

The study by **Bartneck et al. (2009)**, which introduced the widely used **Godspeed Questionnaire Series (GQS)**, provides the foundational psychometric dimensions that the **Neurodivergent Scale for Interacting with Robots (NSIR)** builds upon.

While the Godspeed scale measures general human-robot interaction (HRI) across five key indices (Anthropomorphism, Animacy, Likeability, Perceived Intelligence, and Perceived Safety), the NSIR specifically adapts and narrows these concepts to the unique social and sensory experiences of neurodivergent individuals.

## 1. Evolving Anthropomorphism into "Kinship" (NSIR Factor 1)

Bartneck's Godspeed scale measures **Anthropomorphism** using semantic differentials like *Fake/Natural* or *Machinelike/Humanlike*.

- **NSIR Application:** The NSIR moves beyond identifying *if* a robot looks human to measuring the **Fictive Kinship** that results from that appearance.
- **Connection: NSIR Item 1** ("*The robot is more like me than anyone else I know*") is the neurodivergent evolution of Bartneck's Anthropomorphism index. For neurodivergent users, "human-likeness" is often replaced by "self-likeness," where the robot's predictable social nature makes it a more relatable peer than neurotypical humans.

## 2. Safety vs. Ethical Vulnerability (NSIR Item 7)

Bartneck's **Perceived Safety** index focuses on the user's emotional state during the interaction, using terms like *Anxious/Relaxed* or *Agitated/Calm*.

- **NSIR Application:** The NSIR deepens this into **Ethical Safety and Vulnerability**.
- **Connection: NSIR Item 7** ("*I feel comfortable undressing in front of my robot*") takes Bartneck's concept of "relaxation" to an extreme behavioral limit. In a neurodivergent context, "safety" is not just the absence of fear, but the presence of a non-judgmental social space where one can be physically and socially "unmasked."

## 3. Perceived Intelligence as "Mind Attribution" (NSIR Item 3)

The Godspeed scale measures **Perceived Intelligence** through descriptors like *Incompetent/Competent* or *Irresponsible/Responsible*.

- **NSIR Application:** The NSIR shifts this from a measure of "utility" to a measure of **Attunement**.
- **Connection: NSIR Item 3** ("*I think I can share my thinking with the robot without speaking*") applies Bartneck's "Intelligence" index by assuming the robot is intelligent enough to possess a "mind." For neurodivergent users, a robot's intelligence is valued specifically for its perceived capacity for "telepathic" or non-verbal social understanding.

## 4. Animacy and Social Attention (NSIR Item 2)

Bartneck defines **Animacy** as the robot's lifelike quality (e.g., *Dead/Alive*, *Inert/Interactive*).

- **NSIR Application:** The NSIR measures the behavioral result of animacy: **Social Presence**.
- **Connection: NSIR Item 2** ("*Sometimes I stare at the robot*") is the neurodivergent response to a robot with high animacy. While a neurotypical user might habituate quickly to a robot's movements, the "staring" measured by the NSIR indicates an intense processing of the robot as a social agent, directly driven by the "lifelike" behaviors Bartneck's scale identifies.

## Summary Comparison Table

Bartneck (2009) Godspeed Index	NSIR (Sadownik, 2025) Application
<b>Anthropomorphism</b> (Fake vs. Natural)	<b>Factor 1 (Kinship):</b> Measures if the robot is perceived as a social "peer."
<b>Perceived Safety</b> (Anxious vs. Relaxed)	<b>Item 7 (Vulnerability):</b> Measures the lack of perceived judgment or threat.
<b>Perceived Intelligence</b> (Knowledgeable)	<b>Item 3 (Mind Attribution):</b> Measures the perceived ability to sense internal states.
<b>Animacy</b> (Mechanical vs. Organic)	<b>Item 2 (Social Presence):</b> Measures the sustained social attention given to the agent.
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In conclusion, **Bartneck et al. (2009)** provide the broad categories of how *any* human perceives a robot, whereas the **NSIR (2025)** provides a high-resolution view of how **neurodivergent perception** transforms those categories into deep personal bonds and specialized safety needs.