AUTISM PEER NETWORKS PROJECT

IES R324A090091

Debra Kamps, Rose Mason, Linda Heitzman-Powell Kathy Thiemann-Bourque, Ilene Schwartz, Nancy Rosenberg, Suzanne Cox
Juniper Gardens Children’s Project
University of Kansas
**Peer Networks: A Social Intervention that is Evidence-Based**

- Small group of peers serving in a defined role: assistance, support, tutors, reinforcing agents. Peers receive training and give input to the goals and activities (Haring & Breen 1992)

- National Research Council (2001) – peer-mediated interventions are an empirically supported communication intervention

Autism Peer Networks Intervention*

Peer Networks Intervention:

1. Reading Mastery Networks: focus child and 2 peers
2. Social Peer Network: focus child and 2 peers

   social communication skills:
   
   Share and ask (shares and questions)
   Tell about it (comments)
   Talk nice (social niceties)
   Taking turns, Helping
   Give ideas for play (play organizers)

* Principal Investigators: Kamps, Heitzman-Powell, Thiemann-Bourque, Schwartz
# Participants

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender</th>
<th>CARS</th>
<th>PPVT</th>
<th>SRS</th>
<th>Vineland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>44 males</td>
<td>32.6 (21-41)</td>
<td>87.6 (50-135)</td>
<td>63.1 (43-81)</td>
<td>86.2 (51-116)</td>
</tr>
<tr>
<td>N = 51</td>
<td>7 females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison</td>
<td>31 males</td>
<td>32.0 (22.5-42)</td>
<td>84.5 (44-123)</td>
<td>66.4 (48-86)</td>
<td>81.5 (42-120)</td>
</tr>
<tr>
<td>N = 39</td>
<td>8 females</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

51 schools across 13 districts in KS/MO & WA

52 children with ASD and 350+ peers involved
Social Peer Networks Structure

- **Scripts** created for implementers to teach target social-communication skills
- Written **text cues** and visuals/graphics to prompt skills
- Teacher-nominated **peers** rotate to attend group
- Variety of social and academic games
- Three 30-min sessions/week
  - 10 min teaching
  - 10-15 free play
  - 5-min feedback/reward
Text Cues & Reinforcement Cards

Ways to play

Let's play ________

Okay, I'll be the ______

Tell about friends' toys and talk nice

You have a ___

Yeah, it's ____

Tell about my toys and talk nice

It's a ______

Cool

Ask, share and talk nice

May I have it?

Here you go

Thank you

You're welcome
**S’Match Game**

### Ways to play

<table>
<thead>
<tr>
<th>Let’s play_________</th>
<th>Okay, I’ll be the___</th>
</tr>
</thead>
<tbody>
<tr>
<td>Let’s change the rules</td>
<td>Maybe we can _____</td>
</tr>
<tr>
<td>Can we change jobs?</td>
<td>Sure, can I be the__?</td>
</tr>
</tbody>
</table>

### Tell about it – friends’ toys

<table>
<thead>
<tr>
<th>Your category is __.</th>
<th>You have a match!</th>
</tr>
</thead>
<tbody>
<tr>
<td>You found a _______</td>
<td>Good try!</td>
</tr>
</tbody>
</table>

### Tell about it - my toys

<table>
<thead>
<tr>
<th>I found a color match!</th>
<th>I did it!</th>
</tr>
</thead>
<tbody>
<tr>
<td>I found two _________!</td>
<td>Mine is an animal.</td>
</tr>
</tbody>
</table>

### Ask and Share

<table>
<thead>
<tr>
<th>Is it a match?</th>
<th>Pick two!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Push the button</td>
<td>Pass the spinner, please.</td>
</tr>
<tr>
<td>What color is it?</td>
<td>What animal do you like?</td>
</tr>
</tbody>
</table>
ZINGO = Tell about friend’s toys and talk nice

**Tell what friend has**

You need a ____.  
Yes, and you need a ____.  
Thanks. You don’t need that.

**Tell what friend is doing**

You have the box.  
You have the box now.  
You are close too!

**Answer back**

You have the box.  
It’s a ____, you have it.  
You pushed the box.

**Say something nice**

You have the box now.  
Yes, thanks.  
You don’t need this card.
**Project Findings: Social Networks**

- Average communication acts per 10-min probes: baseline = 13.9; During peer network treatment sessions, average = 29 for kinder; 37 for 1st graders

- Generalization to natural settings: children in Peer Networks showed slightly more generalization than comparison group

- *Teacher Impression Scale-TIS*, teacher ratings of social skills and peer cooperative behaviors, a significant effect for the interaction of group*time for kinder and 1st.

- *Teacher Ratings of Classroom Independent Behaviors*: following instructions, social-communication, transition, a significant effect for the interaction of group*time for kinder only
Social-Communicative Behaviors in Peer Network Social Groups: 10-min Probes N=51
Focus Child #138 Communication Behaviors Over 2 Years: CARS 38; PPVT 68

Baseline

Kindergarten - Peer Networks

1st Grade – Peer Networks

Communication Acts/10 minutes

Total Communication Acts

Spontaneous Communication

0 10 20 30 40 50 60

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Focus Child #328 Communication Behaviors Over 2 Years: CARS 38: PPVT 68

- Baseline
- Kindergarten - Peer Networks
- 1st Grade - Peer Networks

Graph showing the trend of Total Communication Acts and Spontaneous Communication over the years from 1 to 20.
Social Peer Networks for Four First Graders

<table>
<thead>
<tr>
<th>Subject</th>
<th>Tau Effect Size</th>
<th>P-value</th>
<th>90% CI Lower Limit</th>
<th>90% CI Upper Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.91</td>
<td>.005</td>
<td>.37</td>
<td>1.45</td>
</tr>
<tr>
<td>2</td>
<td>.94</td>
<td>.001</td>
<td>.53</td>
<td>1.34</td>
</tr>
<tr>
<td>3</td>
<td>.88</td>
<td>.002</td>
<td>.47</td>
<td>1.29</td>
</tr>
<tr>
<td>4</td>
<td>1.00</td>
<td>.003</td>
<td>.52</td>
<td>1.48</td>
</tr>
<tr>
<td>Average</td>
<td>.93</td>
<td>.000</td>
<td>.68</td>
<td>1.23</td>
</tr>
</tbody>
</table>
### Average Total Communicative Acts

**Pre - Kinder mid/end to First Grade mid/end - Post**

**Cohorts 1 & 2 N=29**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Base</th>
<th>Mid K</th>
<th>End K</th>
<th>Mid 1st</th>
<th>End 1st</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Mid K</td>
<td></td>
<td></td>
<td>ns</td>
<td>.001</td>
<td>.001</td>
</tr>
<tr>
<td>End K</td>
<td>.000</td>
<td></td>
<td></td>
<td>.001</td>
<td>.001</td>
</tr>
<tr>
<td>Mid 1st</td>
<td>.000</td>
<td>.001</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End 1st</td>
<td>.000</td>
<td>.001</td>
<td>.001</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

*p-values for the mean difference of each pairwise comparison*
**Teacher Impression Ratings: Least Squares Means**

*For Kindergarten and First Grade there is a significant effect for time, and a significant effect for the interaction of Group*time.*

<table>
<thead>
<tr>
<th>Effect</th>
<th>Time</th>
<th>Kindergarten Estimate</th>
<th>First Grade Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer networks</td>
<td>Fall</td>
<td>17.8032</td>
<td>20.1937</td>
</tr>
<tr>
<td>Peer networks</td>
<td>Winter</td>
<td>21.4300</td>
<td>22.1065</td>
</tr>
<tr>
<td>Peer networks</td>
<td>Spring</td>
<td>22.2085</td>
<td>24.3775</td>
</tr>
<tr>
<td>Comparison</td>
<td>Fall</td>
<td>17.8632</td>
<td>18.0703</td>
</tr>
<tr>
<td>Comparison</td>
<td>Winter</td>
<td>19.1654</td>
<td>20.7010</td>
</tr>
<tr>
<td>Comparison</td>
<td>Spring</td>
<td>18.5789</td>
<td>20.3558</td>
</tr>
</tbody>
</table>
Recess Peer Networks/Skills:
(a) playing together and having fun, (b) complimenting, encouraging our friends, (c) talking about what we’re doing and giving ideas, and (d) using names and getting attention.

Steps:
1. Priming
2. Huddles/every 5 minutes
3. Prompting
4. Feedback & Rewards
Recess Peer Network Procedures:
1. Select 2 friends to play with
2. Choose game
3. Brief practice
4. Prompts to children with ASD and peers during recess
5. Feedback & rewards after recess
Project Highlights: Reading Networks

• *Reading Mastery* networks were effortful to train and required ongoing coaching.

• *DIBELS Nonsense Word Fluency* and *DIBELS Oral Reading Fluency*: a significant interaction for time*intervention from kinder to first for “beginning readers”

• *CBM-Reading Mastery Words*: a significant interaction for time*intervention from kinder to first for “beginning readers”

• *Woodcock Word ID subtest*: a significant interaction for time*intervention from kinder to first for “beginning readers” (however the exp group was lower at start)

• *Woodcock Word Attack and Passage Comprehension subtests*: a significant interaction for time*intervention from kinder to first for children who were “already readers”
All Readers in Reading Mastery: DIBELS Nonsense Word Fluency Kinder fall to spring

![Graph](image)

Beginning readers exp = 9 to 23.6 (n=33); comp 16.9 to 30.2 (n=28)

There are significant effects for time, Beginning Reader, and the 3 way interaction of time*intervention by Beginning reader status. Nonsense scores increase over time, and are higher for those who are not beginning readers. While both groups saw gains over time, those in the Intervention group saw larger gains if they were beginning readers.
There are significant effects for time, Beginning Reader, and the 3 way interaction of time by Intervention by Beginning reader status. RMW scores increase over time, and are higher for those who are not beginning readers. While both groups saw gains over time, those in the Intervention group especially saw larger gains if they were beginning readers.
**DIBELS Oral Reading Fluency 1st Grade**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Intervention</th>
<th>time</th>
<th>Already Reading</th>
<th>Beginning Reader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention*time</td>
<td>Comp reading</td>
<td>4</td>
<td>76.7</td>
<td>21.4</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Comp reading</td>
<td>5</td>
<td>100.3</td>
<td>31.9</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Comp reading</td>
<td>6</td>
<td>99.6</td>
<td>37.3</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Reading Mastery</td>
<td>4</td>
<td>79.3</td>
<td>14.5</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Reading Mastery</td>
<td>5</td>
<td>105.2</td>
<td>28.9</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Reading Mastery</td>
<td>6</td>
<td>107.8</td>
<td>34.7</td>
</tr>
</tbody>
</table>

There are significant effects for time, Beginning Reader, and the 3 way interaction of time by Intervention by Beginning reader status. Scores increase over time, and are higher for those who are “already readers”. While both groups saw gains over time, those in the Intervention group saw larger gains, and had higher scores in comparison to the other group if “already reading”.
**Woodcock Word ID subtest**  
“Already Reading” Exp & Comp Least Squares Means

<table>
<thead>
<tr>
<th>Effect</th>
<th>Intervention</th>
<th>Time in months</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention*time</td>
<td>Comp reading</td>
<td>Fall of kinder</td>
<td>40.0625</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Comp reading</td>
<td>Fall of 1st grade</td>
<td>53.8847</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Comp reading</td>
<td>Spring of 1st grade</td>
<td>60.3514</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Reading Mastery</td>
<td>Fall of kinder</td>
<td>36.1000</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Reading Mastery</td>
<td>Fall of 1st grade</td>
<td>55.1228</td>
</tr>
<tr>
<td>Intervention*time</td>
<td>Reading Mastery</td>
<td>Spring of 1st grade</td>
<td>63.3450</td>
</tr>
</tbody>
</table>

“Beginning readers” exp = 5.5 (kinder) to 36.9 (end of first); comp reading group = 11.6 (kinder) to 35.3 (end of first)

For beginning readers, there is a significant effect for time and time*intervention group. Those in the Reading Mastery saw greater gains than those in the regular class. There is no significance between groups for children ‘already reading.’
Other Project Findings

Variability in standardized tests

- **CELF Sentence Recall & Core Language**: significant time*group interaction (no significant group effects for expressive vocabulary, concepts and following directions, subtest or word structure)
- **Vineland Communication subtest**: significant time*group interaction for first grade but not for kinder (no significant group effects for social subtest)
- **Peabody Picture Vocabulary Test**: no significant intervention effects noted
- **Social Responsiveness Scale-Teacher**: no significant intervention effects noted
Conclusions

• Social groups increase social interactions between students with autism and their peers
• Peer networks, given enough dosage, are one way to overcome the challenges of autism
• Peer networks provide tools to navigate social situations
• Both peers and focus children enjoy the groups
• Teachers find the groups beneficial but hard to schedule
Future Directions

- How can we adapt Peer Networks to be less resource intensive, and yet still effective?
- What do Peer Networks look like for adolescent and adults with ASD?
- What are the target skills for community-based settings?
- What are the most efficient and acceptable teaching strategies?
- What are priorities for meaningful outcomes?
Thank you!

For more information contact:
Debra Kamps
dkamps@ku.edu