

# ***Revisiting the Double Empathy Problem: Communicative Mismatch Between Autistic People and Neurotypicals***

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**Abstract:** Previously, communication difficulties between autistic people and their non-autistic peers were attributed to the Theory of Mind deficit; an alternative model was proposed in the recent decade, arguing for a bidirectional breakdown in communication across neurotypes. By reviewing selected articles, empirical evidence favored the double empathy problem (DEP), suggesting both autistic and non-autistic people feel higher enjoyment when interacting with people of the same neurotypes. This review analyzed that autistic individuals rely less on facial expressions, directness of communication as well as better detail retention in written materials. However, researchers might want to incorporate autistic voices and explore the underlying mechanism of DEP to form a robust view. It is also important to create a neurodiverse world that can be beneficial for both autistic and non-autistic individuals.

**Keywords:** Autism, double empathy problem, social interaction, neurodiversity

## **1. Introduction**

Bidirectional communication challenges between autistic individuals and their non-autistic peers are characterized by difficulties perceiving each other's thoughts and emotions. Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental condition, highlighted by repetitive behaviors and narrow interests, along with challenges in social engagement [1]. According to the medical model [2], mutual misunderstanding is caused by autistic people's lack of Theory of Mind (ToM), the ability to interpret other people's mental status. Increasing studies take a neurodiversity perspective and explain difficulties in communication from a point that this is a communicative breakdown from both sides: not only do autistic people have difficulty understanding non-autistic individuals, but neurotypical struggling to capture autistic minds. However, a unified understanding of the underlying mechanism is still lacking [3].

This paper starts by examining the theoretical frameworks explaining communication barriers across neurotypes. Furthermore, this review deliberates on potential reasons for such misunderstandings and misinterpretations between minority autistic individuals and neurotypical individuals, followed by analyzing evidence from current DEP studies. We should note that DEP research is still in the early stages and scholars explore diverse social constructs and measurements in their studies. Developing reliable assessment tools for evaluating social interactions among individuals with varied neurotypes can be challenging. Third, this review sheds light on future directions toward a more robust investigation of DEP studies.

## **2. Theoretical Frameworks**

### **2.1. The ToM Deficit Model**

Over the past 40 years, researchers have attributed Theory of Mind (ToM) deficits to mismatches in communication across neurotypes. This idea was initially proposed by Baron-Cohen [4], who coined the term “mindblindness”, indicating that autistic individuals lack the necessary capacity to capture other people’s intentions and maintain reciprocal social communication. This model argues that autistic people experience delays in their ToM progress and display increased challenges in comprehending beliefs, emotions, and intentions during social interactions [5][6]. Extensive research has been done to decode variations in social behaviors and cognitions between autistic and non-autistic individuals and explain underlying mechanisms through ToM deficit theory [7]. However, Gernsbacher and Yergeau [8] found that over 75% of the top papers by Google Scholar contended that autistic people lack ToM but did not provide empirical evidence to support their argument.

### **2.2. The Double Empathy Problem**

Milton criticized the ToM deficit model, suggesting that such communication difficulties arise from mutual misunderstanding. He coined the concept of the double empathy problem (DEP) to emphasize a reciprocal lack of connection between two different social entities, specifically neuro minorities and their neurotypical peers [9]. The DEP theory disrupts the ToM deficit model by proposing that obstacles in social comprehension do not solely stem from deficits in autistic people. This notion is groundbreaking as it advocates for the removal of the deficit label from autistic individuals and proposes that a breakdown in interaction occurs due to challenges from both sides.

In recent years, there have been many DEP-pertained studies on autism, presenting evidence in support of this theoretical [10]. For example, one of the first empirical studies was from Crompton et al. [11], who utilized a diffusion chain approach to examine the exchange of information between individuals on the autism spectrum and those who are not, revealing that individuals with similar neurotypes effectively share information, but mixed chains showed a notable decrease in the transmission of specific details. In a similar vein, other studies also found that autistic people disclose more information to their autistic peers but encounter social uncomfortableness when communicating with their non-autistic families and friends [12].

### **2.3. Evidence for DEP**

At blush, some research found that autistic people share information effectively with other autistic individuals, just as the neurotypical group [11]. This claim is further supported by qualitative studies disclosing autistic voices [12]. Autistic participants replied in the interviews that they feel more comfortable maintaining social relationships as well as disclosing more about themselves with other autistic people but experience emotional fatigue and preference differences. This claim is supported by experimental feedback and daily experiences with their friends and families.

Previously, various studies discovered that information retention was relatively inadequate in mixed neurotype communication [11][13]. This implies that there are bidirectional challenges in mixed-group communication. Studies also yielded empirical evidence for reciprocal obstacles in communication between autistic and non-autistic individuals. For instance, in the research by Sheppard et al. [14], they observed that neurotypical individuals found it challenging to interpret autistic thinking; on the other hand, autistic individuals can comprehend the intentions of autistic peers with less effort. This proof aligns with the concept that mutual misinterpretation exists in social discourse. Another investigation concerning facial expression in communication [15] contends that

synchronization of smiling decreased rapidly in the diverse group. This foreshadows a decreased pleasure in social interaction.

Nevertheless, the non-autistic cohort felt superior in understanding autistic individuals, whereas autistic individuals encountered more difficulties in being understood by neurotypical peers. In the remaining studies, although participants completed self-report questionnaires in various investigations to gauge their satisfaction in conversation, there is a necessity for more precise scales to measure their emotional state or level of empathy after their interactions with fellow participants.

Despite the growing interest in DEP, it is crucial to acknowledge the absence of a formalized theory underpinning this cognitive phenomenon. This lack of theoretical foundation adds complexity to much of the DEP research that relies on a limited set of tasks to assess reciprocal communication between autistic individuals and those who are neurotypical. Therefore, DEP must undergo a thorough examination to inform research with a robust groundwork, enhance the clinical understanding of ASD, and contribute to an inclusive environment that embraces neurodiversity.

### **3. Autistic and Allistic People Communication Mismatch: Another Way of Being**

#### **3.1. Autistic Faces vs. Neurotypical Faces**

Research has investigated why autistic feel more enjoyment when interacting with other autistic peers and experiencing social affiliation with them. First, some studies on first impressions indicated that non-autistic people decreased their willingness to further interaction based on the very first encounter. Scholars attributed autistic people's less favorable social acceptance from neurotypical people to their expressive facial expressions and high-pitched voices. Faso et al. [16] examined how naïve observers rated emotions from autistic people and allistic adults in both posed and evoked conditions. Even though observers rated greater accuracy for autistic emotions but less naturalness, which inhibits further social interaction, despite those autistic emotions being correctly received by others. Hubbard et al. [17] used speech recordings of five divergent emotions from autistic males in controls, but only in neural emotions did autistic people betray natural expression. This finding suggested that their expressiveness and overstatement were related to emotional contexts; autistic are not good at faking out facial expressions in controlled settings.

However, converse evidence is that autistic people did not differ from their neurotypical peers in eye contact and skin conductance response at the statistic level, it was non-autistic people who felt uncomfortable in their interaction when eye gaze was avoided [18]. Collectively, research in this area identified that non-autistic people could perceive accurate emotions from autistic people but may view them as unnatural, which negatively impacts their willingness to continue relationships.

#### **3.2. Direction Communication vs. Indirection Communication**

Several studies have explored the reasons behind bidirectional communication challenges in neurotypical and autistic social interactions using language models. One potential explanation is that non-autistic individuals often use indirect communication in conversations. For instance, Katja et al. [19] examined how autistic adults interpret complex social situations by analyzing videos and providing narratives on social pragmatic and narrative discourse. Social-pragmatic inference involves understanding underlying meanings in interactions and interpreting nuances, such as jokes and sarcasm. The study found that autistic individuals tend to focus more on detailed facts rather than underlying meanings, which can lead to communication misunderstandings compared to non-autistic individuals. Another aspect is narrative discourse, which involves storytelling or describing events. Autistic individuals tend to emphasize details over a broader or holistic view of the story, showcasing differences in how they perceive the world.

Rifai et al. [20] further expand on this concept by arguing that autistic individuals independently perceive the world relying on their innate ideas and understand indirect meanings without relying on interpersonal interactions compared to non-autistic individuals who share language and understanding with others. This is supported by evidence showing that autistic individuals may face challenges due to difficulties integrating their internal cognitive processes with external social contexts. This mismatch contributes to their communication breakdown and potentially explains why autistic individuals may experience lower levels of enjoyment in social interactions, as seen in previous research.

### **3.3. Written Format vs. Oral Expression**

Other studies have used written communication methods that obscure facial expressions and voice and have found that autistic individuals excel at understanding and utilizing written formats. Research conducted using written materials, such as posts and literature reflections, has revealed that autistic individuals provide more intricate details in their reflections. For instance, in a study by Chapple et al. [21], participants were asked to read serious literature and non-fiction texts, simultaneously listening to audio recordings. They then completed reflective questionnaires and interviews. It found that autistic participants outperformed non-autistic individuals in their ability to grasp complex details and engage imaginatively with the literature material. On the other hand, non-autistic people took a general overview to capture the whole story. This contrasts with findings from Crompton et al.'s study [11], which showcased that autistic and non-autistic groups had similar levels of detail retention when retelling stories.

## **4. Caution Notes for Future Research**

### **4.1. Concept Clarification**

DEP studies are promising with a growing number of articles, but there are some gaps. It is important to define this concept clearly and we should be cautious not to conflate it with other social cognition concepts. Despite Milton's contribution to defining DEP in sociology, this concept remains ambiguous and requires further clarification. Empathy itself can be categorized into cognitive and affective (emotional) empathy, with the former focusing on understanding others' thoughts and perspectives, and the latter on sharing and understanding emotions. Research suggests that autistic individuals struggle more with emotional empathy than cognitive empathy [22], shedding light on studies investigating DEP.

Despite the "empathy" in the concept's title, only a few studies assess empathy using scales. Empathy quotient measurement was conducted by Clin & Kissine [18], revealing that neurotypical individuals scored twice as high as autistic peers, yet failing to elucidate the link between this measurement and experimental outcomes. Subsequently, Bagnall et al. [10] evaluated the Theory of Mind (ToM) through the Firth-Happe Animations Test, discovering no notable differences in ToM scores between autistic and non-autistic cohorts, implying similar capacities for lie. However, a higher score was associated with a greater inclination to lie, indicating that certain autistic individuals exhibit poorer deceitfulness and reduced lying speed. Additionally, Sheppard et al. [14] employed four adapted versions of the Mind Reading Belief Scale (MBS) due to its robust psychometric properties, thereby bolstering the instrument's reliability. The results derived from the MBS shed light on how autistic and neurotypical individuals perceive their mindreading abilities. Both groups perceived that individuals of the same neurotype better comprehend their thoughts.

Most studies in this field use questionnaires or self-report scales to assess participants' enjoyment in social interactions. However, the connection between social enjoyment and misunderstanding is often overlooked, with experiments typically focusing on simple conversation topics like self-

introductions in controlled settings. It is crucial to explore whether this enjoyment is linked to emotional empathy. In addition, autistic individuals may be more sensitive to environmental changes, making conversations with strangers different from their daily interactions and potentially impacting their emotional empathy. Future research should consider how various topics in daily discourse affect their understanding.

## 4.2. Measurement Tools

In the current research corpus of DEP, various social cognition abilities are linked to the DEP concept, such as mutual understanding, perspective-taking, and lying. According to Milton [23], DEP highlights the breakdown in shared understanding and the unique ways individuals with autism express themselves. However, DEP research has explored several related concepts, including misattunement and social affiliation. Studies in the collection assess a singular facet or stimuli in social concepts; forthcoming investigations may wish to explore multiple stimuli as both individuals with autism and those without autism encounter intricate scenarios in everyday social constructs.

"Jingle-jangle" measurement tools are utilized in DEP research to assess different social cognition constructs, adding complexity to the issue at hand. The first set of tools is evaluating social rapport and interaction between autistic individuals and non-autistic people. For instance, studies by Crompton et al. [11] and Rifai et al. [20] employ the diffusion chain method to evaluate communication within autistic, neurotypical, and mixed groups, involving a researcher initiating a story to the first person, who then passes it on to the next individual, with the accuracy of details as an indicator of their empathy levels. In alternative research, participants engage in informal conversations involving self-introductions and watching videos, discussing their experiences [11,13]. Participants then reported scores in their interaction with people of the same neurotype and different neurotypes. Other studies focus on rapport and analyze smile synchronization and eye gaze as social interaction signs across groups.

In addition to quantitative approaches, three studies in the selection combined qualitative methods such as interviews and surveys to examine friendship quality within and between diverse neurotypes. For instance, Cook et al. [24] utilize Qualtrics and the Friendship Questionnaire, incorporating questions such as preferences for in-person meetings versus online chats and discussing emotions versus practical solutions. Moreover, binary logistic regression is utilized to evaluate odds ratios. A similar methodology is adopted by Finke [25] and Crompton et al. [11], where researchers adopt an autistic perspective to explore the emotional aspects of their relationships with family and friends. Only one study [26] involves coding peer engagement, focusing on interactions between autistic adolescents and their non-autistic peers within a school club, coupled with qualitative analysis to identify patterns in environmental and interpersonal contexts.

The second set of studies measured social concepts other than social rapport. For example, Bagnall et al. [10] tested whether autistic individuals and neurotypicals differ in their lying behaviors and the underlying mechanism, utilizing a reaction-time examination of deception, theory of mind, and working memory assessment. This exploration deviates from the social interaction DEP studies by explicitly elucidating the interaction among those variables. Furthermore, Forbes et al. [27] delved into how autistic individuals and neurotypicals distribute money to individuals at increasing social remoteness to gauge generosity. Nevertheless, in contrast to prior beliefs that individuals with autism lack empathy, Forbes et al. [27] explored how individuals with autism assign value to money based on social discounting but determined that they exhibited heightened generosity compared to neurotypical individuals and were less influenced by social proximity in their monetary contributions. Another paper that delves into a distinct social concept and elucidates DEP is carried out by Sheppard et al. [14], who analyzed the convictions of how autistic individuals regarding their mindreading competence towards individuals with a similar neurotype and neurotypical individuals. Mindreading



abilities are linked to the capacity to grasp and construe the intentions of others. All three studies surpass the realm of interaction and further elucidate the mechanisms underlying social harmony and DEP.

### 4.3. Communication Challenges between Neuro Minorities and Neurotypical

DEP scholars should consider theory boundaries and parameters [3]. Despite DEP being associated with reciprocal social challenges among neuro-minorities and neurotypical individuals, the majority of studies focus on communication difficulties between autistic people and neurotypicals. First, several recent studies have focused on including autistic voices by incorporating autistic researchers in their question design. An innate perspective can be seen through incorporating feedback from autistic individuals. Since DEP involves communication breakdown in interactions between different neurotypes, researchers need to include autistic perspectives in decoding autistic data. Second, autism varies individually, accompanied by various degrees of language impairments, intellectual difficulties as well and co-occurring conditions. Some autistic people also experience comorbid conditions that can significantly influence their daily social interactions. Only some studies eliminate the influence of social anxiety and other co-occurring conditions such as alexithymia, ADHD/ADD, physical disabilities, and other medical conditions. These studies often fail to consider that autism is often related to other comorbidities such as ADHD and other mental health issues, highlighting the need to clarify these co-occurring conditions when recruiting autistic participants. Milton [24] argues that DEP represents a mismatch between individuals of different neurotypes and suggests that future research should explore communication between different neuro-minorities or between neurotypical and neurodiverse individuals.

## 5. Conclusion

It is crucial to understand how autistic individuals are perceived by neurotypical individuals in communication. While the current review focuses on a limited number of articles, there has been a growing number of studies on DEP in recent years. Social communication plays a significant role in the daily lives of autistic individuals and can impact their mental health in the long term. From the reviewed articles, we can conclude that autistic people shared a higher level of enjoyment in communicating with people from the same neurotype just as neurotypicals. This might be a result of their preference for a direct way of communication. Autistic people are more willing to decide on future relationships regardless of the first encounter, which might explain their increased satisfaction in communicating with their autistic peers. In addition, studies conducted using empathy scales revealed that autistic people are less accomplished in the oral form of communication compared to the written format. There are significant differences in social communication between autistic people and non-autistic people. Excluding autistic individuals from social interactions can be detrimental to both autistic individuals and neurotypical individuals, highlighting the importance of creating an inclusive world that welcomes neurodiversity.

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