# A BRIEF SOCIAL-EMOTIONAL SKILLS ASSESSMENT FOR TIER 2 INTERVENTION: THE ISP-SKILLS

**ies** INSTITUTE OF EDUCATION SCIENCES

**Project ISP**

STEPHEN KILGUS, PH.D., *UNIVERSITY OF WISCONSIN-MADISON*

NATHANIEL VON DER EMBSE, PH.D., *UNIVERSITY OF SOUTH FLORIDA*

KATIE EKLUND, PH.D., *UNIVERSITY OF WISCONSIN-MADISON*

---

## CURRENT STATE OF CHILD & ADOLESCENT MENTAL HEALTH: A "PUBLIC HEALTH CRISIS"

- Approximately 20% of children are experiencing significant mental, emotional, or behavioral symptoms that would qualify them for a psychiatric diagnosis.
  (Burns et al., 1995; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003)

- "Most people with mental disorders in the U.S. remain either untreated or poorly treated"
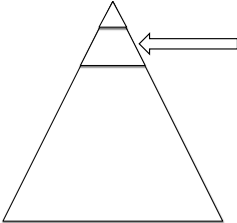  (Kessler et al., 2005)



---

## DIFFICULTIES WITH EXTERNAL OBSERVATIONS
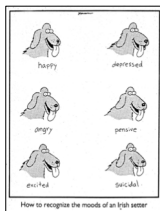
## TIER 2 INTERVENTION

- Brief, low cost, and targeted interventions for students at-risk for social-emotional and behavioral concerns
- Purposes:
  - Support those unresponsive to Tier 1 supports
  - Prevent further development of student concerns

## CAN'T DO VERSUS WON'T DO

- **Interventions for skill deficits**
  - Can't do problems
  - **Instructional intervention** to teach student skill they haven't learned (acquisition or fluency deficit)
  - Examples:
    - Social skills training (SST)
    - Social and emotional learning

- **Intervention for performance deficits**
  - Won't do problem (motivational deficit)
  - **Contingency management intervention** embedded in the environment to promote use of behaviors/skills the student possesses
  - Examples:
    - Check In/Check Out (CICO)
    - Daily report cards
    - Behavior contracts

## APPROACHES TO TIER 2

| Standard Protocol | Problem Solving | Hybrid Approach |
|---|---|---|
| • One intervention<br>• Usually targets performance deficits (e.g., CICO) | • Multiple interventions<br>• Data-based decision making to select<br>• Both skill and performance deficits | • Standard protocol (for all)<br>• Progress monitoring<br>• Problem analysis (for some)<br>• Adapted intervention |

## TIER 2 INTERVENTION

- Research appears to support the use of the hybrid approach
- Standard protocol interventions work for many (Cook et al., 2008; Maggin et al., 2015)
- Adapting interventions to match student needs can enhance effects
  - Adapted CICO more effective for students whose behavior functions to escape instruction (Kilgus et al., 2016)
  - SST more effective when matched to student social skill deficits (Barreras, 2008)

---

## TIER 2: HYBRID APPROACH

- Begin with **standard protocol**
  - Likely to be effective for most
  - However, for some, standard protocol is unlikely to be effective
- When **adapted intervention** is necessary
  - Educators must ask: *What data do I need to support adaptation?*
  - **Problem analysis assessment**

---

## PROBLEM ANALYSIS

- What do we need to know?
- **Contingency management interventions (e.g., CICO)**
  - *Brief FBA*
    - Problem behaviors of concern
    - Function of these behaviors
- **Instructional interventions (e.g., SST)**
  - *Skills assessment*
    - Which domain is problematic (e.g., social-emotional skills)
    - Which particular skills are lacking within that domain

Problem Analysis

### SHORTCOMINGS OF EXISTING ASSESSMENTS

- Lack of convincing evidence for many brief assessments (Zaja et al., 2011)
- Can take too much time for data collection and analysis
  - Can be problematic when implemented at scale (e.g., 10-15% of students in a school)
  - **Brief FBA →** 10-15 minutes per student
  - **Skills assessment →** 10-15 minutes per student
    - Examples: Social Skills Improvement System (SSIS) and the Devereux Student Strengths Assessment (DESSA)

### PURPOSE OF OUR PROJECT

- Develop and validation the **Intervention Selection Profile (ISP)**
  - **ISP-Skills***
  - **ISP-Function**

**Project ISP**

### ISP-SKILLS

- Used to assess:
  - 5 social-emotional skill domains
  - 3 academic enabling skills
- Inform matching of instructional lessons to student needs
  - Identify deficits within a student's skill profile → those to be targeted via instructional interventions

**Social-Emotional Skills**
- Self-Awareness
- Social Awareness
- Self-Management
- Relationship Skills
- Responsible Decision Making

**Academic Enablers**
- Engagement
- Motivation
- Study Skills

## Slide 1: ISP-SKILLS

**Intervention Selection Profile – Skills (ISP-Skills)**

Your Name: _____  Today's Date: _____
Child Name: _____  Child Date of Birth: _____
Relation to Child: _____  Child Grade: _____

Using the following scale, identify how frequently the child in question has displayed each of the following skills **during the previous month**. Circle only one option on the scale for each skill.

| Scale Option | Description |
|---|---|
| Never (**N**) | The child never displays the skill, indicating that he/she has not learned the skill. |
| Sometimes – Insufficient Learning (**S-IL**) | The child only sometimes displays the skill. When he/she does display the skill, it is awkward or not in accordance with developmental expectations. The child may have learned the skill to some degree, but would benefit from additional practice to display the skill correctly. |
| Sometimes – Insufficient Motivation (**S-IM**) | The child only sometimes displays the skill. When he/she does display the skill, it appears appropriate and in accordance with developmental expectations. However, he/she still requires additional rewards or reinforcement to display the skill. |
| Often (**O**) | The child displays the skill often. He/she has learned the skill and displays it at appropriate times. |
| Almost Always (**AA**) | The child displays the skill almost always. The skill is a strength for him/her. |

**Social Skills**

| | | | | | |
|---|---|---|---|---|---|
| Speaks to others in a polite, courteous, and respectful manner | N | S-IL | S-IM | O | AA |
| Helps others, shares possessions, and complies with rules | N | S-IL | S-IM | O | AA |
| Treats objects with care; takes ownership for personal roles and actions | N | S-IL | S-IM | O | AA |
| Initiates or joins activities with peers | N | S-IL | S-IM | O | AA |
| Responds to others in an appropriate and safe manner within conflict and non-conflict situations | N | S-IL | S-IM | O | AA |

- 14 item measure
- Scoring founded upon *diagnostic classification modeling (DCM)*
- Broad items corresponding to broader behavioral response classes
- Rated using a 5-point behaviorally-anchored rating scale (BARS)

## Slide 2: RESEARCH PURPOSES

1. Apply diagnostic classification modeling (DCM) to evaluate ISP-Skills performance in estimating skill profiles
2. Examine ISP-Skills scale concurrent validity relative to a series of criteria
3. Examine the diagnostic accuracy of ISP-Skills scale scores relative to the same criteria
   1. Below average
   2. Above average

## Slide 3: METHOD

## Slide 1

### PARTICIPANTS

**Teacher Info**

- Two sites (17 schools)
  - Midwest
  - Southeast
- *n* = 196 teachers
  - Female = 92%
  - 53% Bachelor's and 44% Master's
  - All general education

| Experience | Percent |
|---|---|
| ≤5 years | 31% |
| 6-10 | 22% |
| 11-15 | 18% |
| ≥16 | 29% |

| Gender | Percent |
|---|---|
| White | 82% |
| Black | 8% |
| Hispanic or Latino(a) | 7% |
| Asian | <1% |
| Other | 2% |
| Multi-race | <1% |

## Slide 2

### PARTICIPANTS

**Student Info**

- *n* = 877 students (grades K-6)
- Gender
  - 45% Female
  - 53% Male
  - 2% Prefer not to say
- Age *M* = 8.39, *SD* = 1.90 years

| Grade | % | Gender | % |
|---|---|---|---|
| K | 13% | White | 45% |
| 1 | 15% | Black | 31% |
| 2 | 14% | Hispanic or Latino(a) | 17% |
| 3 | 23% | Asian | 1% |
| 4 | 17% | Other | 4% |
| 5 | 14% | Multi-race | 2% |
| 6 | 5% | | |

## Slide 3

### PROCEDURES

- Approached each teacher within participating elementary schools
- For each participating teacher
  - 3 randomly selected students
  - 2 teacher-selected students

- Teachers then completed five measures for each participating student
  - ISP-Skills
  - Devereux Student Strengths Assessment (DESSA)
  - Social Skills Improvement System (SSIS)
  - Academic Competence Evaluation Scales (ACES)
- Randomization of measure ordering for each student
- Planned missing data (20%)

## MEASURES

- ISP-Skills
  - Dichotomous coding for DCM analyses
  - DCM-based probability scores for all other analyses
- Devereux Student Strengths Assessment (DESSA)
  - **Four subscales**: Self-Awareness, Social Awareness, Self-Management, and Responsible Decision Making
- Social Skills Improvement System (SSIS)
  - **Seven subscales**: Communication, Cooperation, Assertion, Engagement, Empathy, Self-Control, and Responsibility
  - For on total **Social Skills scale**
- Academic Competence Evaluation Scales (ACES)
  - **Three subscales**: Academic Engagement, Motivation, and Study Skills

Below Average
(-1 SD)

Average

Above Average
(+1 SD)

# RESULTS

## RESEARCH PURPOSES

1. Apply diagnostic classification modeling (DCM) to evaluate ISP-Skills performance in estimating skill profiles
2. Examine ISP-Skills scale concurrent validity relative to a series of criteria
3. Examine the diagnostic accuracy of ISP-Skills scale scores relative to the same criteria
   1. Below average
   2. Above average

## ITEM * ATTRIBUTE Q-MATRIX

| Item | | Self-Awareness | Social Awareness | Self-Management | Relationship Skills | Responsible Decision-making |
|---|---|---|---|---|---|---|
| 1 | Perceives, understands, and appreciates his/her own skills, interests, attitudes, thoughts, and emotions. | 1 | 0 | 0 | 0 | 0 |
| 2 | Perceives, understands, and appreciates others' emotions. | 0 | 1 | 0 | 0 | 0 |
| 3 | Monitors own emotions and controls his/her behavior. | 1 | 0 | 1 | 0 | 0 |
| 4 | Identifies problems and chooses socially acceptable solutions. | 0 | 1 | 0 | 0 | 1 |
| 5 | Speaks to others in a polite, courteous, and respectful manner. | 0 | 1* | 0 | 1 | 1 |
| 6 | Helps others, shares possessions, and complies with rules. | 0 | 0 | 1 | 1 | 1* |
| 7 | Treats objects with care; takes ownership for personal roles and actions. | 0 | 0 | 1 | 0 | 1 |
| 8 | Initiates or joins activities with peers. | 0 | 0 | 0 | 1 | 0 |
| 9 | Responds to others in an appropriate and safe manner within conflict and non-conflict situations. | 0 | 0 | 1 | 1 | 1 |

## ITEM * ATTRIBUTE Q-MATRIX

| Item | | Study Skills | Engagement | Motivation |
|---|---|---|---|---|
| 10 | Adequately prepares for quizzes, tests, and assignments. | 1 | 0 | 0 |
| 11 | Takes good notes; Effectively organizes materials and assignments. | 1 | 0 | 0 |
| 12 | Actively or passively participates in classroom instruction and activities. | 0 | 1 | 0 |
| 13 | Can complete assignments independently; Can work alone for an extended period of time. | 0 | 0 | 1 |
| 14 | Interested in and excited for academics; Produces quality work. | 0 | 0 | 1 |

## DIAGNOSTIC CLASSIFICATION MODELING

Attribute mastery profiles were estimated using the generalized deterministic input noisy and-gate (G-DINA) model (de la Torre, 2011)

- This model estimates the probability that a student with a particular skill pattern will answer item $j$ correctly:

$$(X_j = 1 | \alpha^*_{lj}) = \delta_{j0} + \sum_{k=1}^{K^*_j} \delta_{jk} \alpha_{lk} + \sum_{k=1}^{K^*_j-1} \sum_{k'=k+1}^{K^*_j} \delta_{jkk'} \alpha_{lk} \alpha_{lk'} + \cdots + \delta_{j12...K^*_j} \prod_{k=1}^{K^*_j} \alpha_{lk}$$
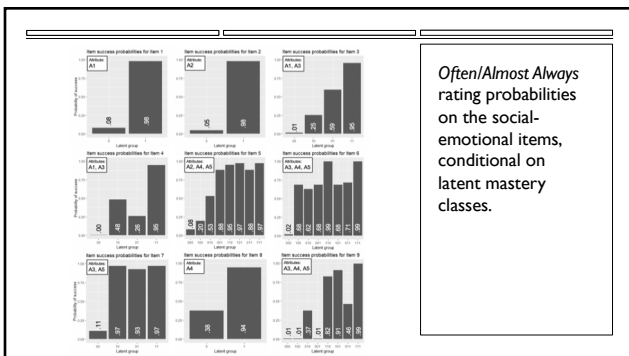
where

$\alpha^*_{lj}$ = the attributes required by item $j$ (as specified in the Q-matrix)

$\alpha$s = attribute parameters

$\delta$s = item parameters

- Specifically, we used the sequential G-DINA (Ma & de la Torre, 2016) to accommodate the polytomous response scale of the ISP-Skills items

| Item | Attribute | G-DINA coefficients | | $P(x = \textit{Often/Almost Always})$ if attribute is mastered |
| | | $\delta_0$ | $\delta_1$ | |
| --- | --- | --- | --- | --- |
| 10 | A6 | .03 | .89 | .94 |
| 11 | A6 | .05 | .84 | .89 |
| 12 | A7 | .07 | .90 | .97 |
| 13 | A8 | .09 | .85 | .94 |
| 14 | A8 | .06 | .85 | .91 |

*Note. N* = 879. Attribute A6 = study skills; A7 = academic engagement; A8 = motivation. Standardized root mean square of the residuals = .032.

Parameter estimates obtained from fitting the G-DINA model to **Academic Enabler** item data



*Often/Almost Always* rating probabilities on the social-emotional items, conditional on latent mastery classes.

| A1 | A2 | A3 | A4 | A5 | Frequency | Classification Accuracy |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 1 | 393 | 0.99 |
| 0 | 0 | 0 | 0 | 0 | 269 | 0.97 |
| 0 | 0 | 0 | 1 | 1 | 30 | 0.69 |
| 0 | 0 | 1 | 0 | 1 | 26 | 0.63 |
| 0 | 1 | 1 | 1 | 0 | 24 | 0.64 |
| 1 | 0 | 0 | 1 | 1 | 22 | 0.69 |
| 0 | 0 | 0 | 1 | 0 | 19 | 0.54 |
| 0 | 0 | 1 | 0 | 0 | 16 | 0.73 |
| 1 | 1 | 0 | 1 | 1 | 16 | 0.54 |
| 0 | 0 | 1 | 1 | 1 | 14 | 0.56 |
| 1 | 1 | 1 | 0 | 0 | 12 | 0.8 |
| 1 | 0 | 0 | 0 | 0 | 9 | 0.85 |
| 1 | 1 | 1 | 0 | 1 | 7 | 0.37 |
| 1 | 0 | 0 | 1 | 0 | 5 | 0.51 |
| 0 | 1 | 1 | 0 | 1 | 5 | 0.56 |
| 0 | 1 | 0 | 1 | 0 | 4 | 0.81 |
| 1 | 1 | 0 | 1 | 0 | 4 | 0.56 |
| 1 | 0 | 1 | 0 | 0 | 3 | 0.86 |
| 1 | 0 | 1 | 1 | 0 | 1 | 0.63 |

A1 = self-awareness (.97); A2 = social awareness (.98); A3 = self-management (.96); A4 = relationship skills (.94); A5 = responsible decision-making (.96). Test-level classification accuracy = .885.

MOST COMMON **SOCIAL-EMOTIONAL** MASTERY PATTERNS

## Slide 1

| A1 | A2 | A3 | Frequency | Classification Accuracy |
|----|----|----|-----------|-------------------------|
| 1 | 1 | 1 | 371 | 0.99 |
| 0 | 0 | 0 | 354 | 0.93 |
| 0 | 1 | 0 | 127 | 0.94 |
| 0 | 1 | 1 | 25 | 0.63 |
| 1 | 0 | 0 | 2 | 0.70 |
| 0 | 0 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 0 |

MOST COMMON **ACADEMIC ENABLER** MASTERY PATTERNS
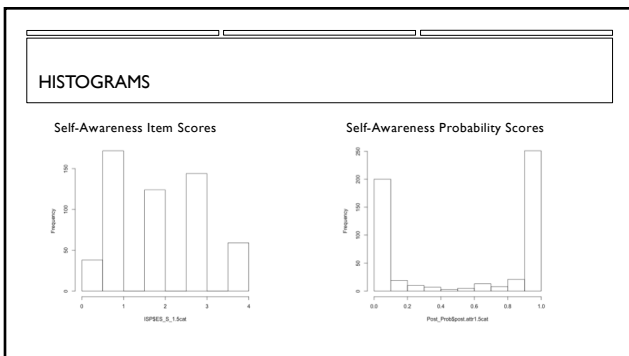
## Slide 2

HISTOGRAMS

Self-Awareness Item Scores

Self-Awareness Probability Scores



## Slide 3

RESEARCH PURPOSES

1. Apply diagnostic classification modeling (DCM) to evaluate ISP-Skills performance in estimating skill profiles
2. Examine ISP-Skills scale concurrent validity relative to a series of criteria
3. Examine the diagnostic accuracy of ISP-Skills scale scores relative to the same criteria
   1. Below average
   2. Above average

## SPEARMAN'S ρ CORRELATIONS

| Criterion | ISP-Skills Scales | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Self-Awareness | Social Awareness | Self-Management | Relationship Skills | Responsible DM | Engagement | Motivation | Study Skills |
| DESSA Self-Awareness | .70 | .70 | .59 | .68 | .67 | .72 | .72 | .71 |
| DESSA Social Awareness | .81 | .83 | .78 | .79 | .81 | .66 | .66 | .65 |
| DESSA Self-Management | .80 | .82 | .78 | .78 | .81 | .71 | .72 | .71 |
| SSIS Total | .83 | .85 | .78 | .82 | .81 | .69 | .69 | .69 |
| DESSA Responsible DM | .80 | .83 | .78 | .78 | .80 | .69 | .70 | .69 |
| ACES Engagement | .61 | .60 | .46 | .60 | .55 | .74 | .73 | .73 |
| ACES Motivation | .70 | .70 | .60 | .67 | .67 | .85 | .86 | .85 |
| ACES Study Skills | .69 | .69 | .61 | .66 | .67 | .83 | .84 | .84 |

## RESEARCH PURPOSES

1. Apply diagnostic classification modeling (DCM) to evaluate ISP-Skills performance in estimating skill profiles
2. Examine ISP-Skills scale concurrent validity relative to a series of criteria
3. Examine the diagnostic accuracy of ISP-Skills scale scores relative to the same criteria
   1. Below average
   2. Above average

## DIAGNOSTIC ACCURACY

- Area under the curve (AUC) statistics
  - .50–.70 = low
  - .70–.90 = moderate
  - .90–1.00 = high

- Conditional probability statistics
  - Sensitivity (SE; >.80 = acceptable)
  - Specificity (SP; >.70 = acceptable)
  - Positive predictive value (PPV)
  - Negative predictive value (NPV)
  - Correct classification (CC)

Hintze & Silberglitt, 2005; Streiner & Cairney, 2007

## CRITERION BASE RATES

|  | Below Average | Average | Above Average |
|---|---|---|---|
| SSIS Total | 48% | 44% | 8% |
| DESSA Self-Awareness | 36% | 55% | 9% |
| DESSA Social Awareness | 42% | 48% | 10% |
| DESSA Self-Management | 40% | 51% | 9% |
| DESSA Responsible DM | 38% | 53% | 9% |
| ACES Study Skills | 55% | 42% | 3% |
| ACES Engagement | 38% | 59% | 3% |
| ACES Motivation | 43% | 53% | 4% |
| Average % | 43% | 50% | 7% |

## DIAGNOSTIC ACCURACY – BELOW AVERAGE

|  | AUC |
|---|---|
| Self-Awareness | .84 (.80-.87) |
| Social Awareness | .90 (.88-.92) |
| Self-Management | .90 (.88-.92) |
| Relationship Skills | .92 (.91-.94) |
| Responsible DM | .90 (.88-.92) |
| Study Skills | .91 (.89-.93) |
| Engagement | .85 (.82-.87) |
| Motivation | .89 (.87-.91) |



## CONDITIONAL PROBABILITIES – BELOW AVERAGE

|  | Cut Score | SE | SP | PPV | NPV | CC |
|---|---|---|---|---|---|---|
| Self-Awareness | .06 | .86 | .70 | .50 | .93 | .74 |
| Social Awareness | .01 | .90 | .81 | .65 | .95 | .84 |
| Self-Management | .06 | .89 | .81 | .62 | .96 | .83 |
| Relationship Skills | .41 | .87 | .86 | .74 | .93 | .86 |
| Responsible DM | .04 | .85 | .83 | .64 | .94 | .84 |
| Study Skills | .02 | .91 | .81 | .76 | .93 | .85 |
| Engagement | .01 | .82 | .79 | .56 | .93 | .80 |
| Motivation | .01 | .94 | .75 | .61 | .97 | .81 |

## DIAGNOSTIC ACCURACY – ABOVE AVERAGE

| | AUC |
|---|---|
| Self-Awareness | .86 (.84-.88) |
| Social Awareness | .88 (.86-.90) |
| Self-Management | .84 (.82-.87) |
| Relationship Skills | .87 (.85-.89) |
| Responsible DM | .86 (.84-.88) |
| Study Skills | .87 (.86-.89) |
| Engagement | .86 (.84-.88) |
| Motivation | .89 (.88-.91) |
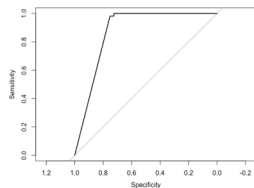


## CONDITIONAL PROBABILITIES – ABOVE AVERAGE

| | Cut | SE | SP | PPV | NPV | CC |
|---|---|---|---|---|---|---|
| Self-Awareness | .99 | .90 | .78 | .53 | .97 | .80 |
| Social Awareness | .99 | .93 | .74 | .58 | .97 | .80 |
| Self-Management | .99 | .94 | .76 | .55 | .98 | .80 |
| Relationship Skills | .99 | .90 | .81 | .62 | .96 | .83 |
| Responsible DM | .99 | .91 | .78 | .56 | .96 | .81 |
| Study Skills | .99 | .96 | .76 | .29 | 1.00 | .78 |
| Engagement | .99 | .90 | .77 | .34 | .98 | .79 |
| Motivation | .99 | .98 | .79 | .44 | .99 | .81 |

# DISCUSSION

13

## DISCUSSION

- DCM analyses suggested **items performed as intended**
  - Higher scores for individuals mastering more skills
- Strong evidence for **convergent validity**
  - Though some challenges related to discriminant validity
  - More to be done in this area – consider alternative criteria
- Strong evidence of **diagnostic accuracy** for all scales
  - All measures predicted the presence of both deficits and strengths

## IMPLICATIONS

**Practice**

- A way to determine if instruction is necessary at all
- Also a way to quickly place students into instructional groups once it's deemed necessary

**SOCIAL EMOTIONAL LEARNING**

**Research**

- Replicate with new samples – examine robustness of scoring approach
- Examine relative to alternative criteria
- Project timeline:
  - Year 2: Educator training
  - Year 3: Single-case design treatment utility studies
  - Year 4: RCT treatment utility study

## THANK YOU!!

- Stephen Kilgus: skilgus@wisc.edu
- Nate von der Embse: natev@usf.edu
- Katie Eklund: katie.eklund@wisc.edu

**WISCONSIN**
UNIVERSITY OF WISCONSIN–MADISON

**UNIVERSITY OF SOUTH FLORIDA**