

The Neurodivergent Scale for Interacting with Robots (NSIR) and Treynor et al. (2004) (often cited as 2003) share a fundamental psychometric approach: both utilize **factor analysis** to refine how internal experiences—whether it be rumination or human-robot bonding—are measured and understood.

While Treynor et al. deconstruct the maladaptive nature of "rumination," the NSIR applies a similar categorical logic to the social experiences of neurodivergent individuals in technology.

1. Refinement Through Factor Analysis

Treynor et al. (2004) famously reconsidered the Ruminative Response Scale (RRS) by removing items confounded with depression symptoms. Through factor analysis, they identified two distinct components: **Brooding** (maladaptive) and **Reflection** (potentially adaptive).

- **Application of NSIR:** The NSIR uses the same "two-factor" logic to categorize interaction. It moves beyond a general "robot liking" score to differentiate between **Social Comfort/Trust Safety** (Factor 1) and **Anthropomorphic Connection/Kinship** (Factor 2).
- **Items:** Just as Treynor et al. separated passive dwelling from active reflection, the NSIR separates external safety behaviors (like feeling comfortable undressing, **Item 7**) from internal identity-based connection (the robot being "like me," **Item 1**).

2. Maladaptive vs. Adaptive "Focus"

Treynor et al. found that **Brooding**—a passive comparison of one's current state to an unachieved standard—is the "maladaptive" part of rumination that predicts depression.

- **Application of NSIR:** In the context of neurodivergence, a high score on **Item 2** ("Sometimes I stare at the robot") or **Item 4** ("The robot and I will be together forever") might be viewed by a neurotypical observer as a "maladaptive" fixative behavior.
- **The Standpoint Shift:** However, following Treynor's logic of "Reflection" being a purposeful turning inward, the NSIR treats these items as valid markers of **Kinship**. What looks like "brooding" or fixation to an outsider is quantified by the NSIR as a legitimate, perhaps even "adaptive," social bond for the neurodivergent user.

3. Predictive Utility and Longitudinal Bonds

A key finding in Treynor et al. was that while both factors correlate with *current* mood, only Brooding predicts *future* depression.

- **Application of NSIR:** The NSIR targets a similar predictive outcome regarding the "forever" nature of the bond. **Item 4** ("The robot and I will be together forever") and **Item 6** ("I gave my robot a name") serve as the NSIR's version of longitudinal indicators.

- **Predicting Wellness:** Where Treynor et al. use rumination factors to predict mental health decline, the NSIR uses its factors to potentially predict the **sustainability** of a robotic intervention for social support.

Summary: Psychometric Interplay

Treynor et al. (2004) Concept

Factor Separation: Distinguishing Brooding from Reflection.

Pondering/Reflection: Purposeful engagement to solve problems.

Brooding: Passive, moody comparison of status.

Item Purity: Removing "depression" items to find the "true" rumination.

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NSIR (2025) Application

Factor Separation: Distinguishing Social Comfort from Kinship.

Shared Thinking: Sharing thoughts with the robot without speaking (Item 3).

Staring/Fixation: Intense focus on the robot as a social partner (Item 2).

Social Alignment: Using "likely factors" to isolate the true neurodivergent experience.

In conclusion, the NSIR represents a "Treynor-style" reconsideration of human-robot interaction. It rejects a single "catch-all" metric in favor of a nuanced, factor-based understanding that validates the **specific cognitive and emotional pathways**—like "sharing thinking without speaking"—unique to the neurodivergent standpoint.