Effects of Classroom Likeability Composition on Adolescent Loneliness

A Brief Introduction to the Group Actor-Partner Interdependence Model (GAPIM)

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Group composition

- Groups differ in composition
  - E.g., size, gender, ethnicity, academic ability, status
  - Heterogeneous versus homogeneous ethnic composition
  - Strong versus weak popularity hierarchy

- Multitude of questions (Kenny and Garcia, 2012)
  - Group norm or climate
  - Group diversity
  - Person-group fit (individual similarity)
  - Being a solo or token
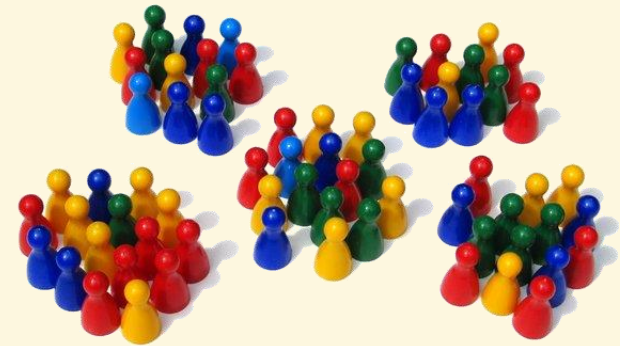
Group Actor-Partner Interdependence Model
(Kenny and Garcia, 2012)

- Extension to the Actor-Partner Interdependence Model
  (Gonzalez and Griffin, 2001; Kenny, Kashy, & Cook, 2006)

- Simultaneously modeling of multiple composition effects (e.g., person's own characteristic, group norm, individual similarity, group diversity)

- Ability to test theoretically relevant combinations
  – Excluding effects
  – Constraints

- Individual, dyadic, and group-level outcomes

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Illustrative study

- Low peer acceptance → Loneliness
  (Kingery et al., 2011; Vanhalst et al., 2014)

- Effect may depend on group composition
  - *Frog pond effect* (Davis, 1966)
  - *Optimal distinctiveness* (Brewer, 1991)

- Is a person´s self-reported loneliness affected by the peer acceptance (likeability) composition of the classroom?

Hypotheses

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- *Frog pond effect*
  - Adolescents score higher on loneliness when they are less liked than the average likeability of their group. Loneliness is most pronounced when an adolescent is very disliked in a group of generally well-liked others

- *Optimal distinctivess*
  - Adolescents score lower on loneliness when they are more similar to the average likeability of the other group members and there is more heterogeneity in likeabilty in their group

Method

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- Kandinsky Longitudinal Study (KLS)
- Participants
  - n = 945 (M_{age} = 14.27; SD = 1.25; 49% boys)

- Measures
  - Ratings on likeability
    - 6-point scale; -3 = very disliked, +3 = very well-liked
    - Average rating received from classmates
      (M = 1.19; SD = .64; range -1.83 to +2.47)
  - Self-reports on loneliness (LLCA)
    - 12 items; 4-point scale; 1 = never, 4 = often
    - E.g., I feel isolated from others; At school I feel alone.
      (M = 1.39; SD = .46; range 1 to 3.83)

GAPIM-I Model

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- For individual loneliness Y_{ik} for person *i* in group *k*:

$$Y_{ik} = b_{0k} + b_1 X_{ik} + b_2 X_{ik}' + b_3 I_{ik} + b_4 I_{ik}' + e_{ik}$$

b_1: *actor effect (X),* the effect of a person's received likability rating on that person's self-reported loneliness

b_2: *others effect (X'),* the effect of the average likeability rating of the other *n* – 1 members of the group

b_3: *actor similarity effect (I)*, the effect of the average similarity of person *i*'s likability rating to the likeability rating of the other *n* – 1 members of the group

b_4: *others' similarity effect (I'),* the effect of the average similarity of the likeability rating of all possible pairs of others in the group

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Hypotheses

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- *Actor effect (b_1)*: adolescents score lower on loneliness when they are more liked

- *Others effect (b_2)*: adolescents score lower on loneliness when other group members score higher on likeability

- *Actor similarity effect (b_3)*: adolescents who are more similar in likeability to the average likeability of their group score lower on loneliness

- *Others similarity effect (b_4)*: adolescents score lower on loneliness in a classroom where group members are more dissimilar in likeability to each other (more heterogeneity)

Strategy of analysis

- Step 1: Create an individual dataset, one record for each participant with a group identifier (assuming all group members are participants)

- Step 2: Calculate the four group composition terms
  (see Garcia, Meagher, and Kenny, 2014)

- Step 3: Estimate (*) an empty model, a main effects model, and a complete model. Assess improvement in model fit (decreases in sample-adjusted BIC)

- Step 4: Estimate (*) and compare relevant submodels

(*) Using a technique that accurately models the nonindependence

Step 2: Calculate terms

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- *Actor likeability* (*X*)

- *Others' likeability* (*X'*)
  - (*n* * *AVG*(likeability) – actor likeability [*X*]) / (*n* – 1)

- *Actor similarity* (*I*)
  - *ABS*(*actor likeability* [*X*] – others' likeability [*X'*])

- *Others' similarity* (*I'*)
  - Standard deviation in likeability of the n – 1 others in the classroom, $\sqrt{[ns^2 - I_i^2 / n - 2]}$, where s^2 is the variance within the classroom

Step 2: Calculate terms

Illustrative study

- *Actor likeability* (*X*)

- *Others' likeability* (*X'*)
  - (*n* * *AVG*(likeability) – actor likeability [*X*]) / (*n* – 1)

- *Actor dissimilarity* (*I*)
  - -1 * *ABS*(*actor likeability* [*X*] – others' likeability [*X'*])

- *Others' dissimilarity* (*I'*)
  - Standard deviation in likeability of the n – 1 others in the classroom, --1 * $\sqrt{[ns^2 - I_i^2 / n - 2]}$, where s^2 is the variance within the classroom

Step 3: Estimate models

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- Complete model

```
VARIABLE:
    USEVARIABLES ARE lonely X Xprime I Iprime;
    CLUSTER IS groupid;
    WITHIN IS X Xprime I Iprime;
MODEL:
    %WITHIN%
        lonely ON X;
        lonely ON Xprime;
        lonely ON I;
        lonely ON Iprime;
    %BETWEEN%
        lonely;
```

Step 3: Estimate models

Illustrative study

- Empty, Main and Complete model

Table 1

Group Composition Effect Estimates of Likeability on Loneliness

	Main effects		Dissimilarity effects		Fit	
Model	Actor Likeability	Others' Likeability	Actor dissimilarity	Others' dissimilarity	SABIC[b]	Adjusted R^2
Empty	0^a	0^a	0^a	0^a	1238.240	.000
Main	-0.186**	0.171**	0^a	0^a	1192.255	.055
Complete	-0.147**	0.120*	-0.161**	0.138	1192.439	.062

Note. $* p < .05$; $** p < .01$

[a] Constrained to zero.

[b] A significantly smaller SABIC (Sample-size-Adjusted Bayesian Information Criterion) means a better fitting model.

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Step 4: Estimate submodels

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- To test for frog pond effect (Social Comparison Theory), constrain both main effects to be equal but with opposite signs (*contrast model*; b_1-$b_2 = 0$)
  - Warranted because estimates are close in magnitude and in opposite direction

- To test for optimal distinctiveness, constrain both dissimilarity effects to be equal but with opposite signs (*interaction contrast model*; b_3-$b_4 = 0$)
  - Warranted because estimates are close in magnitude and in opposite direction

- Full contrast model (b_1-$b_2 = 0$ and b_3-$b_4 = 0$)

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Step 4: Estimate submodels

Illustrative study

- Full contrast model

```
VARIABLE:
      USEVARIABLES ARE lonely X Xprime I Iprime;
      CLUSTER IS groupid;
      WITHIN IS X Xprime I Iprime;
MODEL:
      %WITHIN%
          lonely ON X (a);
          lonely ON Xprime (b);
          lonely ON I (c);
          lonely ON Iprime (d);
      %BETWEEN%
          lonely;
      MODEL CONSTRAINT:
          b = -1 * a;
          d = -1 * c;
```

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Step 4: Estimate submodels

Illustrative study

Table 1

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Complete	-0.147 **	0.120 *	-0.161 **	0.138	1192.439	.062
Contrast	-0.146 ** [c]	0.146 ** [c]	-0.161 *	0.149	1188.895	.061
Int. contrast	-0.146 **	0.124 *	-0.165 ** [c]	0.165 ** [c]	1188.893	.062
Full contrast	-0.145 ** [c]	0.145 ** [c]	-0.167 ** [c]	0.167 ** [c]	1185.383	.062

Note. * $p < .05$; ** $p < .01$
[a] Constrained to zero.
[b] A significantly smaller SABIC (Sample-size-Adjusted Bayesian Information Criterion) means a better fitting model.
[c] Constrained to be equal, but with opposite signs.

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Model selection

- How to select the most parsimonious and theoretically relevant model (what social-psychological process is likely occuring)?
  (see Garcia, Meagher, and Kenny, 2014)

  - A. Best submodel should fit at least as well as the complete model
  - B. The effect of the term computed and added into the submodel should be statistically significant
  - C. It should be the best fitting submodel of all submodels that have statistically significant effects of their submodel terms

Step 4: Estimate submodels

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Conclusion

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- Frog pond effect confirmed
  - Loneliness was most pronounced for disliked adolescents in groups of generally liked others (Group B)

- Optimal distinctiveness confirmed
  - Loneliness was lowest when (a) adolescents were similar to the average likeability of their group, and (b) there was heterogeneity among the other group members (Group A and D)

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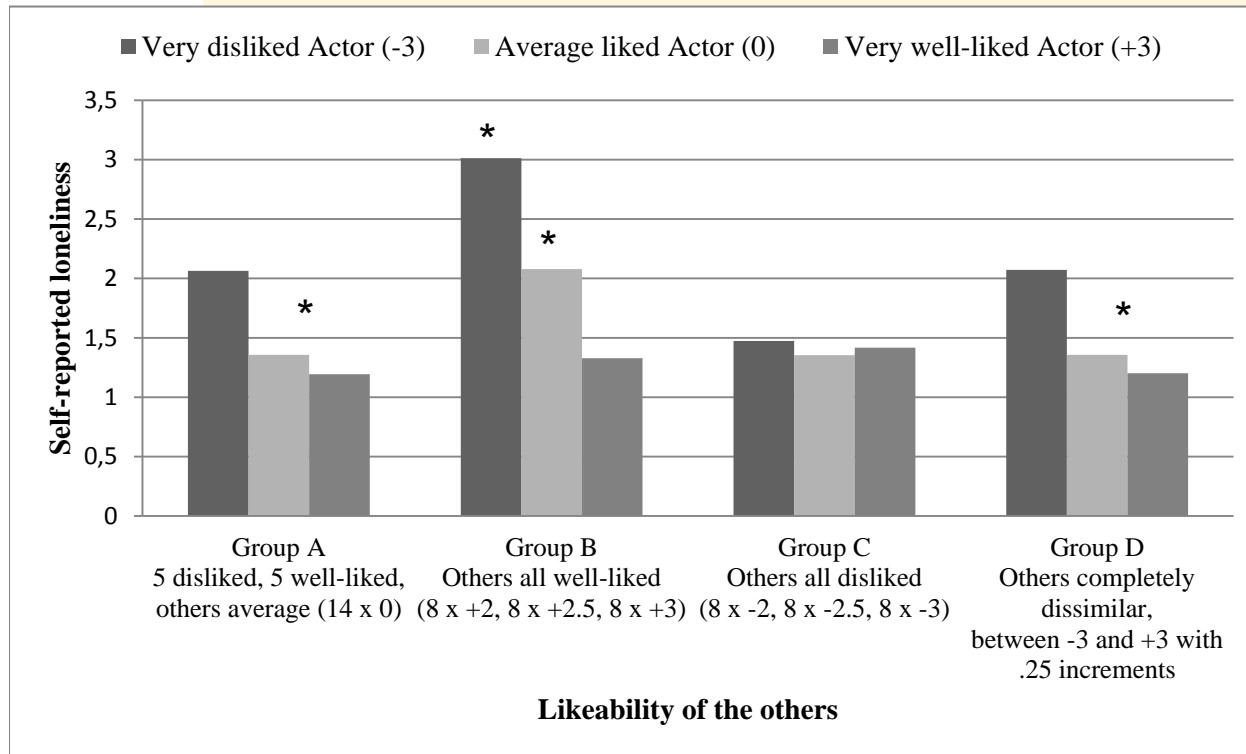# Conclusion

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Figure 1. Predicted means using full contrast model of likeability composition effects on adolescent lonelines for 25-person groups with different compositions (e.g., Group B contains 8 others who score +2 on likeability, 8 score +2.5, and the remaining 8 score +3).

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Conclusion

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- Peer group context, specifically group likeability composition, important to understand adolescent loneliness
  - Small though significant effect (6.2% modeled variance)
  - It doesn't matter so much if one is well-liked; it does matter considerably when one is average liked or disliked
  - Not much happening in disliked group, but questionable whether this is meaningful hypothetical group

- GAPIM promosing new approach in research on person-environment fit and group composition effects

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Further reading

- Kenny, D. A. et al. (2002). The Statistical Analysis of Data From Small Groups. *Journal of Personality and Social Psychology*, *83*, 126-137.

- Kenny, D. A., & Garcia, R. L. (2012). Using the Actor-Partner Interdependence Model to Study the Effects of Group Composition. *Small Group Research*, *43*, 468-496.

- Garcia, R. L., Meagher, B. R., & Kenny, D. A. (2014). Analyzing the effects of group members' characteristics: A guide to the group actor-partner interdepedence model. *Group Processes & Intergroup Relations*. Advanced online publication. http://dx.doi.org/10.1177/1368430214556370

Thank you for your attention!

Any questions or comments?

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