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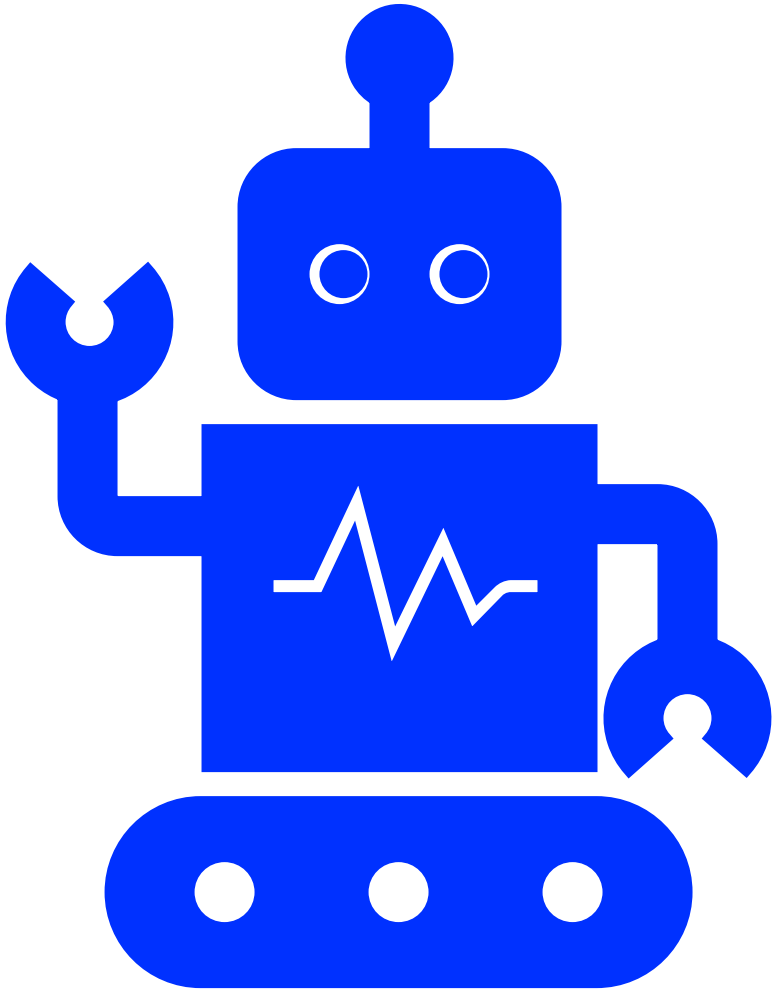
AI or Human Feedback?

Implications for Virtual Team Processes and Performance



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Background

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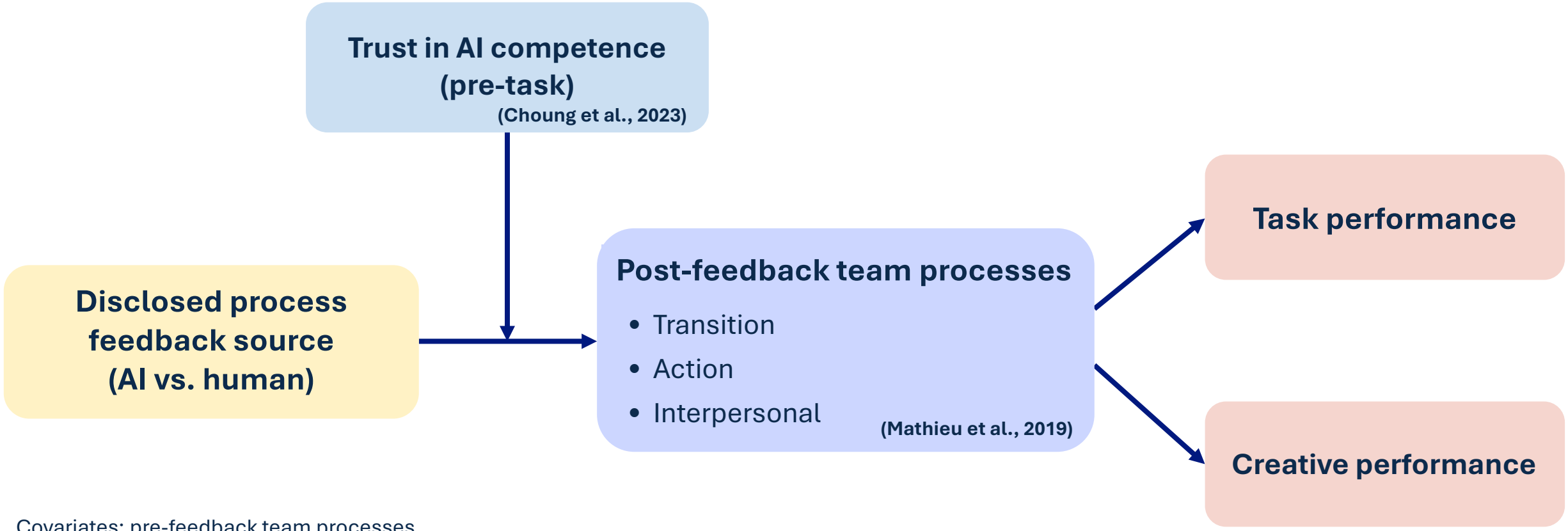
Virtual teamwork presents unique challenges	Technology-mediated collaboration can limit social cues and awareness of team functioning, making effective coordination more challenging (Hertel et al., 2005)
Team process feedback can address these challenges	Feedback on how teams collaborate can improve virtual team functioning and performance (Geister et al., 2006)
AI creates new opportunities	AI offers opportunities to provide feedback more efficiently and at scale (Tong et al., 2021), making it particularly relevant to technology-dependent virtual teams
Disclosed feedback source may matter	Disclosing feedback as AI- versus human-generated can influence recipients' responses, even when the underlying feedback is similar (Tong et al., 2021; Hein et al., 2024)
Limited evidence on disclosure effect in virtual teams	Little is known about whether attributing process feedback to AI versus a human affects virtual team processes and performance, or whether these effects depend on trust in AI (Gabelica et al., 2012; Glikson & Woolley, 2020)

Research model



Covariates: pre-feedback team processes

How might pre-existing trust in AI moderate feedback source effects?

	Prediction A: Algorithm aversion	**Prediction B: Algorithm appreciation**
Low trust in AI	Human-disclosed feedback more effective	No difference between feedback sources
High trust in AI	No difference between feedback sources	AI-disclosed feedback more effective
Proposed explanation	Low trust reduces acceptance of AI feedback; higher trust attenuates this disadvantage	High trust enhances acceptance of AI feedback, producing an AI advantage
Theoretical support	Dietvorst et al. (2015); Tong et al. (2021)	Logg et al. (2019); Glikson & Woolley (2020)

- Both predictions imply a positive feedback source * trust in AI interaction, but differ in whether increasing trust reduces a human feedback advantage or produces an AI feedback advantage
- Preregistered hypothesis was non-directional

Participants

166 participants across 60 virtual teams of 2–4 members

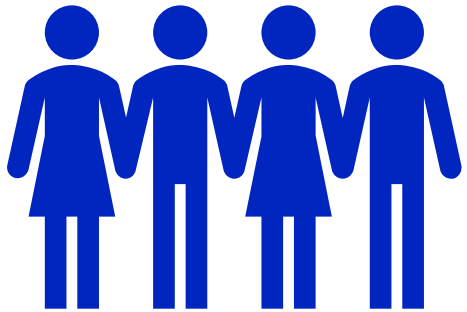
- 28 two-member teams
- 18 three-member teams
- 14 four-member teams

University of Western Australia students

- Undergraduate: *N* = 101 (41 teams); received course credit
- Postgraduate: *N* = 65 (19 teams); participated as part of a learning activity

Age: 17–51 years (*M* = 23.11, *SD* = 6.95)

Gender: 133 female, 32 male, 1 not reported



Research design

- Microsoft Teams meeting hosted by research team member
- Pre-task survey (demographics, trust in AI)
- Shared Google Doc containing instructions, to collaborate on
- First 15 minutes of teamwork
- Mid-task survey (pre-feedback team processes)
- Team process feedback (either human or AI-disclosed)
- Second 15 minutes of teamwork
- Post-task survey (post-feedback team processes)
- Externally rated task- and creative performance

Volunteer Drivers Needed!

Transport to Treatment Program

Cancer Council Western Australia

Make a Difference in Someone's Cancer Journey

Cancer Council WA is currently seeking caring and reliable volunteer drivers to join our **Transport to Treatment** service. Volunteers help cancer patients travel safely to and from Fiona Stanley Hospital for their treatment appointments.

This rewarding role gives you the opportunity to support members of your local community during a difficult time while building meaningful connections with regular passengers.

About the Role

As a volunteer driver, you will:

- Transport cancer patients from their homes to Fiona Stanley Hospital and back
- Provide friendly and supportive conversation during travel
- Help reduce stress and transport barriers for patients attending treatment
- Represent Cancer Council WA in a professional and compassionate manner

Volunteers must reside in the **Peel or Rockingham region** and hold a **valid driver's licence**.



Join Our Team

Become part of a compassionate volunteer network helping Western Australians access vital cancer treatment. Your time and support could make someone's journey a little easier.

What Our Volunteers Say

"Driving for the Transport to Treatment program has been one of the most rewarding experiences of my life. I've met wonderful people and formed genuine friendships with many of the patients I regularly drive." – Volunteer Driver

"My driver always made me feel comfortable and supported during a very stressful time. Knowing someone was there to help me get to treatment made a huge difference." – Transport to Treatment Patient



How to Apply

To express your interest, please submit:

- A brief expression of interest
- A **2-page resume**

Applications close **16/07/26**

Please send applications or enquiries to:

Phone: 08 6488 8888
Email: volunteer@cancercouncil.wa.au

Team level descriptive statistics and correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Feedback source	−0.02	0.50	—								
2. Trust in AI competence	3.00	0.41	−.06	—							
3. Pre-feedback transition	3.47	0.56	.02	.02	—						
4. Pre-feedback action	3.35	0.63	.01	.07	.69***	—					
5. Pre-feedback interpersonal	3.53	0.75	−.03	.12	.59***	.79***	—				
6. Post-feedback transition	3.77	0.52	.29*	.07	.62***	.47***	.46***	—			
7. Post-feedback action	3.88	0.49	.26*	.20	.63***	.70***	.63***	.71***	—		
8. Post-feedback interpersonal	4.04	0.54	.14	−.02	.56***	.59***	.68***	.71***	.72***	—	
9. Task performance	7.12	1.57	.23	−.07	.18	.11	.12	.23	.30*	.17	—
10. Creative performance	5.10	1.85	.30*	.03	.16	.12	.13	.23	.35**	.17	.60***

Note. N = 60 teams. Two-tailed Pearson correlations. Feedback source coded −0.5 = human and +0.5 = AI. Trust in AI and team processes were measured on a scale from 1 to 5. Performance was measured on a scale from 0 to 10. Team processes and trust in AI are team means. * $p < .05$, ** $p < .01$, *** $p < .001$.

Effects of feedback source, trust in AI competence, and their interaction on post-feedback team processes

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Predictor	Post-feedback transition *B* (*SE*)	*p*	Post-feedback action *B* (*SE*)	*p*	Post-feedback interpersonal *B* (*SE*)	*p*
Intercept	1.69 (0.60)	.007	1.72 (0.30)	<.001	1.86 (0.42)	<.001
Feedback source	0.30 (0.15)	.048	0.26 (0.09)	.004	0.16 (0.11)	.179
Trust in AI competence	0.02 (0.33)	.954	0.20 (0.11)	.088	−0.17 (0.21)	.409
Feedback source × Trust	−0.50 (0.69)	.472	0.02 (0.25)	.927	−0.53 (0.43)	.217
Pre-feedback transition	0.47 (0.27)	.089	0.24 (0.12)	.050	0.17 (0.18)	.342
Pre-feedback action	−0.01 (0.36)	.972	0.29 (0.16)	.063	0.02 (0.24)	.948
Pre-feedback interpersonal	0.14 (0.42)	.737	0.10 (0.15)	.507	0.44 (0.26)	.105
R^2	.52		.63		.57	
Model $F(6, 53)$	11.35		15.20		16.90	
Model *p*	<.001		<.001		<.001	

Note. $N = 60$ teams. Unstandardised regression coefficients (*B*) and HC4 heteroscedasticity-consistent standard errors (*SE*) are reported. Feedback source was coded −0.5 = human and +0.5 = AI. Trust in AI competence was mean-centred.

Effects of feedback source and post-feedback team processes on task and creative performance

Predictor	Task performance *B* (*SE*)	*p*	Creative performance *B* (*SE*)	*p*
Intercept	3.95 (2.82)	.167	1.33 (3.65)	.716
Feedback source	0.45 (0.41)	.281	0.78 (0.66)	.248
Post-feedback transition	−0.01 (0.82)	.991	−0.24 (1.69)	.886
Post-feedback action	1.22 (1.27)	.341	1.95 (2.50)	.439
Post-feedback interpersonal	−0.28 (0.75)	.711	−0.50 (1.27)	.697
Pre-feedback transition	0.29 (0.72)	.688	0.24 (1.45)	.867
Pre-feedback action	−0.61 (0.71)	.394	−0.80 (1.17)	.501
Pre-feedback interpersonal	0.19 (0.66)	.781	0.27 (1.35)	.842
R^2	.13		.20	
Model $F(7, 52)$	0.69		1.15	
Model *p*	.683		.347	

Note. $N = 60$ teams. Unstandardised regression coefficients (*B*) and HC4 heteroscedasticity-consistent standard errors (*SE*) are reported. Both models included the three pre-feedback team processes as covariates. Feedback source was coded −0.5 = human and +0.5 = AI.

Indices of moderated mediation through post-feedback team processes

Indirect pathway via	Index	Boot *SE*	95% bootstrap CI
Task performance			
Transition processes	0.005	0.37	[−0.96, 0.67]
Action processes	0.03	0.36	[−0.72, 0.81]
Interpersonal processes	0.15	0.39	[−0.67, 1.00]
Creative performance			
Transition processes	0.12	0.42	[−0.71, 1.10]
Action processes	0.04	0.43	[−0.81, 0.98]
Interpersonal processes	0.27	0.42	[−0.51, 1.17]

Note. N = 60 teams. Bootstrap standard errors and 95% percentile bootstrap confidence intervals are based on 5,000 bootstrap samples. All three pre-feedback team processes were included as covariates.

Complementary analysis

PROCESS analyses were conducted at the team level (*N* = 60), using aggregated team process ratings to test the hypothesised moderated mediation model

But… aggregation was not consistently supported: ICC(1) values passed, but within-team agreement and ICC(2) values fell below recommended criteria for several team process measures

Linear Mixed Models (LMMs) conducted as complementary analysis of feedback source effects on team processes, that accounted for the multilevel structure of the data, without relying on team level aggregation

- Retained individual level responses (*N* = 166), avoiding the loss of information associated with aggregating individual ratings to team means
- Accounted for nested data structure: Repeated measurements within individuals, with individuals nested within teams
- Examined changes over time: Testing whether pre- to post-feedback changes in team processes differed between the AI- and human-disclosed feedback conditions

Linear Mixed Models: Effects of time and feedback source on team processes

Team process	Time	Feedback source	Time × Feedback source
Transition	$F(1, 162.81) = 31.88$, $p < .001$	$F(1, 57.65) = 1.47$, $p = .230$	$F(1, 162.81) = 6.40$, $p = .012$
Action	$F(1, 162.21) = 96.03$, $p < .001$	$F(1, 56.50) = 0.77$, $p = .385$	$F(1, 162.21) = 7.35$, $p = .007$
Interpersonal	$F(1, 162.28) = 88.06$, $p < .001$	$F(1, 64.63) = 0.002$, $p = .963$	$F(1, 162.28) = 6.55$, $p = .011$

Note. Linear mixed models accounted for repeated measurements within individuals and the nesting of individuals within teams, using team-level random intercepts and an unstructured covariance matrix for repeated measurements.

Interaction plots using estimated marginal means

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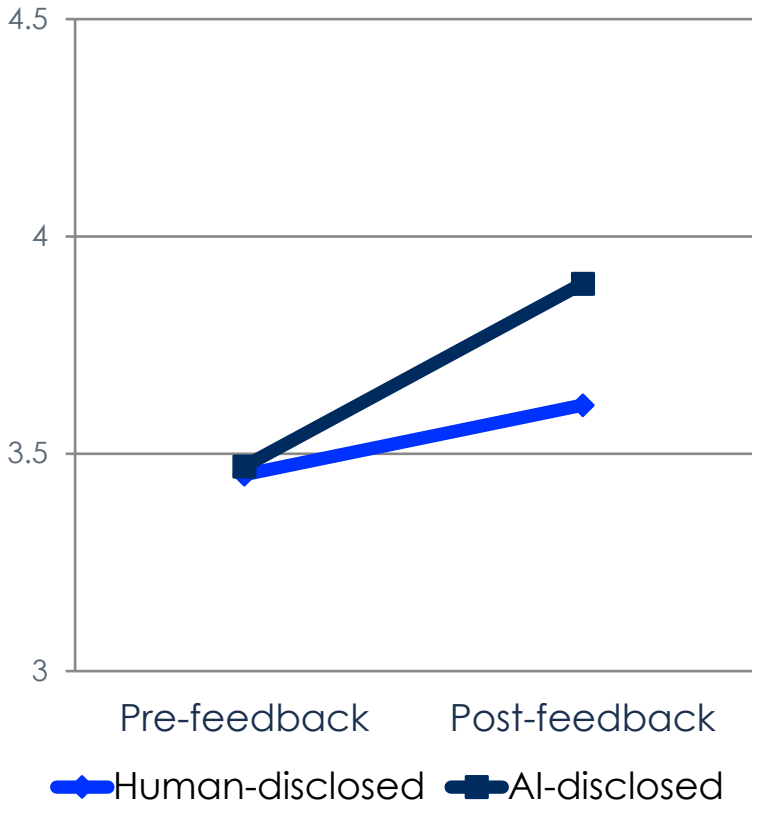
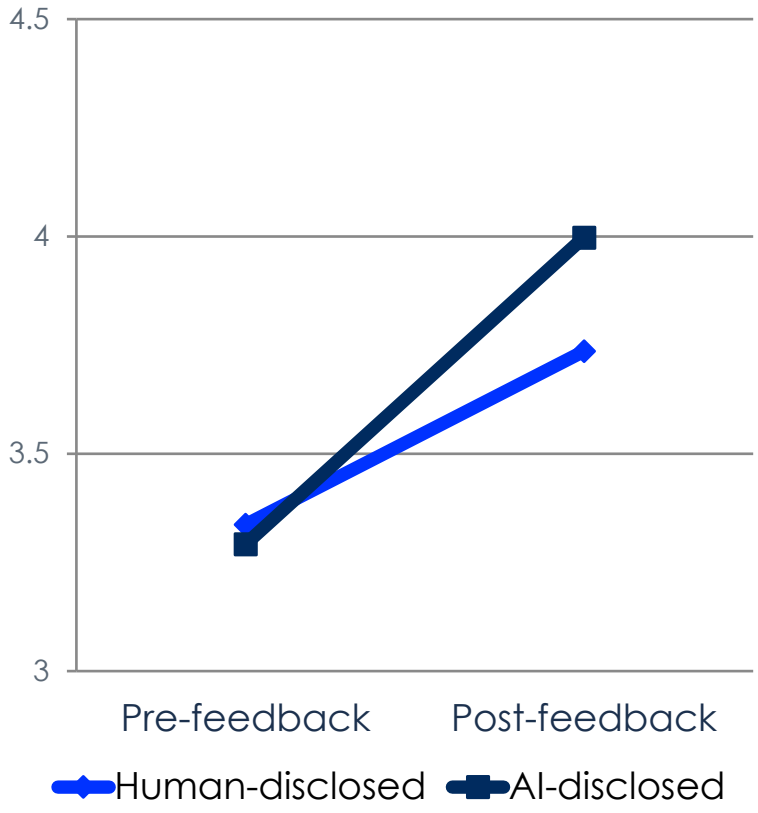
Transition processes



Source × time: F(1, 162.81) = 6.40, p = .012

Action processes



Source × time: F(1, 162.21) = 7.35, p = .007

Interpersonal processes



Source × time: F(1, 162.28) = 6.55, p = .011

Pre- and post-feedback team processes by disclosed feedback source

Team process	Human pre-feedback *M*	AI pre-feedback *M*	Pre-feedback comparison *p*	Human Δ*M*	AI Δ*M*	Post-feedback comparison *p*
Transition	3.45	3.47	.891	+0.16	+0.42	.033
Action	3.34	3.29	.760	+0.40	+0.71	.044
Interpersonal	3.55	3.41	.402	+0.40	+0.69	.281

Note. Values are estimated marginal means from linear mixed models. Δ*M* = post-feedback minus pre-feedback estimated marginal mean. The *p* values are Sidak-adjusted comparisons between human- and AI-disclosed feedback conditions at each time point.

The within-condition pre–post changes were statistically significant for all three processes in both conditions: transition (human $p = .027$; AI $p < .001$), action (both $p < .001$), and interpersonal (both $p < .001$).

Key findings

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- AI-disclosed feedback predicted higher post-feedback transition and action process ratings, controlling for pre-feedback levels
- Pre-existing trust in AI competence did not significantly moderate the effects of disclosed feedback source on team processes
- No evidence was found for conditional indirect effects of feedback source on task or creative performance through team processes
- AI-disclosed feedback was associated with higher creative performance ($r = .30$, $p = .018$), although the adjusted direct effect in PROCESS was nonsignificant
- All three team processes improved significantly in both conditions, with greater pre–post improvements in the AI-disclosed feedback condition
- No significant pre-feedback differences were found between conditions, while post-feedback ratings were significantly higher for transition and action processes in the AI-disclosed condition

Methodological considerations and explanations

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The sample of 60 teams may have provided insufficient statistical power to detect moderation and indirect effects

Limited variability in team level trust in AI (*M* = 3.00, *SD* = 0.41, range = 2.10–3.87) may have reduced sensitivity to moderation effects

Within-team agreement and ICC(2) values did not consistently meet the preregistered criteria for aggregation to the team level

Strong correlations between team processes may have obscured their unique contributions to performance

Implications

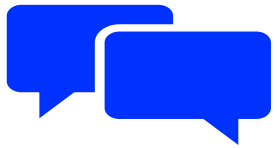


Theoretical

More favourable team processes following AI-disclosed feedback challenge expectations based on algorithm aversion

Improvements in team processes may require time to translate into performance gains, particularly in newly formed teams

Pre-existing trust in AI competence may be less influential in shaping responses to AI-disclosed feedback than anticipated



Practical

Organisations may be able to disclose AI involvement in team process feedback without undermining team functioning

AI-disclosed feedback may be particularly promising for supporting team planning, coordination and task execution

High pre-existing trust in AI may not be a prerequisite for teams to benefit from AI-disclosed process feedback

Future directions

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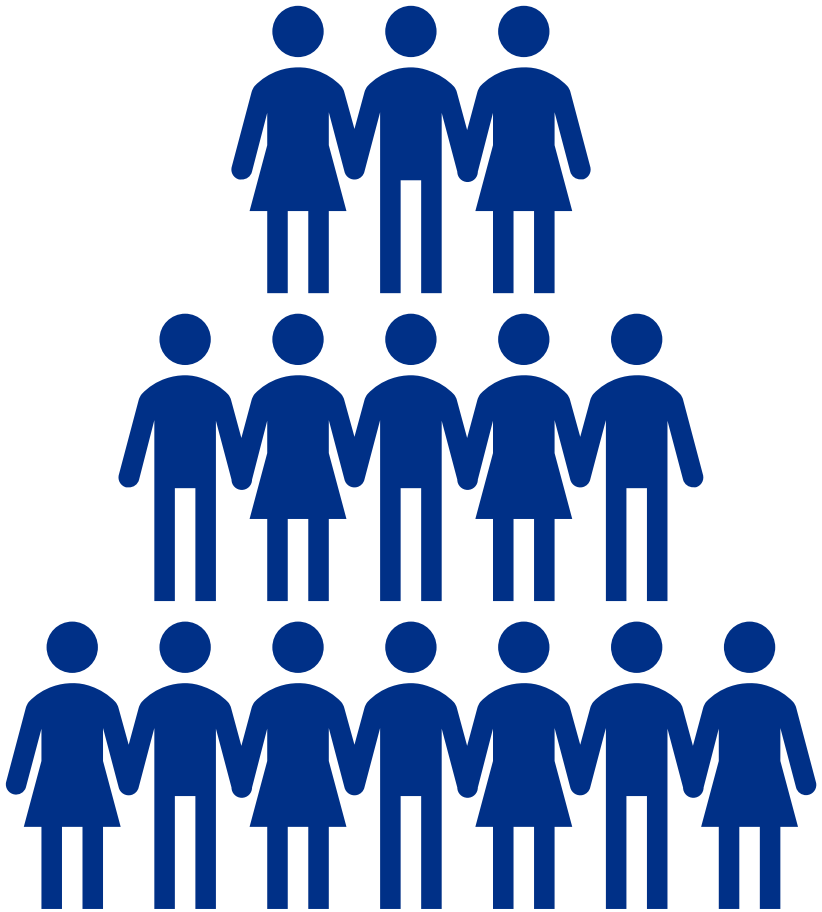
- Larger sample
- Multi-level analyses
- Long-term teams
- Longer collaboration
- Variation of time point at which feedback is given
- Study AI deployment effect (use real human generated feedback)
- Examine feedback acceptance
- Vary feedback valence
- Test with performance feedback
- Add a “No feedback” control group



Aggregation statistics

Within-team agreement for pre- and post-feedback team processes

Team process	Mean *rwg(j)*	Median *rwg(j)*	Teams with *rwg(j)* ≥ .70
Pre-feedback			
Transition processes	.539	.545	31.7%
Action processes	.521	.488	35.0%
Interpersonal processes	.474	.493	33.3%
Post-feedback			
Transition processes	.622	.643	46.7%
Action processes	.577	.632	41.7%
Interpersonal processes	.610	.677	48.3%

Note. *N* = 60 teams. *rwg*(j) assesses within-team agreement across the items comprising each team process measure. Values of .70 or higher were the preregistered criterion for acceptable agreement (LeBreton & Senter, 2008).

Intraclass correlation coefficients for pre- and post-feedback team processes

Team process	ICC(1)	ICC(2)
Pre-feedback		
Transition processes	.210	.421
Action processes	.246	.471
Interpersonal processes	.336	.580
Post-feedback		
Transition processes	.230	.452
Action processes	.185	.385
Interpersonal processes	.196	.403

Note. *N* = 60 teams. ICC(1) estimates the proportion of variance attributable to team membership; ICC(2) estimates the reliability of team mean scores. The preregistered criteria were ICC(1) ≥ .05 (Bliese, 2000) and ICC(2) ≥ .50 (Chen & Bliese, 2002).