

The Effect of Psychological Safety on Virtual Team Learning

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Agenda

- 1. Theoretical Foundations**
- 2. Research Questions**
- 3. Method**
- 4. Results**
- 5. Discussion**



1. Theoretical Foundations – Virtual team learning

- ▶▶ Virtual collaboration increasingly common
- ▶▶ Definition of virtuality or *degree* of virtuality not consistent, including physical distance among team members and/or departments, level and variety of technological support and/or national diversity
- ▶▶ In our study *degree* of virtuality depending on:
 - Geographical dispersion
 - Dependence on electronic communication media
- ▶▶ Challenges of virtual teams: Coordination and motivation losses
- ▶▶ Team learning/improvement



1. Theoretical Foundations – Virtual team learning

▶▶ Definition of team learning:

Conscious reflection of past activities within a work team, and the subsequent deduction of alternative strategies for following work

▶▶ Theoretical focus on two sub-constructs (Edmondson, 2002; West, 2000):

- **Team reflection** to gain insight
- **Team adaptation** to produce change

▶▶ Until now no empirical examination of two-dimensional structure

▶▶ Virtual team learning: Team reflection and adaptation through electronic communication media (Soule & Applegate, 2009)



1. Theoretical Foundations – Psychological safety

- ▶▶ Psychological safety: team climate variable in association with team learning
- ▶▶ Definition (Edmondson, 1999):
 - Shared belief of members that the team is safe for interpersonal risk taking
 - Confidence about absence of embarrassment, rejection, punishment for speaking up
- ▶▶ Difference to interpersonal trust
- ▶▶ Positive impact of psychological safety on team learning in conventional face-to-face teams
- ▶▶ Limited research in virtual context (Gibson & Gibbs, 2006)



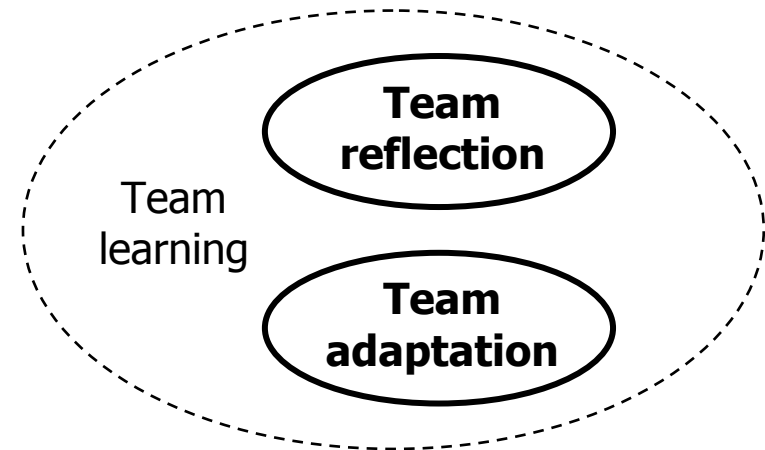
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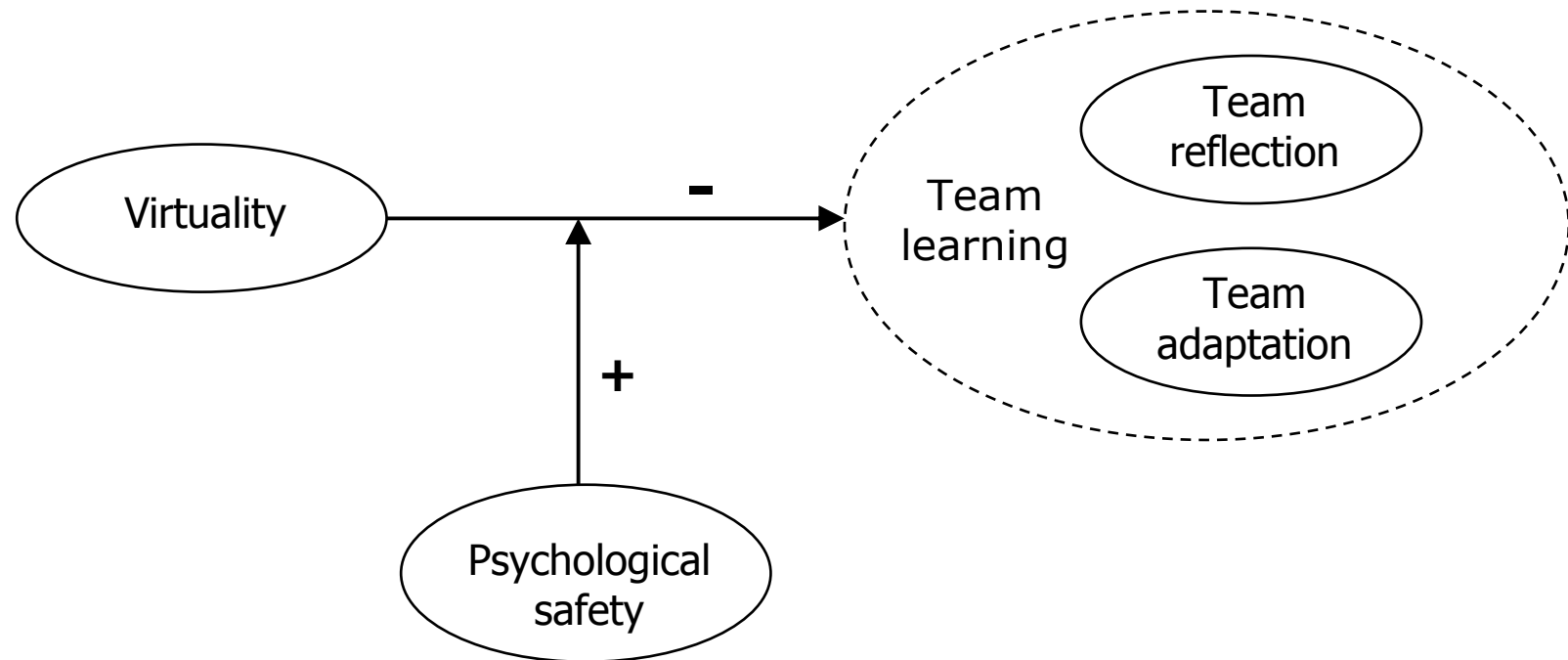
2. Research Questions

- ▶ Examination of team reflection and team adaptation as sub-constructs of team learning



2. Research Questions

- ▶ Examination of team reflection and team adaptation as sub-constructs of team learning
- ▶ Examination of psychological safety as moderator of virtuality – team learning link



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3. Method – Design

▶▶ Design:

- Policy-capturing approach (Karren & Woodard Barringer, 2002)
- Manipulation of degree of virtuality (low/medium/high) and psychological safety (low/medium/high)
- Fully crossed 3x3 design resulting in 9 scenarios

▶▶ Example (medium degree of virtuality/high degree of psychological safety):

When discussing work related tasks with your colleagues you often use electronic communication media (e.g., E-mail, telephone and/or videoconferencing) but also meet regularly face-to-face within a week. You are convinced that you and your colleagues can express criticism and can speak openly, as you do not fear rejection, negative assessment or other devaluation of your person by the team.



3. Method – Sample and Variables

▶▶ Sample:

- 68 participants (68 x 9 scenarios: $n = 612$)
- 37 male, 30 female, 1n/a
- age: 20 - 69 years ($M = 30.9$, $SD = 9.3$)

▶▶ Dependent Variables/Team learning:

- Team reflection, 4 Items (e.g., *Your team makes sure that it reflects on team's work processes*), Edmondson, 1999, $\alpha = .94$
- Team adaptation, 5 Items (e.g., *What your team discusses corresponds with what your team does subsequently*), Schippers et al. (2007), $\alpha = .81$



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4. Results – Multilevel Confirmatory Factor Analysis

▶▶ Team learning as one model

| Chi² | df | p | Chi²/df | RMSEA | 90% CI RMSEA |
|------------------------|-----------|----------|---------------------------|--------------|-------------------------|
| 170.37 | 46 | <.001 | 3.70 | 0.09 | (0.08; 0.11) |

▶▶ Team learning with two dimensions of team reflection and adaptation

| Chi² | df | p | Chi²/df | RMSEA | 90% CI RMSEA |
|------------------------|-----------|----------|---------------------------|--------------|-------------------------|
| 86.41 | 44 | <.001 | 1.96 | 0.06 | (0.04; 0.07) |

Delta Chi² (2) = 83.96, p<.001

Note: RMSEA = root mean squared error of approximation



4. Results – Hierarchical Linear Modeling

► Dependent variable: Team reflection

| Team reflection | | | |
|-----------------------------|----------------------|------------------|-----------------|
| | <i>Coeff.</i> | <i>SE</i> | <i>t</i> |
| Intercept | 3.02** | 0.05 | 56.53 |
| Virtuality | -0.28** | 0.08 | -3.37 |
| Psychological safety | 0.83** | 0.09 | 9.38 |
| Virt x PS | 0.01 | 0.04 | 0.15 |

Note: $N = 68$, * $p < .05$ ** $p < .01$



4. Results – Hierarchical Linear Modeling

► Dependent variable: Team adaptation

| Team adaptation | | | |
|-----------------------------|----------------------|------------------|-----------------|
| | <i>Coeff.</i> | <i>SE</i> | <i>t</i> |
| Intercept | 3.14** | 0.04 | 84.82 |
| Virtuality | -0.13* | 0.05 | -2.37 |
| Psychological safety | 0.39** | 0.06 | 6.00 |
| Virt x PS | -0.01 | 0.02 | -0.43 |

Note: $N = 68$, * $p < .05$ ** $p < .01$



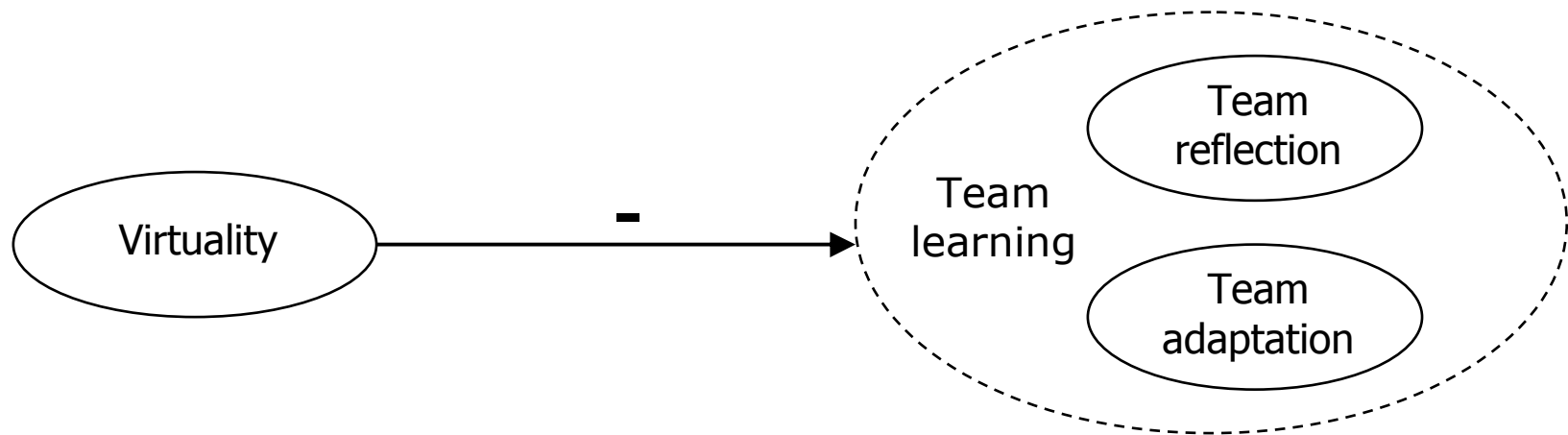
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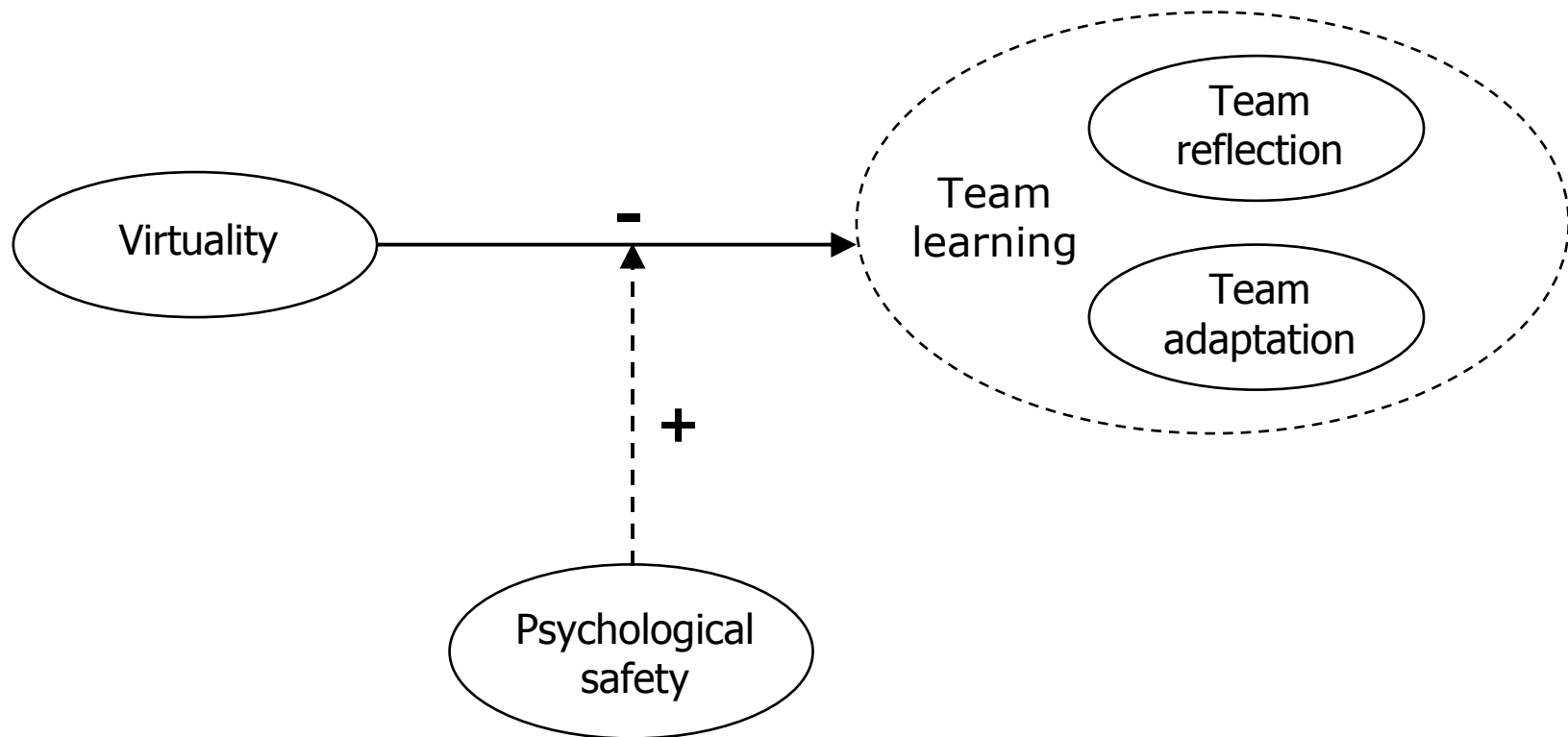
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►► Support for team reflection and team adaptation as sub-constructs



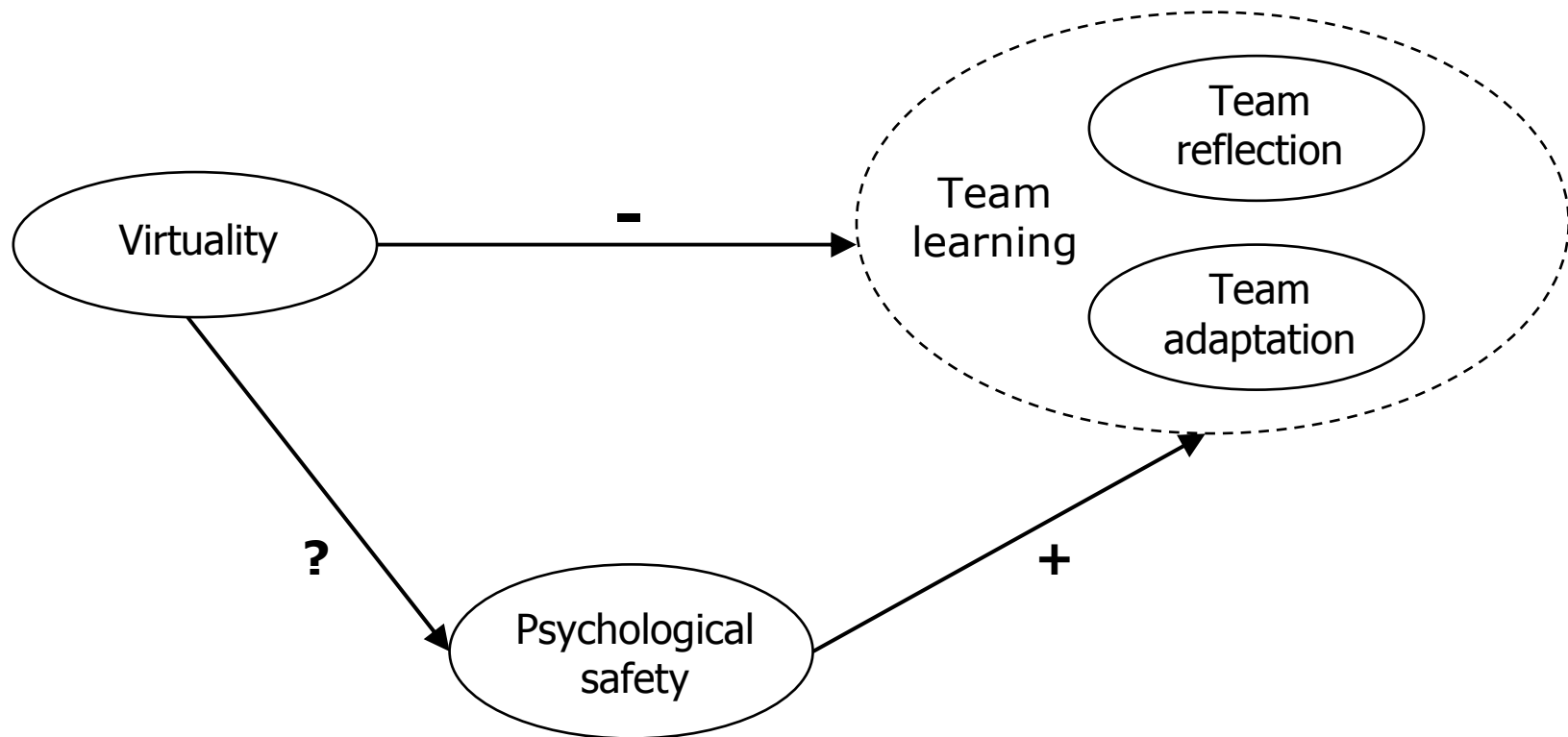
5. Discussion

►► Psychological safety not moderator...



5. Discussion

►► ... but mediator?



Thank you for your attention!

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Backup



Design – Manipulation levels

| | Degree of virtuality | Psychological safety |
|---------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------|
| Low | Rare use of elect. media Often F2F-meetings | Confidence about expectation of embarrassment, rejection, punishment for speaking up |
| Medium | Regular use of elect. media Regular F2F-meetings | Little expectation about embarrassment, rejection, punishment for speaking up |
| High | Often use of elect. media seldom F2F-meetings | Confidence about absence of embarrassment, rejection, punishment for speaking up |



Results - Correlations

| | M | SD | 1 | 2 | 3 | 4 |
|-------------------------------|----------|-----------|----------|----------|----------|----------|
| 1 Team reflection | 3.0 | 1.13 | - | | | |
| 2 Team adaptation | 3.1 | .69 | .69** | - | | |
| 3 Virtuality | 2.0 | .82 | -.20** | -.18** | - | |
| 4 Psychological safety | 2.0 | .82 | .61** | .44** | - | - |

Note: $N = 612$, * $p < .05$ ** $p < .01$



Team reflection (Edmondson, 1999)

- ▶▶ Your team regularly takes time to figure out ways to improve team's work processes
- ▶▶ Your team frequently seeks information and feedback that leads us to make important changes and improvements
- ▶▶ Your team actively reviews its own performance as regards to any deficits
- ▶▶ Your team makes sure that it reflects on the team's work processes



Team adaptation (Schippers, Den Hartog, & Koopman, 2007)

- ▶▶ In your team people keep to agreements
- ▶▶ After agreements have been made in your team, everyone does things in a similar way
- ▶▶ In this team people have their own personal interpretation of agreements even when they are written down
- ▶▶ What your team discusses corresponds with what your team does subsequently
- ▶▶ After matters have been agreed, same interpretations of the agreements exist among team members



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