additional coders to code the psychological processes of problem restructuring and knowledge diversity. While these findings show statistically significant patterns, we adopted an advanced approach by leveraging crowdsourced ratings from the public and report findings based on the crowdsourcing method in the manuscript.

In addition, we did not pre-register AI-rated creativity but decided to explore this outcome and include this indicator when analyzing our findings.

Study 3

Our pre-registered analyses include controls for testing the curvilinear effect of human–AI collaboration on creativity. For transparency, we also report results without controls in the manuscript.

Additionally, we included a secondary creativity measure (creativity of work), which was not highlighted in our pre-registration, alongside our primary creativity measure for robustness.

Study 1 and Study 2 Research Materials

Please read the following instructions for the task carefully.

Low Human–AI Collaboration Condition (Random Assignment; Coding = -1)

Mike is a student in an entrepreneurship class, and his assignment is to generate as much money as possible in **three hours** with a **seed fund of \$10**. He needs your help to come up with creative ideas and strategies to make the most profit. Your task is to brainstorm with him and help him develop a winning idea that he can present to the class.

During the brainstorming phase, **you are required to write down all the ideas that come to mind in the space provided on the next page**. For clarity, Mike can use the \$10 seed fund to purchase materials or resources that he needs based on your idea. The goal is to maximize the profit in the given time frame, and Mike will present the results and lessons learned in the next class.

After brainstorming, **you need to choose your most creative idea and write an email to Mike explaining the idea in detail**. This will give Mike a better understanding of your idea and help him prepare for his presentation.

For this task, you will have access to **ChatGPT**, an artificial intelligence (AI) that can engage in natural language conversations with users and respond to a wide range of topics, from general knowledge to specific queries, to assist you. However, please limit your use of ChatGPT to **no more than 1 time** (each question or request counts as one time).

You have **15 minutes** to complete this task, which involves brainstorming ideas and selecting the most creative one to write an email to Mike, explaining the details. Remember to think creatively and have fun with this assignment!

Moderate Human–AI Collaboration Condition (*Random Assignment; Coding = 0*)

Mike is a student in an entrepreneurship class, and his assignment is to generate as much money as possible in **three hours** with a **seed fund of \$10**. He needs your help to come up with creative ideas and strategies to make the most profit. Your task is to brainstorm with him and help him develop a winning idea that he can present to the class.

During the brainstorming phase, **you are required to write down all the ideas that come to mind in the space provided on the next page**. For clarity, Mike can use the \$10 seed fund to purchase materials or resources that he needs based on your idea. The goal is to maximize the profit in the given time frame, and Mike will present the results and lessons learned in the next class.

After brainstorming, **you need to choose your most creative idea and write an email to Mike explaining the idea in detail**. This will give Mike a better understanding of your idea and help him prepare for his presentation.

For this task, you will have access to **ChatGPT**, an artificial intelligence (AI) that can engage in natural language conversations with users and respond to a wide range of topics, from general knowledge to specific queries, to assist you. To complete the task, please use ChatGPT **between 4 to 6 times** (each question or request counts as one time).

You have **15 minutes** to complete this task, which involves brainstorming ideas and selecting the most creative one to write an email to Mike, explaining the details. Remember to think creatively and have fun with this assignment!

High Human–AI Collaboration Condition (Random Assignment; Coding = 1)

Mike is a student in an entrepreneurship class, and his assignment is to generate as much money as possible in **three hours** with a **seed fund of \$10**. He needs your help to come up with creative ideas and strategies to make the most profit. Your task is to brainstorm with him and help him develop a winning idea that he can present to the class.

During the brainstorming phase, **you are required to write down all the ideas that come to mind in the space provided on the next page**. For clarity, Mike can use the \$10 seed fund to purchase materials or resources that he needs based on your idea. The goal is to maximize the profit in the given time frame, and Mike will present the results and lessons learned in the next class.

After brainstorming, **you need to choose your most creative idea and write an email to Mike explaining the idea in detail**. This will give Mike a better understanding of your idea and help him prepare for his presentation.

For this task, you will have access to **ChatGPT**, an artificial intelligence (AI) that can engage in natural language conversations with users and respond to a wide range of topics, from general knowledge to specific queries, to assist you. To complete the task, please use ChatGPT **at least 9 times** (each question or request counts as one time).

You have **15 minutes** to complete this task, which involves brainstorming ideas and selecting the most creative one to write an email to Mike, explaining the details. Remember to think creatively and have fun with this assignment!

Response Page

(For the Measures of Problem Restructuring and Knowledge Diversity)

During this brainstorming phase, please write down all the ideas that come to mind in the space below.

(For the Measures of Human-Rated Creativity, Business Value, and AI-Rated Creativity)

In this final proposal phase, please select your most creative idea (only one) and write an email to Mike explaining the idea in detail.

Study 1 Measures

Manipulation Check: ChatGPT Use

How many times did you use ChatGPT during this task? (Please be honest and there is no penalty)

___ time(s) (each question or request counts as one time)

Competence (Not Reported in Manuscript)

Please indicate the extent to which you agree with the following statements: (1 = Strongly disagree, 7 = Strongly agree)

When working with ChatGPT during the task...

1. I really mastered this task.
2. I felt competent in completing this task.
3. I was good at the things I did in this task.
4. I had the feeling that I could even accomplish other more difficult tasks.

Autonomy (Not Reported in Manuscript)

Please indicate the extent to which you agree with the following statements: (1 = Strongly disagree, 7 = Strongly agree)

When working with ChatGPT during the task...

1. I felt like I could make a lot of inputs to deciding how this task got done.
2. I felt pressured while completing this task with the help of ChatGPT. (reverse coded)
3. When I was completing this task, I had to do what I was told by ChatGPT. (reverse coded)
4. I felt like I could pretty much be myself in this task.
5. There was not much opportunity for me to decide for myself how to go about this task. (reverse coded)
6. I was free to use my ideas and opinions in this task.
7. My feelings were taken into consideration in this task.

Collective Psychological Ownership (Not Reported in Manuscript)

Please indicate the extent to which you agree with the following statements: (1 = Strongly disagree, 7 = Strongly agree)

When working with ChatGPT during the task...

1. ChatGPT and I really had ownership of the idea.
2. The idea we were working on really belonged to ChatGPT and me.
3. I thought I could speak for both ChatGPT and myself when I said, “this is our idea.”
4. I felt like both ChatGPT and I owned a piece of the idea.

Self-Rated Creativity (Not Reported in Manuscript)

Based on your honest assessment, how creative do you think the final idea you presented to Mike is? (1 = Not at all creative, 7 = Extremely creative)

Note. By creative, we mean ideas that are based on two key components: novelty AND utility. In other words, creative ideas are both *novel AND useful*.

Task Interest

Please indicate the extent to which you agree with the following statements: (1 = Strongly disagree, 7 = Strongly agree)

1. I enjoyed doing this task very much.
2. This task was fun to do.

Satisfaction (Not Reported in Manuscript)

Overall, how satisfied were you with this task? (1 = Extremely dissatisfied, 7 = Extremely satisfied)

ChatGPT Experience

How long have you been using ChatGPT in your personal life?

___ weeks

ChatGPT Familiarity

Overall, how familiar are you with ChatGPT based on your personal/past experience (e.g., in your personal life) using it? (1 = Not at all familiar, 7 = Extremely familiar)

Demographics

Gender

What is your gender?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

Age

What is your age (in years)? ____

Ethnicity

What is your ethnicity?

- White / Caucasian
- Hispanic / Latino
- Black / African American
- Indigenous Canadians / American Indian / Alaskan Native
- Asian / Pacific Islander
- Other, please specify: ____
- Prefer not to say

Work Experience

How many years of work experience do you have? ____

Supplemental Analyses in Study 1

Control Variables: Familiarity with ChatGPT, ChatGPT Experience, and Task Interest

To assess robustness, we controlled for potential confounds in our experiment, and the results held across three measures of creativity: general (human-rated) creativity, business value, and AI-rated creativity. See below for one-way ANCOVA results.

1. DV: General Creativity

One-Way ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	12.79	5.00	2.56	1.63	.16	.06
Intercept	47.69	1.00	47.69	30.35	<.001	.19
Familiarity	.14	1.00	.14	.09	.77	.00
ChatGPTExperience	.00	1.00	.00	.00	.99	2.12E-6
Interest	1.84	1.00	1.84	1.17	.28	.01
Condition	10.41	2.00	5.20	3.31	.04	.05
Error	209.00	133.00	1.57			
Total	2056.50	139.00				
Corrected Total	221.79	138.00				

R Squared = .058 (Adjusted R Squared = .022)

2. DV: Business Value

One-Way ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	44.82	5.00	8.96	2.24	.05	.08
Intercept	66.88	1.00	66.88	16.72	<.001	.11
Familiarity	6.50	1.00	6.50	1.62	.20	.01
ChatGPTExperience	1.99	1.00	1.99	.50	.48	.00
Interest	3.35	1.00	3.35	.84	.36	.01
Condition	28.95	2.00	14.47	3.62	.03	.05
Error	532.15	133.00	4.00			
Total	4032.00	139.00				
Corrected Total	576.97	138.00				

R Squared = .078 (Adjusted R Squared = .043)

3. AI-Rated Creativity

One-Way ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	8.11	5.00	1.62	1.13	.35	.04
Intercept	70.46	1.00	70.46	49.28	<.001	.27
Familiarity	.01	1.00	.01	.01	.93	5.06E-5
ChatGPTEExperience	.08	1.00	.08	.06	.81	.00
Interest	.01	1.00	.01	.00	.95	2.81E-5
Condition	7.97	2.00	3.98	2.79	.07	.04
Error	190.18	133.00	1.43			
Total	2033.00	139.00				
Corrected Total	198.29	138.00				

R Squared = .041 (Adjusted R Squared = .005)

Curvilinear (Mediating) Effects of Other Psychological Outcomes: Sense of Competence, Sense of Autonomy, and Collective Psychological Ownership

As noted in Study 1 Measures above, to explore additional psychological benefits of human–AI collaboration (which may also support creative process), we included three primary self-report measures described below for transparency: competence, autonomy, and collective psychological ownership.

Sense of Competence. Effective collaboration between humans and AI has the potential to improve task efficiency, which can contribute to individuals’ perception of competence in their creative abilities. We measured feelings of competence during the task with four items (e.g., “When working with ChatGPT during the task, I was good at the things I did in this task”) (Van den Broeck et al., 2010) on a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*; $\alpha = .91$).

Sense of Autonomy. Alongside competence under self-determination theory (Ryan & Deci, 2000), one’s autonomy may also be affected by collaboration with AI. While a high level of interaction with AI may potentially threaten users’ autonomy by limiting their freedom to make decisions, it is also important to consider that individuals with a low level of human–AI collaboration may not necessarily reap the autonomy benefit. This is because in psychology excessive freedom can sometimes lead to paradoxical demotivating effects (Iyengar & Lepper, 2000). To capture sense of autonomy, participants responded to seven items (e.g., “When working with ChatGPT during the task, I felt like I could make a lot of inputs to deciding how this task got done”) (Van den Broeck et al., 2010) using a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*; $\alpha = .73$).

Collective Psychological Ownership. Finally, we also sought to explore the unique consequence concerning collective psychological ownership within AI context, which is defined

as feelings of joint possession over the idea in this creative task (Gray et al., 2020). We investigated whether moderate human–AI collaboration eventuates in higher levels of collective psychological ownership, such that participants believed, for example, “When working with ChatGPT during the task, I felt like both ChatGPT and I owned a piece of the idea.” They rated four items (Gray et al., 2020) on a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*; $\alpha = .96$).

Results of Competence, Autonomy, and Collective Psychological Ownership

Main Effects. We observed a significant effect of human–AI collaboration on felt competence, $F(2, 136) = 4.62, p = .011, \eta^2 = .06$, in particular, a curvilinear effect: participants in the moderate human–AI collaboration treatment felt more competent about this creative task ($M = 5.68, SD = .93$) as opposed to those in the low ($M = 5.06, SD = .99$), $t(136) = 2.97, p = .004, d = .62$, and high human–AI collaboration treatments ($M = 5.26, SD = 1.07$), $t(136) = 2.04, p = .043, d = .42$. There was no significant difference between low and high human–AI collaboration.

Contrary to our expectations, one-way ANOVA of treatments on feelings of autonomy was non-significant, $F(2, 136) = 2.03, p = .14, \eta^2 = .03$, suggesting no differences in terms of autonomy between treatments.

Predicting collective psychological ownership, there were significant differences by condition, $F(2, 136) = 4.05, p = .020, \eta^2 = .06$. Planned comparisons illustrated that, in the moderate human–AI collaboration condition participants felt a higher joint possession with ChatGPT of the generated idea ($M = 4.56, SD = 1.44$) compared to both low ($M = 3.76, SD = 1.57$), $t(136) = 2.60, p = .010, d = .54$, and high human–AI collaboration ($M = 3.86, SD = 1.41$), $t(136) = 2.30, p = .023, d = .48$. The results of these three outcomes are summarized in Table S1.

Table S1*Means and Standard Deviations by Experimental Condition in Study 1*

<i>Source of Measures</i>		<i>Phase 2 Business Proposal</i>		<i>Phase 1 Brainstorming Ideas</i>		<i>Survey After the Two-Phased Task</i>		
Treatment		Creative Outcomes		Cognitive (Mediating) Processes		Other Psychological Outcomes		
Human–AI collaboration	Human-rated creativity	Business value	AI-rated creativity	Problem restructuring	Knowledge diversity	Sense of competence	Sense of autonomy	Collective psychological ownership
Low (<i>n</i> = 46)	3.49 (1.25)	4.60 (1.89)	3.33 (1.17)	.41 (.27)	4.30 (1.30)	5.06 (.99)	5.02 (.88)	3.76 (1.57)
Moderate (<i>n</i> = 46)	4.02 (1.21)	5.67 (2.04)	3.91 (1.26)	.43 (.29)	5.10 (1.00)	5.68 (.93)	5.18 (.82)	4.56 (1.44)
High (<i>n</i> = 47)	3.39 (1.28)	4.69 (2.07)	3.66 (1.11)	.44 (.29)	4.57 (1.07)	5.26 (1.07)	4.82 (.91)	3.86 (1.41)

Note. Standard deviations in parentheses.

Mediation Effects. We further examined whether sense of competence, sense of autonomy, and collective psychological ownership mediated the curvilinear effect of human–AI collaboration and creativity. The results showed that both sense of competence (instantaneous indirect effects: $\theta_{low\ human-AI\ collaboration} = .34$, 95% CI [.11, .73]; $\theta_{moderate\ human-AI\ collaboration} = .03$, 95% CI [-.03, .12]; $\theta_{high\ human-AI\ collaboration} = -.28$, 95% CI [-.64, -.07]) and collective psychological ownership explained the curvilinear relationship (instantaneous indirect effects: $\theta_{low\ human-AI\ collaboration} = .19$, 95% CI [.01, .54]; $\theta_{moderate\ human-AI\ collaboration} = .01$, 95% CI [-.03, .06]; $\theta_{high\ human-AI\ collaboration} = -.18$, 95% CI [-.50, -.002]), whereas sense of autonomy did not (instantaneous indirect effects: $\theta_{low\ human-AI\ collaboration} = .08$, 95% CI [-.02, .36]; $\theta_{moderate\ human-AI\ collaboration} = -.02$, 95% CI [-.09, .01]; $\theta_{high\ human-AI\ collaboration} = -.11$, 95% CI [-.43, .01]).

For a more thorough investigation, we tested which of the five mediator candidates, including two cognitive processes (problem restructuring and knowledge diversity) and three psychological outcomes (sense of competence, sense of autonomy, and collective psychological ownership), could account for the curvilinear relationship between human–AI collaboration and creativity above and beyond others. Therefore, we conducted mediation analyses controlling for all alternative mediators in the regression model. Only knowledge diversity as the cognitive process (instantaneous indirect effects: $\theta_{low\ human-AI\ collaboration} = .18$, 95% CI [.01, .54]; $\theta_{moderate\ human-AI\ collaboration} = .03$, 95% CI [-.01, .11]; $\theta_{high\ human-AI\ collaboration} = -.20$, 95% CI [-.54, -.02]) and sense of competence as the psychological benefit mediated the curvilinear creativity effect (instantaneous indirect effects: $\theta_{low\ human-AI\ collaboration} = .19$, 95% CI [.01, .54]; $\theta_{moderate\ human-AI\ collaboration} = .01$, 95% CI [-.03, .06]; $\theta_{high\ human-AI\ collaboration} = -.12$, 95% CI [-.43, .02]).

Discussion. We conclude that from low to moderate collaboration with AI, additional human–AI collaboration enhances creativity by increasing both knowledge diversity and felt

competence. However, from moderate to high collaboration with AI, additional human–AI collaboration impairs creativity by decreasing knowledge diversity only (without necessarily reducing felt competence). Surprisingly, we did not observe an autonomy advantage (Iyengar & Lepper, 2000) according to the (ideal) usage of AI. This might be because creative tasks in general require individuals to actively engage in critical thinking and autonomously manage the entire process to some extent.

Study 2 Measures

Manipulation Check: ChatGPT Use

How many times did you use ChatGPT during this task? (Please be honest and there is no penalty)

___ time(s) (each question or request counts as one time)

Self-Rated Creativity (Not Reported in Manuscript)

Based on your honest assessment, how creative do you think the final idea you presented to Mike is? (1 = Not at all creative, 7 = Extremely creative)

Note. By creative, we mean ideas that are based on two key components: novelty AND utility. In other words, creative ideas are both *novel AND useful*.

Task Interest

Please indicate the extent to which you agree with the following statements: (1 = Strongly disagree, 7 = Strongly agree)

1. I enjoyed doing this task very much.
2. This task was fun to do.

ChatGPT Experience

How long have you been using ChatGPT in your personal life?

___ weeks

ChatGPT Familiarity

Overall, how familiar are you with ChatGPT based on your personal/past experience (e.g., in your personal life) using it? (1 = Not at all familiar, 7 = Extremely familiar)

Trust in ChatGPT

Overall, how much do you trust ChatGPT based on your personal/past experience (e.g., in your personal life) using it? (1 = Not at all, 7 = Extremely)

ChatGPT Version (Not Reported in Manuscript)

Which version of ChatGPT do you use?

- ChatGPT-3.5 (free version)
- ChatGPT-4 (paid version)

Demographics (Gender, Age, Ethnicity, Work Experience)

Supplemental Analyses in Study 2

Original Measures of Creativity, Problem Restructuring, and Knowledge Diversity

For transparency, we describe our original approach in the pre-registered plan for assessing creativity, problem restructuring, and knowledge diversity.

Creativity. As in Study 1, a new set of two independent judges rated the creative proposal (1 = *Not at all creative*, 7 = *Extremely creative*) and achieved satisfactory inter-rater reliability (ICC = .77). We then averaged the two ratings.

Problem Restructuring. We hired a separate pair of two coders to calculate the percentage of brainstormed ideas that restructured the problem, averaging the two codings given that the inter-rater reliability was high (ICC = .80).

Knowledge Diversity. The same two coders used for problem restructuring evaluated the level of diversity exhibited by the brainstormed ideas (1 = *Not at all diverse*, 7 = *Extremely diverse*). The two scores were averaged (ICC = .71).

Results based on Original Measures

Creativity. One-way ANOVA results indicated a significant effect of human–AI collaboration on creativity, $F(2, 316) = 5.37, p = .005, \eta^2 = .03$. Planned comparisons revealed a curvilinear effect: proposals in the moderate human–AI collaboration were more creative ($M = 3.09, SD = 1.14$) than those in the low ($M = 2.62, SD = 1.14$), $t(316) = 3.02, p = .003$, Cohen's $d = .41$, and high human–AI collaboration conditions ($M = 2.68, SD = 1.15$), $t(316) = 2.60, p = .01, d = .36$.

Mediation of Problem Restructuring and Knowledge Diversity. No significant differences in problem restructuring during brainstorming between treatments were detected, $F(2, 316) = .45, p = .64, \eta^2 = .003$. In contrast, we observed a significant (curvilinear) effect of

treatments on knowledge diversity in brainstormed ideas, $F(2, 316) = 6.09, p = .003, \eta^2 = .04$, such that participants' brainstormed ideas were more knowledge-diverse in the moderate human–AI collaboration treatment ($M = 4.40, SD = .93$) as opposed to in low ($M = 3.92, SD = 1.09$), $t(316) = 3.26, p = .001, d = .45$, and high human–AI collaboration ($M = 4.00, SD = 1.21$), $t(316) = 2.71, p = .007, d = .37$.

To test for curvilinear mediation effects, we computed mediation analyses (Hayes & Preacher, 2010). The instantaneous indirect effect of human–AI collaboration on creativity through problem restructuring was non-significant for low ($\theta = -.006, 95\% \text{ CI } [-.08, .02]$), moderate ($\theta = -.001, 95\% \text{ CI } [-.02, .01]$), and high human–AI collaboration ($\theta = .004, 95\% \text{ CI } [-.02, .07]$), showing that problem restructuring did not mediate the curvilinear creativity relationship. Conversely, the instantaneous indirect effect through knowledge diversity was positive at low human–AI collaboration ($\theta = .21, 95\% \text{ CI } [.09, .42]$), not significant at moderate human–AI collaboration ($\theta = .01, 95\% \text{ CI } [-.03, .05]$), and negative at high human–AI collaboration ($\theta = -.20, 95\% \text{ CI } [-.41, -.06]$). These findings suggest that from a low to moderate degree of human–AI collaboration, more collaboration with AI increased creativity via facilitating knowledge diversity; yet, from a moderate to high degree of collaboration with AI, more human–AI collaboration decreased creativity via hindering knowledge diversity. Similar to Study 1 results, knowledge diversity during brainstorming accounted for the AI Goldilocks effect.

Control Variables: Familiarity with ChatGPT, ChatGPT Experience, Trust in ChatGPT, ChatGPT Version, and Task Interest

To assess robustness, we controlled for potential confounds in our replication experiment, and the results held. See below for one-way ANCOVA results.

DV: Creativity (Two Judges)

One-Way ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	15.77	7.00	2.25	1.71	.11	.04
Intercept	67.40	1.00	67.40	51.13	<.001	.14
Familiarity	.03	1.00	.03	.02	.88	6.84E-5
ChatGPTExperience	1.04	1.00	1.04	.79	.37	.00
Trust	.19	1.00	.19	.14	.71	.00
ChatGPT_Version	.48	1.00	.48	.36	.55	.00
Interest	.05	1.00	.05	.04	.85	.00
Condition	13.67	2.00	6.83	5.18	.01	.03
Error	409.98	311.00	1.32			
Total	2920.00	319.00				
Corrected Total	425.76	318.00				

R Squared = .037 (Adjusted R Squared = .015)

DV: Creativity (Crowdsourced)

One-Way ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	10.85	6.00	1.81	3.45	.00	.06
Intercept	109.02	1.00	109.02	207.69	<.001	.40
Familiarity	.42	1.00	.42	.80	.37	.00
ChatGPTExperience	.48	1.00	.48	.91	.34	.00
Trust	.00	1.00	.00	.00	.97	5.66E-6
ChatGPT_Version	3.45	1.00	3.45	6.58	.01	.02
Condition	4.21	2.00	2.11	4.01	.02	.03
Error	163.77	312.00	.52			

Total	5698.80	319.00				
Corrected Total	174.62	318.00				

R Squared = .062 (Adjusted R Squared = .044)

Study 3 Measures

Employee Survey (Time 1)

Intrinsic Motivation

Why are you motivated to do your work? (1 = Strongly disagree, 7 = Strongly agree)

I do this job because...

1. I enjoy the work itself.
2. I find the work engaging.
3. I find the work interesting.

Creative Requirement

Please indicate the extent to which you agree with the following statement: (1 = Strongly disagree, 7 = Strongly agree)

My job involves solving problems that have no obvious correct answer.

Human–AI Collaboration

We are interested in your experience with technology at work, in particular, *artificial intelligence* (i.e., a specific type of modern software equipped with autonomous learning, reasoning, problem-solving, decision-making capability, and/or the ability to generate new content, including but not limited to machine learning, ChatGPT, Stable Diffusion, DALL-E, and Notion AI).

Please indicate the extent to which you agree with the following statements: (1 = Strongly disagree, 7 = Strongly agree)

In my job...

1. I use artificial intelligence to carry out most of my job functions.
2. I spend most of my time working with artificial intelligence.
3. I work with artificial intelligence in making major work decisions.

Trust in AI (Not Reported in Manuscript)

Please indicate the extent to which you agree with the following statements: (1 = Strongly disagree, 7 = Strongly agree)

In my job...

1. When I complete my work, I feel I can depend on artificial intelligence.
2. I can always rely on artificial intelligence for my work.
3. I feel I can count on artificial intelligence when doing my work.
4. If I had a challenging problem, I would want to use artificial intelligence.

Conscientiousness and Openness to Experience

Here are a number of personality traits that may or may not apply to you. Please indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other: (1 = Strongly disagree, 7 = Strongly agree)

I see myself as...

Conscientiousness

1. Dependable, self-disciplined
2. Disorganized, careless (reverse coded)

Openness to Experience

3. Open to new experiences, complex
4. Conventional, uncreative (reverse coded)

Demographics (Gender, Age, Ethnicity, Work Experience, Tenure)

Supervisor Survey (Time 2 i.e., 1 week later)**Creativity**

Please indicate how often the following statements characterize [this employee]. (1 = Not at all, 6 = Very often)

1. Demonstrates originality in his/her work.
2. Takes risks in terms of producing new ideas in doing job.
3. Finds new uses for existing methods or equipment.
4. Solves problems that had caused other's difficulty.
5. Tries out new ideas and approaches to problems.
6. Identifies opportunities for new products/processes.
7. Generates novel, but operable work-related ideas.
8. Serves as a good role model for creativity.
9. Generates ideas revolutionary to our field.

(Follow-Up) Creativity of Work (Not Reported in Manuscript)

Please answer the following question based on your honest assessment of [this employee]'s work: (1 = Not at all, 7 = Extremely)

How ORIGINAL and PRACTICAL is [this employee]'s work?

Original and practical work refers to developing ideas, methods, or products that are both totally unique and especially useful to the organization

Supplemental Analyses in Study 3

Additional Control Variable: Trust in AI

In Study 3, we also collected *trust in AI* (McKnight et al., 2002) for exploratory purposes as it can greatly influence how individuals approach and use AI at work (Glikson & Woolley, 2020), which might affect human creative processes. Since this variable was highly positively correlated with the degree of human–AI collaboration ($r = .79, p < .001$; Table S3), we deliberately did not include it as control in our main analyses in the manuscript in order to minimize the potential issue of multicollinearity and avoid overcontrolling for a specific effect. Otherwise, “the addition of control variables can distort the effect of a variable of theoretical interest” (Kalnins, 2018, p. 2375). In the spirit of full transparency, following Spector (2021) we conducted supplementary analyses and report the results with the addition of this control below:

1. In Step 1, we included five control variables, including intrinsic motivation, creative requirement, conscientiousness, openness to experience, and trust in AI.
2. In Step 2, we added the linear term of human–AI collaboration as a predictor.
3. In Step 3, we included both the linear term and quadratic term of human–AI collaboration as predictors.

As displayed in Table S2, in our full model both the linear ($b = .30, SE = .14, 95\% \text{ CI } [.03, .57], p = .03$) and quadratic terms of human–AI collaboration were (marginally) significant predictors of creativity ($b = -.03, SE = .02, 95\% \text{ CI } [-.07, .002], p = .07$). The results of both significant linear and quadratic terms indicated a non-symmetrical inverted-U-shaped relationship between human–AI collaboration and creativity.

Table S2*Hierarchical Regression (with Trust in AI as Additional Control) in Study 3*

Predictor	DV: Creativity								
	Step 1: Control Variables			Step 2: Adding Human–AI Collaboration			Step 3: Curvilinear Effect of Human–AI Collaboration		
	<i>b</i> (SE)	β	<i>t</i> (182)	<i>b</i> (SE)	β	<i>t</i> (181)	<i>b</i> (SE)	β	<i>t</i> (180)
Intrinsic Motivation	.18 (.04)	.25	4.30***	.17 (.04)	.24	4.02***	.18 (.04)	.25	4.22***
Creative Requirement	.27 (.03)	.45	8.27***	.27 (.03)	.44	8.11***	.27 (.03)	.44	8.10***
Conscientiousness	-.0001 (.05)	-.0001	-.002	-.003 (.05)	-.01	-.06	.01 (.05)	.01	.13
Openness to Experience	.17 (.05)	.21	3.75***	.18 (.05)	.22	3.89***	.17 (.05)	.21	3.84***
Trust in AI	.13 (.03)	.24	4.27***	.09 (.05)	.16	1.82 [†]	.07 (.05)	.12	1.40
Human–AI Collaboration				.06 (.05)	.11	1.23	.30 (.14)	.54	2.16*
Human–AI Collaboration ²							-.03 (.02)	-.42	-1.85 [†]
Intercept	.58 (.38)		1.52	.62 (.38)		1.60	.30 (.42)		.71

Note. *N* = 188.*b* = Unstandardized coefficients (standard error in parentheses) β = Standardized coefficients*t* = *t*-statistic (df)[†] *p* < .10, * *p* < .05, ** *p* < .01, *** *p* < .001

Additional Dependent Variable: (Follow-Up) Creativity of Work

For robustness and to confirm that our original measure of creativity did capture employees' creativity in their job, we followed up with their supervisor for an additional indicator evaluating the creativity of their work (rather than the focal person). Based on the formal definition that creativity involves both novelty and usefulness components (Amabile, 1982), we asked supervisors to complete a one-item scale, "How ORIGINAL and PRACTICAL is [this employee]'s work?" (Oldham & Cummings, 1996) while presenting the definition. The two measures, creativity and the creativity of work, were highly positively correlated ($r = .71, p < .001$; Table S3), meaning that both are reliable and valid indicators for human/employee creativity. We proceeded with hierarchical regression analyses using this alternative indicator of creativity as the dependent variable:

1. In Step 1, we included four control variables, including intrinsic motivation, creative requirement, conscientiousness, and openness to experience.
2. In Step 2, we added the linear term of human–AI collaboration as a predictor for the creativity of work.
3. In Step 3, we included both the linear term and quadratic term of human–AI collaboration as predictors for the creativity of work.

As presented in Table S4, in our full model both the linear ($b = .87, SE = .23, 95\% \text{ CI } [.42, 1.32], p < .001$) and quadratic terms of human–AI collaboration were significant predictors of creativity ($b = -.09, SE = .03, 95\% \text{ CI } [-.16, -.03], p = .004$). The results of significant linear and quadratic terms revealed a non-symmetrical inverted-U-shaped relationship between human–AI collaboration and the creativity of work.

To probe comprehensiveness, we repeated the analytical procedure with the inclusion of trust in AI as an additional control. As shown in Table S5, the statistical results held, such that the quadratic term of human–AI collaboration was significant ($b = -.08$, $SE = .03$, 95% CI $[-.15, -.02]$, $p = .01$).

Table S3

Means, Standard Deviations, and Correlations (with Creativity of Work as Additional DV and Trust in AI as Additional Control) in Study 3

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
Independent Variable									
1. Human–AI Collaboration	2.83	1.77							
Dependent Variable									
2. Creativity (supervisor-rated)	4.17	.98	.36***						
3. Creativity of Work (supervisor-rated)	4.68	1.69	.37***	.71***					
Control Variables									
4. Intrinsic Motivation for Job	5.31	1.35	.33***	.44***	.44***				
5. Creative Requirement for Job	4.69	1.60	.15*	.54***	.46***	.18*			
6. Conscientiousness Personality	5.83	1.05	-.02	.06	.09	.18*	-.02		
7. Openness to Experience Personality	5.31	1.19	-.07	.31***	.24***	.21**	.13	.22**	
8. Trust in AI	3.51	1.76	.79***	.35***	.37***	.28***	.11	-.06	-.03

Note. $N = 188$.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table S4*Hierarchical Regression Predicting Creativity of Work in Study 3*

Predictor	DV: Creativity of Work								
	Step 1: Control Variables			Step 2: Adding Human–AI Collaboration			Step 3: Curvilinear Effect of Human–AI Collaboration		
	<i>b</i> (SE)	β	<i>t</i> (183)	<i>b</i> (SE)	β	<i>t</i> (182)	<i>b</i> (SE)	β	<i>t</i> (181)
Intrinsic Motivation	.43 (.08)	.35	5.57***	.33 (.08)	.26	4.12***	.35 (.08)	.28	4.45***
Creative Requirement	.41 (.06)	.39	6.37***	.38 (.06)	.36	6.12***	.37 (.06)	.35	6.17***
Conscientiousness	.03 (.10)	.02	.26	.04 (.09)	.03	.46	.08 (.09)	.05	.82
Openness to Experience	.16 (.09)	.12	1.88	.22 (.09)	.15	2.55*	.20 (.08)	.15	2.45*
Human–AI Collaboration				.23 (.06)	.24	4.00***	.87 (.23)	.91	3.81***
Human–AI Collaboration ²							-.09 (.03)	-.69	-2.88**
Intercept	-.55 (.73)		-.75	-.89 (.71)		-1.26	-1.87 (.77)		-2.42*

Note. *N* = 188.*b* = Unstandardized coefficients (standard error in parentheses) β = Standardized coefficients*t* = *t*-statistic (df)* *p* < .05, ** *p* < .01, *** *p* < .001

Table S5*Hierarchical Regression Predicting Creativity of Work (with Trust in AI as Additional Control)**in Study 3*

Predictor	DV: Creativity of Work								
	Step 1: Control Variables			Step 2: Adding Human–AI Collaboration			Step 3: Curvilinear Effect of Human–AI Collaboration		
	<i>b</i> (SE)	β	<i>t</i> (182)	<i>b</i> (SE)	β	<i>t</i> (181)	<i>b</i> (SE)	β	<i>t</i> (180)
Intrinsic Motivation	.33 (.08)	.26	4.28***	.32 (.08)	.25	4.04***	.34 (.08)	.27	4.34***
Creative Requirement	.39 (.06)	.37	6.38***	.38 (.06)	.36	6.25***	.38 (.06)	.36	6.25***
Conscientiousness	.07 (.09)	.04	.73	.06 (.09)	.04	.68	.09 (.09)	.06	.95
Openness to Experience	.20 (.08)	.14	2.34*	.21 (.08)	.15	2.46*	.20 (.08)	.14	2.39*
Trust in AI	.25 (.06)	.26	4.04***	.19 (.09)	.19	2.11*	.14 (.09)	.14	1.56
Human–AI Collaboration				.09 (.09)	.09	.99	.68 (.25)	.72	2.69**
Human–AI Collaboration ²							-.08 (.03)	-.61	-2.49*
Intercept	-1.22 (.71)		-1.72	-1.18 (.71)		-1.65	-1.97 (.77)		-2.55*

Note. *N* = 188.*b* = Unstandardized coefficients (standard error in parentheses) β = Standardized coefficients*t* = *t*-statistic (df)* *p* < .05, ** *p* < .01, *** *p* < .001

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