Personality and Individual Differences 257 (2026) 113757

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Perceiving minds, not objects: How Theory of Mind inhibits objectification in social relations

Giuseppe Raguso [a,*], Cristina Baldissarri [b], Chiara Pecini [a], Mara Turi [a], Gian Antonio di Bernardo [c], Luca Andrighetto [a]

[a] Department of Educational Science, University of Genova, Italy
[b] Department of Psychology, University of Milano-Bicocca, Italy
[c] Department of Education and Human Sciences, University of Modena and Reggio Emilia, Italy

ARTICLE INFO

Keywords:
Theory of mind
Objectification
Interpersonal relations
Training

ABSTRACT

Despite the growing literature documenting the pervasiveness of objectification in today's interpersonal exchanges, no studies have yet analyzed possible inhibitors. Through three preregistered studies and one intervention (N_{tot} = 813), we proposed Theory of Mind (ToM) – in its cognitive and affective dimensions – as a socio-cognitive skill that can counteract interpersonal objectification.

Beyond assessing individual ToM levels (Studies 1, 2, 3), we activated it by exposing participants to multimedia stimuli (Studies 2a, 2b) triggering thoughts and emotion recognition. Additionally, we trained ToM through a one-month intervention program involving school-aged children (Study 3).

Overall, our findings documented a consistent negative association between ToM levels and various indicators of interpersonal objectification. While temporary ToM activation did not decrease objectification, structured ToM training was found to be particularly effective in inhibiting this tendency. Finally, a distinct impact of cognitive vs. affective ToM did not clearly emerge, highlighting methodological issues when assessing these dimensions separately.

1. Introduction

Healthy social relationships are vital for individuals and their social well-being (Wilkinson & Pickett, 2009). Yet, history is rife with instances where dignity is neglected in favor of personal gain. In modern capitalist societies, economic success is often prioritized over human values, fostering socioeconomic inequality (Wilkinson & Pickett, 2019). Living in such environments profoundly influences people's way of thinking, fostering a calculative mindset, where relationships are seen in terms of costs and benefits (Cheng et al., 2024). Such a mindset fosters objectification, a prevalent form of dehumanization, in which others are treated as mere tools for personal goals (Nussbaum, 1995).

So far, many theoretical and empirical works revealed the pervasiveness of objectification (see e.g., Gervais et al., 2013), highlighting how it manifests in specific intergroup contexts as well as in daily interpersonal relations. Most of these studies have focused on the triggers and consequences of this process, highlighting its impact on self-perception and well-being. However, much less is known about what might inhibit this process. The present research aims to address this important lacuna, by proposing Theory of Mind (ToM) as an individual skill that counteracts objectification in social interactions.

1.1. Antecedents and consequences of interpersonal objectification

Although objectification is a multifaceted phenomenon (Nussbaum, 1995), its primary dimensions are instrumentality (i.e., viewing others as tools for achieving goals) and the denial of human mental states (viewing others as mindless entities; Vaes et al., 2014).

Objectification has been traditionally studied as anchored to the sexual context (see e.g., Pecini et al., 2023 for a review) or, more recently, to the workplace, where specific features of the work (e.g., task repetitiveness) lead workers to self-perceive more as mere instruments than humans (see Baldissarri et al., 2022 for a review). However, objectification can manifest in various contexts, also in everyday social relations. In this regard, interpersonal objectification refers both to people's tendency to objectify the relationship (i.e., to perceive it in

* Corresponding author at: University of Genova, Corso Podestà 2, Italy.
E-mail address: giuseppe.raguso@edu.unige.it (G. Raguso).

https://doi.org/10.1016/j.paid.2026.113757
Received 15 April 2025; Received in revised form 27 February 2026; Accepted 28 February 2026
Available online 9 March 2026

instrumental terms) and other people, that is, to exclusively focus on their goal-related characteristics, deny their humanity, and perceive them as an object rather than a human being (Giacomantonio et al., 2025).

This form of objectification is shaped by contextual and individual variables. Specifically, socioeconomic inequality (Cheng et al., 2024), salience of money (Vohs, 2015), and power asymmetry (Gruenfeld et al., 2008; Guinote, 2017) increase psychological distance and foster instrumental views of others. Additionally, uncertainty in social interaction may promote objectification by providing an illusory sense of control (Landau et al., 2012) and, more recently, Jiang et al. (2024) found that time pressure increased agentic orientation and reduced spontaneous consideration of others' mental states, thereby increasing objectification.

From an individual perspective, Dark Triad traits (Schimmenti et al., 2019), low openness (Lachowicz-Tabaczek et al., 2025) and attachment avoidance (Ecer et al., 2026) relate to a higher tendency to treat others instrumentally. Furthermore, Ozimek et al. (2017) found that individuals with strong materialistic tendencies treated their online friends as digital "possessions" aimed at enhancing social success. Objectification in social relations has deep detrimental consequences for individuals and interpersonal relations. For example, being treated as a tool by colleagues or classmates leads to diminished authenticity and well-being (Cheng et al., 2022). Moreover, objectified individuals exhibit reduced prosocial intentions (Zhang & Chen, 2024), and objectification often triggers interpersonal aggression (Poon et al., 2020).

Taken together, these findings shed light on the antecedents and consequences of objectification, but the factors that may help prevent it remain largely unexplored and constitute the focus of this work.

1.2. Theory of Mmind as inhibitor of interpersonal objectification

A key aspect in recognizing the humanity of others lies in the ability to understand their thoughts and emotions. The comprehension of others' cognitive (e.g., thoughts) and affective (e.g., emotions) states, i.e. ToM, lies at the core of constructing any human relationship and is crucial for human well-being, enabling individuals to predict others' behaviors and act appropriately (Wimmer & Perner, 1983). ToM is an articulated system commonly conceptualized within dual-component and multidimensional models of social cognition (Decety & Jackson, 2016; Shamay-Tsoory & Aharon-Peretz, 2007). These frameworks mainly distinguish between cognitive ToM, involving the inference of others' beliefs and intentions (Shamay-Tsoory & Aharon-Peretz, 2007), and affective ToM, referring to the capacity to recognize others' emotions, facilitating emotional responses (Ramezani et al., 2020). Although these two dimensions seem to be connected to different brain networks, recent studies suggest that in more complex social situations, the cognitive and affective components work together in a complementary manner (Schurz et al., 2021), making their empirical distinction particularly challenging.

Despite literature on ToM primarily focused on its development in childhood (e.g., Gopnik & Wellman, 1992) or its impairment in clinical samples (e.g., Sprong et al., 2007), recent research views ToM as an individual difference also among non-clinical populations (see e.g., Conway et al., 2019). Although there is ongoing debate about the ability of current measures to fully capture the entire variability of ToM capacities (Yeung et al., 2023), existing studies suggest that this skill significantly shapes, along with the cognitive domain, attitudes and behaviors in social interactions. Most of these studies focus on childhood, demonstrating that a well-developed ToM is associated with more cooperative or prosocial behaviors (see Imuta et al., 2016 for a review) and greater endorsement of fairness norms (Tsoi & McAuliffe, 2020). Comparatively, less research has explored ToM's role in non-clinical adults' social relations, indicating a need for further studies (Apperly et al., 2009). Some evidence suggests that, similar to children, adults with better mindreading abilities (i.e., higher levels of ToM) tend to be more cooperative (Paal & Bereczkei, 2007) and prosocial (Spenser et al., 2020). Moreover, well-developed ToM abilities in adults are linked to enhanced social skills (McGarry et al., 2021), predict greater well-being in romantic couples (Dodell-Feder et al., 2016), and contribute to a more heterogeneous social network (Krendl et al., 2022).

These prosocial correlates of ToM point toward a potentially broader protective function, namely, its capacity to counteract interpersonal objectification. If objectification entails a denial of others' minds, reducing them to functional instruments lacking psychological depth, then ToM — as the very capacity to recognize others as intentional, minded agents — represents its cognitive and moral opposite. This contrast finds direct support in neuroscientific evidence: Harris and Fiske (2009) demonstrated that when others are perceived as inferior or instrumental, activity in the medial prefrontal cortex — a key region implicated in ToM — markedly decreases, suggesting that objectification corresponds to a suspension of mind recognition. Conversely, the activation of ToM-related neural circuits reinstates the perception of others as minded subjects (Gan et al., 2024). At the behavioral level, perceiving another agent as having a mind is central to attributing humanity, rights, and moral concern to them (Waytz et al., 2010), such that ToM operates as both a cognitive and moral barrier against instrumentalization. Further substantiating this link, Di Bernardo et al. (2025) indicated that higher levels of sexual self-objectification were associated with diminished ToM-related capacities, with self-dehumanization mediating this relationship, converging with the neuroscientific evidence in suggesting that objectification and mind attribution are mutually inhibitory processes.

Beyond mind recognition, ToM also inhibits objectification through its relational and prosocial effects. Recognizing others' thoughts and emotions fosters interpersonal closeness and moral regard (Fiske, 2009), promoting social connection and relational engagement — processes fundamentally incompatible with the instrumental stance that characterizes objectification. This dynamic has direct empirical support: Cogoni et al. (2018) found that women portrayed in objectifying contexts elicited reduced activation in brain regions associated with mentalizing compared to personalized contexts, suggesting that objectification operates through a spontaneous diminishment of mind attribution — and, crucially, that restoring mentalizing can reverse this process. Complementing this, Majdandžić et al. (2016) demonstrated that engaging in mentalizing promotes prosocial behavior even toward dissimilar individuals — precisely those most vulnerable to objectification.

Extensive research has also demonstrated that ToM can be improved in several ways. Particularly among children, training programs have proven effective in enhancing ToM, showing that systematic exposure to conversations rich in references to others' thoughts and emotions supports the recognition and understanding of self and others (Dunn & Brophy, 2005). In parallel, research has shown that ToM skills can also be increased in adults and older adults through conversation-based ToM training (Cavallini et al., 2021), mindfulness meditation (e.g., Tan et al., 2014) and reading literary fiction (Kidd & Castano, 2019). Additionally, ToM can be stimulated, at least in the short term, through multimedia material. For instance, Hortensius et al. (2021) documented that exposing people to scenes of animated films triggering mentalizing activates the ToM brain network, while Castano (2021) found that participants who viewed art films (vs. Hollywood films) performed better on subsequent ToM measures.

Across our studies, after testing the relation between ToM and interpersonal objectification, we incorporate various empirical approaches aimed at activating or training this skill to provide a comprehensive understanding of this link.

1.3. Overview of hypotheses and studies

Our main hypothesis posits that ToM serves as a key mechanism for counteracting the tendency to adopt objectifying behaviors in social

interactions. As outlined in the previous section, this assumption is grounded in the very nature of the two constructs considered. Objectification, like other dehumanizing processes (Haslam, 2006), entails a denial or attenuation of the other's mind, reducing individuals to entities defined primarily by their instrumental value. By contrast, ToM is the capacity that enables the recognition of others as intentional agents endowed with complex mental states. Thus, activating ToM should directly counteract the cognitive mechanisms that make objectification possible, reinforcing the perception of the other as a fully human individual.

To test this main hypothesis, we first sought to outline a negative correlation between individual levels of ToM and objectification (Study 1). Then, we examined the causal relationship between these variables by experimentally stimulating ToM in adults (Study 2a & 2b) or enhancing it in school-aged children through a specific training program (Study 3) and assessing its effect on reducing objectification.

We also examined the distinct effects of the cognitive and affective dimensions of ToM. Although we expected both to inhibit objectifying tendencies, we hypothesized that the affective dimension would have a stronger impact. Specifically, we assumed that understanding others' emotions plays a crucial role in fostering the emotional bond described earlier, thereby making the emergence of objectifying tendencies even less likely than understanding their mental states.

Regarding the operationalization of interpersonal objectification, so far research conceptualized and assessed this construct in different ways, from perceiving others as lacking mental states (e.g., Wang & Krumhuber, 2017, Study 4), or resembling an object rather than a human being (i.e., objectification of the other; Andrighetto et al., 2017), to focusing on the goal-oriented characteristics of the other (e.g., Landau et al., 2012; Teng et al., 2016), and perceiving the relationship in instrumental and utilitarian terms (i.e., objectification of the relation; Lachowicz-Tabaczek et al., 2021). To ensure generalizability, we investigated interpersonal objectification by considering its different conceptualizations: the tendency to perceive (Study 1, 2a & 2b) or treat (Study 3) the others in social relations as objects, to objectify the social relations (Study 1, 2a & 2b, 3), or to focus on the goal-characteristics of the other (Study 2a & 2b).[1]

2. Study 1

Study 1 provided correlational evidence about the link between ToM and interpersonal objectification, assessed as the tendency to objectify relations and to perceive others as objects (vs. human beings) in everyday interpersonal exchanges. Accordingly, we hypothesized that the higher the ToM levels, the lower their tendency to objectify the social relations (*Hp 1a*) and to perceive others as objects (*Hp 1b*). In parallel, we aimed at verifying the distinct impact of cognitive and affective ToM dimensions. In doing so, we employed the Yoni Task (Shamay-Tsoory & Aharon-Peretz, 2007) and the ToM Inventory (Hutchins et al., 2021), both capturing these two main facets of ToM. In addition and to provide more robustness for the hypothesized link, we also considered the Reading the Mind in the Eyes Task (RMET; Baron-Cohen et al., 2001).

The second hypothesis of this study posits that both cognitive and affective dimensions would negatively correlate with both measures of interpersonal objectification (*Hp 2a*), but that the affective dimension would show a stronger negative association with objectification compared to the cognitive dimension (*Hp 2b*).

2.1. Method

2.1.1. Participants

For this and subsequent two studies, our goal was to reach a heterogeneous sample of participants by age and socio-cultural background. To this end, research assistants recruited participants using a snowball sampling procedure. We followed Schönbrodt and Perugini (2013), who suggest that approximately 250 participants offer sufficient statistical power for similar cross-sectional studies. We recruited 405 participants. However, 96 were excluded due to incomplete participation (failure to respond to one or more scales) and 9 for inaccurate responses to the two attentional check items (see Oppenheimer et al., 2009). The final sample comprised 300 participants (174 women, 121 men, and 5 preferred not to answer; $M_{age} = 29.92$, age range = 18–81; $SD = 14.50$; further details on participants' demographics for this and subsequent studies are available in the Supplementary Materials).[2]

2.1.2. Procedure and materials

All participants were presented with an online survey, which included the measures described below, presented in a random order among the participants.

2.1.2.1. ToM measures. Given the extensive variety of instruments currently available in the literature potentially capturing different nuances of ToM levels, it was decided to consider multiple measures, including two tasks and a self-report measure. First, we employed the Italian version (Vellante et al., 2013) of the RMET (Baron-Cohen et al., 2001): participants viewed 36 images showing only the eye region of actors and actresses and chose which of four emotions best matched each photo. The final score, given by the total number of correct responses, indexed their accuracy in recognizing others' affective states.

The subsequent measures were used to detect the cognitive and affective dimension of ToM separately. The *Yoni Task* (see Isernia et al., 2023 for the italian version) was composed by 48 stimuli which were presented increasing in difficulty. In each trial, an animated character directed his gaze toward different targets (e.g., objects, people) displaying varying facial expressions. For each stimulus, participants selected, from four options, the thought (cognitive ToM) or emotion (affective ToM) they believed the character expressed. Two indexes, cognitive and affective ToM, were computed as the sum of correct responses, with higher scores indicating greater accuracy in identifying others' mental and emotional states. In our sample, mean overall accuracy was 0.77, which falls below the Italian normative mean of 0.85 reported for healthy adults (Isernia et al., 2023), indicating the absence of a ceiling effect.

Finally, an ad hoc Italian adapted version of *ToM Inventory* (Hutchins et al., 2021) was used to detect the self-report levels of cognitive and affective ToM. It included 28 items ($\omega = 0.91$), with 14 items assessing the cognitive dimension of ToM (e.g., "If it were raining and someone said, 'Looks like a beautiful day outside!', I would understand that they don't really think it's a beautiful day.") and 14 items evaluating the affective dimension ("I can put myself in other people's shoes and understand how they feel"). Participants rated their agreement with each statement on a 7-point Likert scale (1 = "*not at all*"; 7 = "*completely*"), so that the higher the scores, the higher their levels of self-report cognitive and affective ToM.

2.1.2.2. Interpersonal objectification measures. The 10-item (1 = "*strongly disagree*"; 7 = "*strongly agree*") *Relations' Objectification Scale*

[1] Study 1, 2a and 2b original projects and preregistrations included additional hypotheses about the relationship between objectification and other personality traits like the Dark Triad (Study 1, 2a, 2b) and need for cognitive closure (Study 2a). Since these hypotheses and the related analyses were not central to the main research focus, they have not been included in the main text but are detailed in the Supplementary materials, along with a brief note discussing the limitations of the measure used to assess the Dark Triad.

[2] The datasets and the materials of the studies are available through Open Science Framework (https://osf.io/yvcbm/?view_only=d8127ea731ff4474851307883372f57a).

(Lachowicz-Tabaczek et al., 2021) was used to assess the people's general tendency to perceive the interpersonal relations in an instrumental way (ω = 0.80; e.g., "I tend to contact other people only when I need something from them"; "I evaluate other people based on their usefulness to me"). Participants gave their answers, with higher scores indicating higher levels of objectification of the relations.

The *Others' Objectification Scale* (Andrighetto et al., 2017) was instead employed to assess individuals' tendency to perceive others as objects during the interpersonal exchange. Participants were asked to rate on a 7-point Likert scale (1 = "*not at all*"; 7 = "*completely*"), the extent to which they perceived the people they interact with daily in various life domains to resemble 12 nouns (ω = 0.89): 6 nouns referred to objects (e.g., thing, tool) and 6 to people (e.g., human, citizen). Separate scores were computed for each category, then combined by subtracting the human score from the object score, with higher values indicating a stronger tendency to objectify others.

At the end of the survey, participants were asked to respond to some socio-demographic questions (age, gender, nationality, income and politics) and were appropriately debriefed and thanked.

2.2. Results

Confirmatory factor analyses (CFA) did not confirm the two-dimensional structure of the ToM Inventory (Cognitive vs. Affective). Thus, for this and subsequent studies the scale was considered as unifactorial (see Supplementary materials for the CFA results). Table 1 reports correlations among variables. Confirming *Hp 1a* and *b*, negative association between the ToM measures and both scores of interpersonal objectification emerged: the RMET, ToM Inventory, and Yoni Task—both cognitive and affective scores—were all negatively correlated with the participants' tendency to objectify others and interpersonal relations, with effect sizes ($|r| = 0.17$–0.24) falling within the small-to-medium range (Funder & Ozer, 2019).

To test *Hp 2a* and *2b*, we conducted two linear regression models in which the cognitive and affective dimensions of ToM, as measured by the Yoni Task, served as predictors, while the outcome variables were the two measures of objectification: Relations' objectification in Model 1 and Others' objectification in Model 2. Participants' age and gender were included as control variables. The overall models were all significant (Model 1: $F(4,295) = 8.43$, $p < .001$, $R^2 = 0.103$; Model 2: $F(4,295) = 4.04$, $p = .003$, $R^2 = 0.052$) but results showed that, if considered together, only cognitive ToM – but not affective ToM – was negatively correlated with both measures of interpersonal objectification (see Table 2).

Overall, findings of Study 1 confirm our first hypothesis: a significant negative correlation between ToM and interpersonal objectification emerged, that was observed using both task-based and self-report measures of ToM, as well as different indexes of interpersonal objectification – objectification of relationships and objectification of others. Instead, findings emerged when looking at the two dimensions of ToM did not show a stronger effect of affective ToM, thus not allowing us to confirm *Hp 2,* at least when considering the Yoni Task indexes.

3. Study 2a

Study 2a and b were designed to replicate and extend the findings of Study 1. Given the correlational nature of Study 1, here we sought to establish the causal direction of the investigated relationship, by experimentally manipulating ToM and its dimensions and then observing their effects on interpersonal objectification. In doing so, we grounded on recent empirical literature showing that the ability to understand others' cognitive and emotional states can be either stimulated (e.g., Bowes & Katz, 2015) or inhibited (Mahy et al., 2014). In Study 2a, participants watched an animated film designed to activate ToM networks (Hortensius et al., 2021). Depending on condition, their attention was directed either to the characters' emotions (affective ToM) or intentions (cognitive ToM). These were compared with a control condition in which participants viewed neutral multimedia content of similar length. Then, the effects of stimulated ToM on interpersonal objectification were assessed. Importantly, besides the measures of objectification of the relation and the other used in the previous study, we also considered a partner selection task (Teng et al., 2016; Wang & Krumhuber, 2017) that assessed people's tendency to focus on goal-related characteristics of a given interactant. We preregistered the following hypotheses: both experimental conditions would lead to decreased interpersonal objectification across the considered measures when compared to the control condition (*Hp 1*); these effects would be stronger for participants assigned to stimulation of affective than cognitive ToM (*Hp 2*). Crucially, we validated these hypotheses by controlling for participants' individual ToM levels, assessed before the experimental manipulation.

3.1. Method

3.1.1. Participants and experimental design

A priori power analysis conducted using G*Power software ($f = 0.25$, power = 0.80, alpha = 0.05) indicated a minimum sample size of 196 participants for conducting variance analyses across three independent groups. Of 301 participants recruited 103 were excluded due to incomplete responses or errors in attentional check items (see Study 1), leaving a final sample of 197 participants (132 women, 63 men and 6 preferred not to answer; $M_{age} = 28.88$ years, $SD = 12.17$, age range = 19–64), who were randomly assigned to one of three conditions: cognitive ToM activation vs. affective ToM activation vs. control.

3.1.2. Procedure and materials

The study was conducted online and divided into two main phases. In the first one, along with sociodemographic variables (age, gender, nationality and income), individual ToM levels were assessed through the same adapted version of the ToM Inventory (Hutchins et al., 2021) used in Study 1, considering it as an overall index (ω = 0.91).

In the second phase, conducted at least 72 h after the first to reduce the salience of the initial ToM assessment, participants received a link that randomly assigned them to one of three conditions and led them to the experimental task. The first two groups watched the same 5-min video clip used by Hortensius et al. (2021) to activate ToM brain

Table 1
Correlation matrix for variables. Study 1.

		M	*SD*	1	2	3	4	5
1	Reading the mind in the eyes task	23.86	3.71	–				
2	Yoni task - Cognitive	16.03	4.47	0.22***	–			
3	Yoni task - Affective	16.25	3.95	0.24***	0.74***	–		
4	ToM Inventory	4.99	0.62	0.15**	0.03	0.03	–	
5	Relations' Objectification	2.31	0.80	−0.20***	−0.19**	−0.16**	−0.24***	–
6	Others' Objectification	−3.67	1.70	−0.20***	−0.20***	−0.17**	−0.24***	0.38***

Note.
** $p < .01$
*** $p < .001$.

Table 2
The effects of cognitive and affective ToM, measured by the Yoni Task, on the objectification measures. Study 1.

				95% Confidence Interval			
Dependent variables	Predictors	Estimates	SE	Lower	Upper	*t*	*p*
Relations' Objectification							
	Intercept	−0.17	0.07	−0.312	−0.032	−2.41	0.017
	Yoni Task - Cognitive	−0.17	0.08	−0.331	−0.005	−2.02	0.044
	Yoni Task - Affective	−0.03	0.08	−0.197	0.129	−0.41	0.682
	Gender	0.43	0.11	0.205	0.647	3.79	<0.001
	Age	−0.16	0.05	−0.261	−0.043	−2.76	0.006
Others' Objectification							
	Intercept	−0.08	0.07	−0.224	0.065	−1.09	0.279
	Yoni Task - Cognitive	−0.17	0.09	−0.342	−0.006	−2.04	0.042
	Yoni Task - Affective	−0.04	0.09	−0.204	0.131	−0.43	0.666
	Gender	0.20	0.12	−0.030	0.424	1.71	0.089
	Age	−0.00	0.06	−0.112	0.112	−0.01	0.994

Note. All values are standardized (*Z*-scores). Gender was codified as follows: 1 = Male, 2 = Female.

networks, the animated film "Party Cloudy" (URL: https://vimeo.com/831591078). The procedure was adapted for this study. Depending on the condition, participants were instructed to focus on either the characters' mental states (cognitive ToM activation) or their emotions (affective ToM activation) before watching the video. To reinforce the manipulation, participants then answered a brief open-ended question aligned with their condition, asking them to describe either the characters' thoughts (cognitive ToM activation) or their feelings (affective ToM activation). In the control condition, participants viewed a 5-min documentary about a European capital and answered basic summary questions.

After the manipulation, interpersonal objectification was assessed with a fictional TV quiz–show scenario in which participants chose between two potential partners: one described with social–emotional traits (partner A) and one with quiz-related skills (partner B; see Teng et al., 2016; Wang & Krumhuber, 2017). Participants indicated their preference on a slider from 1 (partner A) to 7 (partner B), with greater preference for partner B, reflecting higher interpersonal objectification, here operationalized as focusing on goal-related characteristics. Furthermore, we assessed the participants tendency to objectify through the Relations' objectification scale (ω = 0.87) and Others' objectification scale (ω = 0.87) as in Study 1.

3.2. Results

We conducted a MANCOVA with the three-level experimental condition (cognitive ToM, affective ToM, control) as the predictor, the partner choice and the two interpersonal objectification measures as dependent variables, and individual ToM levels, gender, age, and perceived involvement and pleasantness toward the video as covariates. Results indicated no effects of the condition, $\lambda = 0.99$, $F(6,370) = 0.31$, $p = .930$, $\eta_p^2 = 0.005$ and univariate tests similarly revealed no significant effects of the condition on the three dependent variables (Table 3). Contrary to our hypotheses, participants in the two ToM conditions exhibited similar levels of interpersonal objectification to those assigned to the control condition. The effect of the covariates was not significant either ($Fs \leq 2.05$, $ps \geq 0.108$), except for individual levels of ToM, $\lambda = 0.95$, $F(3,185) = 2.89$, $p = .037$, $\eta_p^2 = 0.045$, which, consistent with the findings from Study 1, was negatively related with objectification measures.

To examine whether the (null) effect of ToM activation on objectification measures might be influenced by individual differences in stable ToM levels, moderation analyses were conducted. The cognitive (Dummy 1) and the affective (Dummy 2) ToM activation condition were treated as predictors, with individual ToM levels as the moderator, and the partner's choice, relationship objectification, and others' objectification as the dependent variables. The findings confirmed that the conditions exerted no significant effect neither on the partner's choice, nor on the two measures of interpersonal objectification, while individual ToM levels showed a significant negative direct effect on objectification, at least when considering the others' objectification measures (see Table 4).

Results of Study 2a did not confirm our hypotheses: neither cognitive nor affective ToM activation reduced any measure of interpersonal objectification. Instead, as in Study 1, individual levels of ToM, assessed well before the subsequent ToM activation, significantly inhibited the objectification of others. Although this effect emerged for only one measure of interpersonal objectification, it provides initial insights into the potential prevalence of individual and dispositional ToM levels in reducing objectification over their situational activation. However, since this difference may also result from the ineffectiveness of manipulation in activating and maintaining this capacity during subsequent tasks, Study 2b aimed to replicate this study using a different experimental manipulation, varying in both length and multimedia material.

4. Study 2b

The video clip used to stimulate ToM in Study 2a was of short duration (5 min) and featured non-human and imaginary characters, possibly weakening the efficacy of ToM activation. To overcome these

Table 3
Mean ratings of objectification measures depending on experimental conditions. Study 2a.

				Conditions					
				Cognitive ToM activation		Affective ToM activation		Control	
Measures	*F*(3,185)	*p*	η_p^2	*M (SD)*					
Partner's choice	0.24	0.789	0.003	3.94	(2.36)	3.92	(2.19)	4.10	(2.27)
Relations' objectification	0.67	0.511	0.007	3.30	(1.08)	3.24	(1.02)	3.31	(0.88)
Others' objectification	0.67	0.513	0.007	−3.38	(1.85)	−3.52	(1.75)	−3.60	(1.78)

Note. Higher scores on *partner's choice* measure indicate preference for the more instrumental partner (Partner B), thus reflecting greater objectifying orientations.

Table 4
Regression analyses considering individual ToM levels as the moderator. Study 2a.

				95% Confidence Interval			
Dependent variables	Predictor	Estimates	SE	Lower	Upper	*t*	*p*
Partner's choice	Intercept	−0.00	0.072	−0.142	0.142	−0.002	0.998
	Cognitive ToM activation	−0.05	0.086	−0.219	0.120	−0.58	0.565
	Affective ToM activation	−0.05	0.086	−0.221	0.120	−0.59	0.559
	Individual ToM levels	0.02	0.074	−0.129	0.162	0.22	0.824
	Cognitive ToM activation × Individual ToM levels	0.01	0.089	−0.166	0.183	0.01	0.922
	Affective ToM activation × Individual ToM levels	0.03	0.087	−0.143	0.199	0.32	0.746
	Age	−0.11	0.076	−0.258	0.040	−1.44	0.152
	Gender	0.04	0.073	−0.107	0.181	0.50	0.615
Relations' objectification	Intercept	−0.001	0.072	−0.143	0.141	−0.01	0.991
	Cognitive ToM activation	−0.002	0.086	−0.172	0.168	−0.02	0.981
	Affective ToM activation	−0.02	0.087	−0.194	0.148	−0.27	0.791
	Individual ToM levels	−0.08	0.074	−0.226	0.066	−1.08	0.280
	Cognitive ToM activation × Individual ToM levels	0.07	0.089	−0.103	0.246	0.81	0.421
	Affective ToM activation × Individual ToM levels	−0.01	0.087	−0.181	0.162	−0.11	0.911
	Age	0.001	0.076	−0.148	0.151	0.02	0.988
	Gender	−0.02	0.073	−0.167	0.122	−0.31	0.758
Others' objectification	Intercept	0.000	0.070	−0.139	0.139	0.000	0.000
	Cognitive ToM activation	0.06	0.084	−0.106	0.226	0.71	0.477
	Affective ToM activation	0.01	0.085	−0.161	0.173	0.08	0.940
	Individual ToM levels	−0.20	0.072	−0.344	−0.059	−2.80	0.006
	Cognitive ToM activation × Individual ToM levels	0.02	0.087	−0.155	0.187	0.19	0.854
	Affective ToM activation × Individual ToM levels	−0.08	0.085	−0.250	0.085	−0.97	0.335
	Age	−0.06	0.074	−0.201	0.091	−0.74	0.461
	Gender	−0.05	0.072	−0.189	0.093	−0.67	0.505

limitations, in Study 2b we employed a similar procedure, but in the experimental phase participants were exposed to a 20-min excerpt from a dramatic live-action film with real human characters.

4.1. Method

4.1.1. Participants, procedure, and materials

The same minimum sample size of Study 2a was considered. Of the 250 participants recruited, 21 were excluded for incomplete responses, leaving a final sample of 229 participants (115 women, 109 men, and 5 preferred not to answer, average age of 28.72 years, $SD = 13.72$, age range = 18–74).

The procedure was identical to Study 2a: participants first completed the ToM Inventory ($\omega = 0.92$), and, after a 72-h interval, were exposed to the experimental manipulation. ToM activation involved a clip from the film "Bright Star" (URL: https://vimeo.com/850209302?share=copy), chosen for its effectiveness in stimulating ToM abilities (Castano, 2021). After watching the video, participants completed the same imagined scenario and interpersonal objectification measures as in Study 2a, assessing their preference for a partner with goal-related (vs. emotional) traits, and their tendency to objectify relationships ($\omega = 0.81$) and others ($\omega = 0.91$). To more accurately capture objectification tendencies, participants responded to the two objectification measures twice: first in relation to their own relationships and others in general, and then in relation to the partner they selected in the TV quiz scenario (Relation's objectification scale related to the selected partner, $\omega = 0.86$; Partner's objectification scale $\omega = 0.90$).

4.2. Results

As in the previous study, our hypotheses were tested with a MANCOVA. Results were similar to those of Study 2a, as they indicated no effect of the condition, $\lambda = 0.97$, $F(10,436) = 0.65$, $p = .768$, $\eta_p^2 = 0.015$, with also univariate tests showing no significant effects of the condition on the three dependent variables (Table 5). As in Study 2a, participants in the two ToM conditions and in the control condition exhibited similar levels of interpersonal objectification. The effect of the covariates was not significant either ($Fs \leq 2.13$, $ps \geq 0.063$), except for age, $\lambda = 0.93$, $F(5,217) = 2.84$, $p = .017$, $\eta_p^2 = 0.061$, and gender, $\lambda = 0.92$, $F(5,217) = 3.58$, $p = .004$.

The same moderation analyses as in Study 2a were conducted: the findings were consistent with those of Study 2a, revealing no significant effect of the conditions on partner's choice or interpersonal objectification measures (See Table 6). However, we confirmed that individual ToM levels showed a significant negative association with both scales of relations' objectification, both when it was assessed as a general tendency and considered the partner as the target.

The results of Study 2b supported and clarified findings from previous studies. Even when using a multimedia stimulus, activation of cognitive and affective ToM did not significantly affect participants'

Table 5
Mean ratings of objectification measures depending on experimental conditions. Study 2b.

				Condition					
				Cognitive ToM activation		Affective ToM activation		Control	
Measure	*F*(10,436)	*p*	η_p^2	*M (SD)*					
Partner's choice	1.18	0.310	0.011	3.70	(2.30)	3.56	(2.53)	4.19	(2.44)
Relations' objectification (general)	0.81	0.447	0.007	2.15	(0.70)	2.23	(0.82)	2.29	(0.73)
Others' objectification	0.19	0.830	0.002	−3.54	(1.97)	−3.78	(1.97)	−3.77	(1.84)
Relation's objectification (partner)	0.21	0.813	0.002	3.38	(0.97)	3.51	(1.25)	3.56	(0.96)
Partner's objectification scale	0.05	0.956	0.000	−3.68	(1.80)	−3.76	(1.80)	−3.72	(1.89)

Note. Higher scores on *partner's choice* measure indicate preference for the more instrumental partner (Partner B), thus reflecting greater objectifying orientations.

Table 6
Regression analyses considering individual ToM levels as the moderator. Study 2b.

Dependent variable	Predictor	Estimates	SE	95% Confidence Interval		*t*	*p*
				Lower	Upper		
Partner's choice	Intercept	−0.007	0.066	−0.136	0.123	−0.104	0.917
	Cognitive ToM activation	−0.086	0.073	−0.229	0.058	−1.172	0.242
	Affective ToM activation	−0.118	0.073	−0.262	0.026	−1.613	0.108
	Individual ToM levels	−0.110	0.067	−0.242	0.023	−1.635	0.104
	Cognitive ToM activation × Individual ToM levels	0.030	0.074	−0.115	0.175	0.409	0.683
	Affective ToM activation × Individual ToM levels	0.111	0.073	−0.033	0.254	1.522	0.130
	Age	−0.021	0.067	−0.152	0.110	−0.318	0.751
	Gender	−0.111	0.066	−0.241	0.018	−1.692	0.092
Relations' objectification (General)	Intercept	0.005	0.063	−0.120	0.130	0.076	0.939
	Cognitive ToM activation	−0.089	0.071	−0.228	0.050	−1.262	0.208
	Affective ToM activation	−0.039	0.071	−0.179	0.100	−0.556	0.579
	ToM	−0.209	0.065	−0.337	−0.081	−3.215	0.002
	Cognitive ToM activation × Individual ToM levels	−0.055	0.071	−0.195	0.085	−0.778	0.437
	Affective ToM activation × Individual ToM levels	−0.059	0.070	−0.198	0.080	−0.834	0.405
	Age	−0.073	0.064	−0.200	0.054	−1.129	0.260
	Gender	−0.236	0.064	−0.361	−0.110	−3.702	<0.001
Others' objectification	Intercept	−0.001	0.066	−0.131	0.128	−0.022	0.982
	Cognitive ToM activation	0.053	0.073	−0.091	0.196	0.720	0.472
	Affective ToM activation	−0.006	0.073	−0.150	0.138	−0.080	0.936
	Individual ToM levels	−0.041	0.067	−0.173	0.092	−0.605	0.546
	Cognitive ToM activation × Individual ToM levels	0.014	0.074	−0.131	0.159	0.192	0.848
	Affective ToM activation × Individual ToM levels	0.019	0.073	−0.124	0.163	0.264	0.792
	Age	0.199	0.067	0.068	0.330	2.987	0.003
	Gender	−0.054	0.066	−0.184	0.075	−0.826	0.410
Relation's objectification (Partner)	Intercept	−0.002	0.066	−0.132	0.127	−0.037	0.970
	Cognitive ToM activation	−0.072	0.073	−0.216	0.072	−0.987	0.325
	Affective ToM activation	−0.015	0.073	−0.159	0.130	−0.200	0.841
	Individual ToM levels	−0.138	0.067	−0.270	−0.006	−2.053	0.041
	Cognitive ToM activation × Individual ToM levels	0.038	0.074	−0.107	0.184	0.522	0.602
	Affective ToM activation × Individual ToM levels	0.023	0.073	−0.120	0.167	0.321	0.749
	Age	0.017	0.067	−0.115	0.148	0.249	0.804
	Gender	−0.140	0.066	−0.270	−0.010	−2.121	0.035
Partner's objectification	Intercept	−0.007	0.065	−0.136	0.122	−0.113	0.910
	Cognitive ToM activation	0.006	0.073	−0.137	0.149	0.081	0.935
	Affective ToM activation	−0.020	0.073	−0.164	0.124	−0.275	0.783
	Individual ToM levels	−0.029	0.067	−0.161	0.103	−0.439	0.661
	Cognitive ToM activation × Individual ToM levels	0.060	0.073	−0.084	0.204	0.818	0.414
	Affective ToM activation × Individual ToM levels	0.104	0.073	−0.039	0.247	1.428	0.155
	Age	0.106	0.066	−0.024	0.237	1.605	0.110
	Gender	−0.180	0.066	−0.310	−0.051	−2.747	0.007

interpersonal objectification across different measures. However, a consistent significant effect of individual ToM levels on interpersonal objectification was observed.

Although not fully aligned with our hypotheses, Studies 1 and 2 together demonstrated that higher ToM levels corresponded to lower interpersonal objectification, a result consistent across all three studies and most of the measures considered. Studies 2a and 2b also indicated that simply activating ToM does not significantly reduce the tendency to objectify others, at least when ToM is stimulated using paradigms and materials (e.g., video watching) employed in previous work.

5. Study 3

Although ToM activation through experimental manipulation did not appear to influence interpersonal objectification, stable individual ToM levels had a clear effect. Therefore, in Study 3, we conducted a field intervention to test whether structured ToM training in school-aged children could reduce interpersonal objectification. Unlike previous Experiments, we focused on children for three key reasons: first, ToM undergoes its most significant development during childhood, a period in which this ability is more malleable and responsive to structured interventions (Wellman, 2014), making it a suitable context for testing whether a strengthened ToM can indeed impact on objectification. Second, objectifying behaviors are already present in childhood (Gasiorowska et al., 2016), suggesting that early interventions may help shape how children come to perceive and relate to others as they develop. Third, most validated ToM training programs are specifically designed for children, as it is widely assumed that enhancing ToM at this stage is not only more feasible but may also produce more enduring effects compared to adulthood, when socio-cognitive dispositions are more stable and less susceptible to training.

We used an adaption of the four-weekly validated program developed by Lecce et al. (2014), which has repeatedly shown to enhance ToM abilities regardless of cognitive ability, gender, or socio-economic status (see Bianco & Castelli, 2023 for a review). In this study, we tested whether it could also reduce objectification by improving ToM skills.

Given the established effectiveness of this training, we focused on the distinct roles of cognitive and affective ToM, using two experimental conditions rather than the original ToM and control conditions. Participants were divided into two groups: Group 1 received standard ToM training targeting cognitive ToM, while Group 2's training emphasized affective ToM using specific scenarios. To thoroughly evaluate the intervention's effectiveness, we measured both ToM and objectification of others pre- and post-intervention. Additionally, the short duration of the training (4 weeks) and the regular continuation of normal lessons, aside from the training itself, provided a controlled environment that minimized the influence of external variables, thereby strengthening the validity of the observed changes in these measures.

Compared to the beginning of the program (Time 0, T0), we first hypothesized that the group that underwent cognitive ToM training (Group 1) would report higher levels of cognitive ToM post-training

(Time 1, T1, *Hp1 a*), while the group assigned to the affective ToM training (Group 2) would report at the end higher levels of affective ToM (*Hp1 b*). We also expected that both groups would report lower levels of interpersonal objectification at the end of their respective trainings (*Hp2a*), but that these effects would be more nuanced among those assigned to the affective ToM training (*Hp2b*).

5.1. Method

5.1.1. Participants

The intervention was initially proposed to six fifth-grade classes of an Italian primary school, encompassing approximately 120 children aged between 9 and 11 years. Of these, 87 children received parental consent to participate in the study and constituted the final sample. Although logistical constraints did not allow us to conduct a priori power analyses, our sample size was nevertheless consistent with previous studies conducted using this training, which indicated a minimum sample size ranging from 50 up to 90 participants (e.g., Bianco & Castelli, 2023).

Participants were all native Italian speakers, including 47 girls and 40 boys, with a mean age of 10 years (age range = 9–11, *SD* = 0.30).

5.1.2. Procedure and materials

5.1.2.1. The training program. The training consisted of four weekly sessions, each lasting about an hour, held during regular school hours in the respective classrooms. Children were assigned to two experimental conditions: 41 to the cognitive ToM condition and 36 to the affective ToM condition. The procedure was identical for both conditions, except for the narrative stimuli employed. The cognitive ToM group was exposed to stimuli from Lecce et al. (2014), while for the affective ToM group we adapted stimuli by Feshbach and Roe (1968). Each session included two parts, featuring two stories followed by comprehension and vocabulary exercises (in the Supplementary Materials are reported the stimuli employed in both conditions). The sessions were facilitated by a trained psychologist and a counselor, in collaboration with the teachers. The sequence of activities was as follows: 1) children sat in a circle, 2) materials were distributed, 3) the story and questions were read aloud, 4) children individually wrote their responses to the comprehension questions, 5) a group discussion was held where answers were reviewed and explained. Children were encouraged to reflect on the characters' experiences and share similar experiences from their own lives. Each session concluded with a summary of the story's main theme.

5.1.2.2. ToM measures at T0 and T1. One week before the training (T0) and one week after the training (T1), children's cognitive and affective ToM levels were assessed using age-appropriate measures. Cognitive ToM was evaluated using the Italian translation (Liverta Sempio et al., 2005) of the *Strange Stories Task* (Happé, 1994), involving six mentalistic stories — three for the T0 assessment and three for the T1 assessment. After reading them, children were asked to explain the characters' behaviors with responses scored on a 3-point scale (0 = incorrect answer, 1 = partially correct answer, and 2 = full correct answer), in line with scoring guidelines (White et al., 2009), yielding total scores from 0 to 12 and higher scores indicating higher cognitive ToM. Affective ToM was measured at both T0 and T1 using the *How I feel in different situations* scale (Bonino et al., 1998), consisting of 13 items ($\omega_{T0} = 0.74$, $\omega_{T1} = 0.79$; e.g., "I understand how my friends feel by the way they behave"), rated on a five-point agreement Likert scale (1 = "*never*"; 5 = "*always*") where higher scores indicated higher affective ToM.

5.1.2.3. Interpersonal objectification at T0 and T1. Interpersonal objectification was also measured at both T0 and T1. Children's tendency to objectify relations was measured through the 10-item *Relations' Objectification Scale* (Lachowicz-Tabaczek et al., 2021) that was ad hoc adapted for the target group ($\omega_{T0} = 0.74$, $\omega_{T1} = 0.77$; e.g., "I only talk to others when I need something from them"; 1 = "*never*"; 5 = "*always*"). Additionally, we assessed children's tendencies to treat others instrumentally using four custom social dilemma scenarios, two at T0 and two at T1, to reduce familiarity effects. In each scenario, children rated their agreement with an objectifying vs. a non-objectifying action, typically involving a choice between helping someone or acting for personal gain (see Supplementary Materials for full scenarios). Ratings were provided on a five-point Likert scale (1 = "*definitely yes*"; 5 = "*definitely not*"; $\omega T0 = 0.56$, $\omega T1 = 0.75$), with higher scores indicating a greater propensity to objectify others.

At the end of the experiment, the results were shared in customized meetings with the children, their parents and the teachers (for more details see Supplementary materials).

5.2. Results

Table 7 presents the correlations between affective and cognitive ToM measurements and both objectification measures at T0 and T1. The values confirmed, as in Study 1, 2a and 2b, the existence of a negative relationship between affective and cognitive ToM and objectification. This relationship was present at both T0 and T1 for at least one of the objectification measures (see Table 7), with effect sizes ($|r| = 0.09–0.39$) falling within the small-to-large range.

A mixed-design Analysis of Variance (ANOVA) was conducted to examine the effects of ToM training (T0 vs. T1) on both cognitive and affective conditions as manipulation check, as well as interpersonal objectification measures, to verify the effectiveness of the training in reducing the tendency to objectify. A significant main effect of time was found: while the mean scores for cognitive and affective ToM increased between the first and second measurements, the mean levels of objectification decreased, confirming *Hp 1a, 1b* and *2a*. Instead, there was no significant main effect of condition, neither in the pre-training levels nor in the post-training levels, thus not confirming *Hp 2b* (see Table 8).

The results of Study 3 confirm our main hypothesis, showing that the training conducted with the children increased ToM levels and reduced interpersonal objectification levels. These findings, therefore, provide broader support for the research hypotheses, demonstrating that ToM, when stimulated through structured training, can not only increase but also serve as a preventive individual factor against interpersonal objectification. Instead, unlike our expectations (*Hp 2b*) cognitive and affective ToM intervention conditions displayed not different levels of decreased interpersonal objectification among the children involved.

6. General discussion

The tendency to objectify others is a widespread phenomenon that affects both how we perceive and interact with others during social exchanges. Despite its pervasiveness, psychological strategies to counteract interpersonal objectification remain largely unexplored. In our set of studies, we provided evidence that ToM may inhibit this tendency. Study 1 showed that individuals with higher levels of ToM were less likely to objectify others. Specifically, the higher the levels of ToM, the lower the tendency to view others as tools or to perceive relationships in purely instrumental terms. However, attempts to experimentally activate ToM (Studies 2a and 2b) did not produce significant reductions in objectification. Participants exposed to stimuli designed to activate either cognitive or affective ToM showed no notable improvement compared to a control group. This may be due to the nature of the stimuli used, which likely were not engaging enough to induce meaningful changes in attitudes or behaviors related to objectification. In fact, disrupting this dehumanizing act may require more intensive, sustained interventions, especially when it is well rooted (Gruenfeld et al., 2008; Vohs, 2015). Additionally, the passive nature of the stimuli – short film clips – might not have sufficiently engaged participants to activate ToM effectively. It is noteworthy that replication studies (e.g., Panero et al., 2016), focusing on literary fiction, have questioned earlier findings

Table 7
Correlation Matrix for Study 3 variables.

		M	*SD*	1	2	3	4	5	6	7
1	Cognitive ToM - T0	3.46	0.59	–						
2	Cognitive ToM - T1	3.60	0.58	0.73***	–					
3	Affective ToM - T0	8.50	2.06	0.27*	0.31***	–				
4	Affective ToM - T1	11.21	1.55	0.24*	0.30**	0.31**	–			
5	Relations' Objctification - T0	1.84	0.58	−0.27*	−0.39***	−0.27*	−0.16	–		
6	Relations' Objectification - T1	1.64	0.50	−0.09*	−0.37***	−0.22	−0.27*	0.64***	–	
7	Objectification scenarios - T0	2.16	0.78	−0.29**	−0.21	−0.30**	−0.24*	0.38***	0.27*	–
8	Objectification scenarios - T1	1.47	0.62	−0.012	−0.17	−0.13	−0.18	−0.18	0.50***	0.25*

Note.
* $p < .05$
** $p < .01$
*** $p < .001$.

Table 8
Results and pairwise comparisons for outcome variables depending on time and intervention conditions. Study 3.

Multivariate tests

Effect	λ	*F(4,71)*	*p*	η_p^2
Time (T0 vs. T1)	0.29	42.72	0.000	0.706
Condition (cognitive vs. affective)	0.95	0.87	0.490	0.046
Time × Condition	0.91	1.76	0.146	0.090

Pairwise comparisons per condition and time

Measure	Condition	T0	T1	Mean differences	Standard error	*p*	95% confidence interval for the difference	
		M (SD)	*M (SD)*				Lower	Upper
Cognitive ToM	Cognitive	3.55 (0.51)	3.70 (0.53)	−0.151	0.07	0.031	−0.288	−0.014
	Affective	3.31 (0.68)	3.51 (0.65)	−0.20	0.07	0.008	−0.351	−0.054
Affective ToM	Cognitive	8.85 (2.06)	11.29 (1.81)	−2.44	0.34	0.000	−3.108	−1.770
	Affective	8.08 (1.91)	11.14 (1.26)	−3.06	0.36	0.000	−3.781	−2.333
Relations' objectification	Cognitive	1.82 (0.58)	1.59 (0.46)	0.23	0.08	0.003	0.079	0.379
	Affective	1.91 (0.62)	1.66 (0.55)	0.24	0.08	0.004	0.081	0.406
Objectification scenarios	Cognitive	2.06 (0.74)	1.54 (0.72)	0.52	0.13	0.000	0.261	0.788
	Affective	2.32 (0.81)	1.36 (0.46)	0.96	0.14	0.000	0.672	1.242

Note. Based on estimated marginal means.

(Kidd & Castano, 2013), suggesting that brief exposure to priming stimuli may not be enough to significantly activate ToM. It is also possible that baseline differences in participants' ToM abilities played a larger role than anticipated, overshadowing the manipulation's effects. Studies 2a and b may suggest that a complex skill like ToM plays a significant role only when it is stable and well internalized, or when it is trained from early childhood. Study 3 addressed this issue by implementing a structured ToM training intervention with school-aged children. The results revealed a reduction in objectification tendencies following the training, offering promising initial exploration of how systematic ToM interventions might shape interpersonal perception in children.

It is worth noting, however, that the effectiveness of the training intervention is open to more than one theoretical interpretation. While we adopt a trait-based operationalization of ToM for empirical tractability, we do not commit to a strong innatist or unilinear developmental account of the construct. Usage-based and socio-interactionist perspectives suggest that ToM capacities are deeply shaped by social interaction, linguistic experience, and cultural context (e.g. Carpendale & Lewis, 2004), a view consistent with our findings, insofar as the training operated through structured narrative engagement and social interaction.

Overall, our findings contribute significantly to the ToM literature. They deepen the analysis from a social psychology perspective, supporting the view of ToM as a dimensional construct varying among individuals. This aligns with prior research suggesting that individual differences in ToM enhance social understanding and cooperation (Paal & Bereczkei, 2007), reinforcing the notion that the ability to comprehend others' mental states plays a critical role in humanizing – or dehumanizing – social interactions. Indeed, the prevalence of medium-sized associations observed between individual levels of ToM and the various indices of interpersonal objectification suggest a relationship of practical relevance, even over the short term. Importantly, individual differences in cognitive and affective ToM observed in the present studies should not be interpreted in deficit-based terms, particularly within non-clinical populations. Rather, such differences likely reflect situationally sensitive variations in motivational priorities and in the allocation of cognitive–affective resources during social interactions. Furthermore, in all the studies, we found no significant differences between cognitive and affective ToM in reducing objectification, suggesting that both dimensions of ToM may work together in fostering better social perceptions. Although we hypothesized that affective ToM might have a stronger impact in reducing objectification, the lack of differentiation between cognitive and affective ToM points to the complexity of disentangling these two dimensions. This aligns with neuroscientific evidence that cognitive and affective ToM operate synergistically (Schurz et al., 2021; Shamay-Tsoory & Aharon-Peretz, 2007).

Moreover, our results open new avenues in the literature on objectification, by suggesting possible ways to reduce it. To date, only a few studies have examined psychological strategies or processes that could mitigate this detrimental act, primarily focusing on specific domains and self-objectifying experiences. For example, in the workplace domain, Teresi and colleagues (2024) revealed that positive identification with

one's own organization is indirectly related to reduced self-objectification. By integrating these works, our studies identified ToM as a general and flexible skill that, when developed and structured effectively, could also be effective in reducing sexual or workplace objectification.

From a broader perspective, our findings carry substantial practical implications for the implementation of Social Emotional Learning (SEL) interventions in educational contexts. The success of our ToM training intervention suggests that fostering ToM in children may prevent the emergence of objectifying tendencies, promoting more humanizing and respectful relationships as they grow older. Such interventions could be applied in educational systems, potentially reducing objectification and instrumental thinking in various social domains. The positive impact of this training also offers promising directions for developing real-world applications aimed at combating the damaging effects of objectification in adulthood.

7. Limitations and future directions

Despite the importance of our findings, this research presents some limitations. First, the measures used to assess both ToM and objectification, while validated in the literature, may not have been sensitive enough to capture subtle differences in individuals' socio-cognitive abilities. Specifically, distinguishing between cognitive and affective ToM seems to be methodologically complex, as the CFA did not support the bifactorial structure of the ToM Inventory (Hutchins et al., 2021), which was subsequently treated as unifactorial. Moreover, the low convergence between self-report and performance-based ToM measures observed in Study 1 (see Table 1) further underscores the challenge of capturing this multifaceted construct through any single assessment approach. Similarly, in Study 3, affective ToM was assessed using a measure of empathy (Bonino et al., 1998), which, while age-appropriate and conceptually related, does not constitute a direct measure of affective ToM in a strict sense. Additionally, the custom scenarios for interpersonal objectification developed for Study 3 showed low reliability at T0, though it improved to a satisfactory level by T1. Future research should develop more refined instruments.

Related to this issue, while the use of multiple operationalizations of objectification was intended to maximize construct coverage, the uneven distribution of these measures across studies may limits the generalizability of findings. In particular, the operationalization of objectification through a focus on goal-characteristics of a given target, assessed through the partner selection task, was present only in Studies 2a and 2b, meaning that its association with individual ToM levels was never tested in a purely correlational design. Future research should systematically assess the ToM–objectification link across all operationalizations within the same study.

A further limitation concerns the absence of a formal manipulation check in Studies 2a and 2b to verify that the video stimuli were effective in eliciting ToM reasoning. Although both paradigms were previously validated and used in the literature, with evidence supporting their effectiveness in activating ToM processing, future studies should include explicit manipulation checks to more rigorously confirm the effectiveness of the experimental stimuli.

The absence of a control group in Study 3 represents an additional methodological shortcoming, due to logistical constraints related to the school's organization. Although we acknowledge that this is a relevant shortcoming, the decision to prioritize two experimental conditions (cognitive vs. affective ToM training) over a passive control was theoretically motivated: the training protocol we adopted (Lecce et al., 2014) had already been extensively validated in comparable school-age populations, with demonstrated effects on ToM regardless of cognitive ability, gender, or socioeconomic status, providing an established basis for its effectiveness. Moreover, the intervention lasted only four weeks and was embedded within the regular school schedule, both training conditions were administered within the same school, under identical procedural conditions and with the same teachers, which limits — though does not eliminate — the plausibility of alternative explanations such as maturation effects or differential exposure to external stimuli. Future replications would benefit from including a control group to more rigorously exclude such alternative explanations. Still, regarding Study 3, it is important to acknowledge that the effects observed pertain to a child population, which differs from the adult samples used in the previous studies. Although we consider conducting the training with a child population to be particularly valuable, any generalization of these findings, especially in comparison with the results of Study 1 and 2, would require implementing a similar training program with an adult population.

8. Conclusions

Our findings suggest the importance of ToM well beyond the cognitive domain, but as skill that plays a central role in how people perceive others within daily social exchanges. Thus, this work underscores the importance of cultivating ToM, also through structured and long-term interventions, particularly those that integrate both cognitive and affective dimensions. These interventions have the potential to reduce the human tendency to view others in an objectifying way, paving the way for healthier and more humanizing social interactions.

CRediT authorship contribution statement

Giuseppe Raguso: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Cristina Baldissarri:** Writing – review & editing, Methodology, Conceptualization. **Chiara Pecini:** Writing – review & editing, Methodology. **Mara Turi:** Investigation. **Gian Antonio di Bernardo:** Writing – review & editing, Methodology. **Luca Andrighetto:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Conceptualization.

Ethical approval

This research adheres to ethical guidelines specified in the APA Code of Conduct as well as authors' national ethics guidelines and was reviewed and approved by the Scientific Review Committees of University of Milano-Bicocca (No. IRB-2023-637; IRB-2023-696) and University of Genoa (IRB- 2024-10). All participants in the studies reported in this manuscript signed an informed consent form prior to participation and after being informed of the study's objectives. All participants received a debriefing at the end of each study.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Acknowledgements

The authors thank the “G. Marconi” State Primary School in Martina Franca, Italy—particularly principal G.A. Monaco and coordinator G. Montanaro—for their support in hosting the Study 3 project. Thanks also to Serena Lecce (University of Pavia) and Federica Bianco (University of Bergamo) for their fundamental assistance with the training protocol and its adaptation to this research.

Appendix A. Supplementary data

Supplementary materials are available online through the Open Science Framework (https://osf.io/yvcbm/overview?view_only=16d54b5bdefe4a24a91e046a37fbb8b6). Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2026.113757.

Data availability

The datasets and the materials of the studies are available through the Open Science Framework (https://osf.io/yvcbm/overview?view_only=16d54b5bdefe4a24a91e046a37fbb8b6). The design and analysis plans were preregistered for the first three studies (Study 1: https://osf.io/5y2xz/?view_only=f1fda0f58b894828a594ff6eed96b75d; Study 2a: https://osf.io/8cbuh/?view_only=51901c0a0d49419cae5c96619946ce9b; Study 2b: https://osf.io/zyh7f/?view_only=7592db2b0b8d4a64bb855709cdef7111) and not preregistered for Study 3. We report all measures, manipulations, and exclusions in the study.

References

Andrighetto, L., Baldissarri, C., & Volpato, C. (2017). (still) modern times: Objectification at work. *European Journal of Social Psychology, 47*, 25–35. https://doi.org/10.1002/ejsp.2190

Apperly, I. A., Samson, D., & Humphreys, G. W. (2009). Studies of adults can inform accounts of theory of mind development. *Developmental Psychology, 45*(1), 190–201. https://doi.org/10.1037/a0014098

Baldissarri, C., Andrighetto, L., & Volpato, C. (2022). The longstanding view of workers as objects: Antecedents and consequences of working objectification. *European Review of Social Psychology, 33*, 81–130. https://doi.org/10.1080/10463283.2021.1956778

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the mind in the eyes" test revised version: A study with normal adults, and adults with Asperger syndrome or high-functioning autism. *The Journal of Child Psychology and Psychiatry, 42*, 241–251. https://doi.org/10.1111/1469-7610.00715

Bianco, F., & Castelli, I. (2023). The promotion of mature theory of mind skills in educational settings: A mini-review. *Frontiers in Psychology, 14*. https://doi.org/10.3389/fpsyg.2023.1197328

Bonino, S., Lo Coco, A., & Tani, F. (1998). *Empatia*. Florence, Italy: Giunti.

Bowes, A., & Katz, A. (2015). Metaphor creates intimacy and temporarily enhances theory of mind. *Memory and Cognition, 43*, 953–963. https://doi.org/10.3758/s13421-015-0508-4

Carpendale, J. I. M., & Lewis, C. (2004). Constructing an understanding of mind: The development of children's social understanding within social interaction. *Behavioral and Brain Sciences, 27*(1), 79–96. https://doi.org/10.1017/S0140525X04000032

Castano, E. (2021). Art films foster theory of mind. *Humanity and Social Sciences Communications, 8*, 119. https://doi.org/10.1057/s41599-021-00793-y

Cavallini, E., Ceccato, I., Bertoglio, S., Francescani, A., Vigato, F., Ianes, A. B., & Lecce, S. (2021). Can theory of mind of healthy older adults living in a nursing home be improved? A randomized controlled trial. *Aging Clinical and Experimental Research, 33*, 3029–3037. https://doi.org/10.1007/s40520-021-01811-4

Cheng, L., Li, Z., Hao, M., Zhu, X., & Wang, F. (2022). Objectification limits authenticity: Exploring the relations between objectification, perceived authenticity, and subjective well-being. *British Journal of Social Psychology, 61*, 622–643. https://doi.org/10.1111/bjso.12500

Cheng, L., Wang, X., Jetten, J., Klebl, C., Li, Z., & Wang, F. (2024). Subjective economic inequality evokes interpersonal objectification. *The British Journal of Social Psychology*. https://doi.org/10.1111/bjso.12740

Cogoni, C., Carnaghi, A., & Silani, G. (2018). Reduced empathic responses for sexually objectified women: An fMRI investigation. *Cortex, 99*, 258–272. https://doi.org/10.1016/j.cortex.2017.11.020

Conway, J. R., Catmur, C., & Bird, G. (2019). Understanding individual differences in theory of mind via representation of minds, not mental states. *Psychonomic Bulletin & Review, 26*, 798–812. https://doi.org/10.3758/s13423-018-1559-x

Decety, J., & Jackson, P. L. (2016). A social-neuroscience perspective on empathy. *Current Directions in Psychological Science, 15*, 54–58. https://doi.org/10.1111/j.0963-7214.2006.00406.x

Di Bernardo, G. A., Pecini, C., Tallone, B., Raguso, G., & Andrighetto, L. (2025). No hard feelings: The role of self-objectification and self-dehumanization in understanding emotions and mental states in cisgender heterosexual women. *Psychology of Women Quarterly, 49*, 365–380. https://doi.org/10.1177/03616843251340962

Dodell-Feder, D., Felix, S., Yung, M. G., & Hooker, C. I. (2016). Theory-of-mind-related neural activity for one's romantic partner predicts partner well-being. *Social Cognitive and Affective Neuroscience, 11*, 593–603. https://doi.org/10.1093/scan/nsv144

Dunn, J., & Brophy, M. (2005). Communication, relationships, and individual differences in children's understanding of mind. In J. W. Astington, & J. A. Baird (Eds.), *Why language matters for theory of mind* (pp. 50–69). Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195159912.003.0003.

Ecer, E., Raguso, G., Andrighetto, L., & Gasiorowska, A. (2026). Uncovering the link between attachment and interpersonal objectification: The role of theory of mind and empathy. *Acta Psychologica, 264*, 106399. https://doi.org/10.1016/j.actpsy.2026.106399

Feshbach, N. D., & Roe, K. (1968). Empathy in six- and aeven-year-olds. *Child Development, 39*, 133–145. https://doi.org/10.2307/1127365

Fiske, S. T. (2009). From dehumanization and objectification to rehumanization. *Annals of the New York Academy of Sciences, 1167*, 31–34. https://doi.org/10.1111/j.1749-6632.2009.04544.x

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science, 2*(2), 156–168. https://doi.org/10.1177/2515245919847202

Gan, R., Qiu, Y., Liao, J., Zhang, Y., Wu, J., Peng, X., & Huang, R. (2024). Mapping the mentalizing brain: An ALE meta-analysis to differentiate the representation of social scenes and ages on theory of mind. *Neuroscience & Biobehavioral Reviews, 167*, Article 105918. https://doi.org/10.1016/j.neubiorev.2024.105918

Gasiorowska, A., Chaplin, L. N., Zaleskiewicz, T., Wygrab, S., & Vohs, K. D. (2016). Money cues increase agency and decrease prosociality among children: Early signs of market-mode behaviors. *Psychological Science, 27*(3), 331–344. https://doi.org/10.1177/0956797615620378

Gervais, S. J., Bernard, P., Klein, O., & Allen, J. (2013). Toward a unified theory of objectification and dehumanization. In *Objectification and (de)humanization: 60th Nebraska symposium on motivation* (pp. 1–23). New York: Springer. https://doi.org/10.1007/978-1-4614-6959-9_1.

Giacomantonio, M., Andrighetto, L., & De Cristofaro, V. (2025). All are objects in the eyes of those who compete: Social motivations and interpersonal objectification. *Motivation and Emotion, 49*, 348–363. https://doi.org/10.1007/s11031-025-10124-2

Gopnik, A., & Wellman, H. M. (1992). Why the child's theory of mind really is a theory. *Mind & Language, 7*, 145–171. https://doi.org/10.1111/j.1468-0017.1992.tb00202.x

Gruenfeld, D. H., Inesi, M. E., Magee, J. C., & Galinsky, A. D. (2008). Power and the objectification of social targets. *Journal of Personality and Social Psychology, 95*, 111–127. https://doi.org/10.1037/0022-3514.95.1.111

Guinote, A. (2017). How power affects people: Activating, wanting, and goal seeking. *Annual Review of Psychology, 68*, 353–381. https://doi.org/10.1146/annurev-psych-010416-044153

Happé, F. G. E. (1994). An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able autistic, mentally handicapped, and normal children and adults. *Journal of Autism and Developmental Disorders, 24*, 129–154. https://doi.org/10.1007/BF02172093

Harris, L. T., & Fiske, S. T. (2009). Social neuroscience evidence for dehumanised perception. *European Review of Social Psychology, 20*(1), 192–231. https://doi.org/10.1080/10463280902954988

Haslam, N. (2006). Dehumanization: An integrative review. *Personality and Social Psychology Review, 10*, 252–264. https://doi.org/10.1207/s15327957pspr1003_4

Hortensius, R., Kent, M., Darda, K. M., Jastrzab, L., Koldewyn, K., Ramsey, R., & Cross, E. S. (2021). Exploring the relationship between anthropomorphism and theory-of-mind in brain and behaviour. *Human Brain Mapping, 42*, 4224–4241. https://doi.org/10.1002/hbm.25542

Hutchins, T. L., Lewis, L., Prelock, P. A., & Belmonte, M. K. (2021). The development and preliminary psychometric evaluation of the theory of mind inventory: Self report—Adult (ToMI:SR-adult). *Journal of Autism and Developmental Disorders, 51*, 1839–1851. https://doi.org/10.1007/s10803-020-04654-6

Imuta, K., Henry, J. D., Slaughter, V., Selcuk, B., & Ruffman, T. (2016). Theory of mind and prosocial behavior in childhood: A meta-analytic review. *Developmental Psychology, 52*, 1192. https://doi.org/10.1037/dev0000140

Isernia, S., Rossetto, F., Blasi, V., Massaro, D., Castelli, I., Ricci, C., … Baglio, F. (2023). Measuring cognitive and affective theory of mind with the Italian Yoni task: Normative data and short versions. *Current Psychology, 42*, 23519–23530. https://doi.org/10.1007/s12144-022-03457-5

Jiang, X., Zhang, N., Sun, X., Liu, Z., & Wang, Y. L. (2024). Being pressed for time leads to treating others as things: Exploring the relationships among time scarcity, agentic and communal orientation, and objectification. *British Journal of Social Psychology, 63*, 1318–1338. https://doi.org/10.1111/bjso.12729

Kidd, D., & Castano, E. (2019). Reading literary fiction and theory of mind: Three preregistered replications and extensions of Kidd and Castano (2013). *Social Psychological and Personality Science, 10*, 522–531. https://doi.org/10.1177/1948550618775410

Kidd, D. C., & Castano, E. (2013). Reading literary fiction improves theory of mind. *Science, 342*(6156), 377–380. https://doi.org/10.1126/science.1239918

Krendl, A. C., Kennedy, D. P., Hugenberg, K., & Perry, B. L. (2022). Social cognitive abilities predict unique aspects of older adults' personal social networks. *The Journals of Gerontology: Series B, 77*, 18–28. https://doi.org/10.1093/geronb/gbab048

Lachowicz-Tabaczek, K., Andrzejewska, B. E., Juszkiewicz, A., & Babiak, J. (2025). Who tends to perceive other people as useful objects? The relationship between the general tendency to objectify other people and basic and dark personality traits. *Current Issues in Personality Psychology*. https://doi.org/10.5114/cipp/195599. Advance online publication.

Lachowicz-Tabaczek, K., Lewandowska, B., Kochan-Wójcik, M., Andrzejewska, B. E., & Juszkiewcz, A. (2021). Grandiose and vulnerable narcissism as predictors of the tendency to objectify other people. *Current Psychology, 40*, 5637–5647. https://doi.org/10.1007/s12144-019-00569-3

Landau, M. J., Sullivan, D., Keefer, L. A., Rothschild, Z. K., & Osman, M. R. (2012). Subjectivity uncertainty theory of objectification: Compensating for uncertainty about how to positively relate to others by downplaying their subjective attributes.

Journal of Experimental Social Psychology, 48, 1234–1246. https://doi.org/10.1016/j.jesp.2012.05.003

Lecce, S., Bianco, F., Devine, R., Hughes, C., & Banerjee, R. (2014). Promoting theory of mind in middle childhood: A training program. *Journal of Experimental Child Psychology, 126*, 52–67. https://doi.org/10.1016/j.jecp.2014.03.002

Liverta Sempio, O., Marchetti, A., & Castelli, I. (2005). *Traduzione italiana delle Strane Storie e delle Storie fisiche [Italian translation of the strange stories and physical stories]*. Unità di Ricerca sulla Teoria della Mente: Dipartimento di Psicologia, Università Cattolica del Sacro Cuore.

Mahy, C. E. V., Vetter, N., Kühn-Popp, N., Löcher, C., Krautschuk, S., & Kliegel, M. (2014). The influence of inhibitory processes on affective theory of mind in young and old adults. *Aging, Neuropsychology, and Cognition, 21*, 129–145. https://doi.org/10.1080/13825585.2013.789096

Majdandžić, J., Amashaufer, S., Hummer, A., Windischberger, C., & Lamm, C. (2016). The selfless mind: How prefrontal involvement in mentalizing with similar and dissimilar others shapes empathy and prosocial behavior. *Cognition, 157*, 24–38. https://doi.org/10.1016/j.cognition.2016.08.003

McGarry, K. A., West, M., & Hogan, K. F. (2021). Perspective-taking and social competence in adults. *Advances in Cognitive Psychology, 17*, 129–135. https://doi.org/10.5709/acp-0323-5

Nussbaum, M. (1995). Objectification. *Philosophy and Public Affairs, 24*, 249–291. https://doi.org/10.1111/j.1088-4963.1995.tb00032.x

Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology, 45*, 867–872. https://doi.org/10.1016/j.jesp.2009.03.009

Ozimek, P., Baer, F., & Förster, J. (2017). Materialists on Facebook: The self-regulatory role of social comparisons and the objectification of Facebook friends. *Heliyon, 3*, Article e00449. https://doi.org/10.1016/j.heliyon.2017.e00449

Paal, T., & Bereczkei, T. (2007). Adult theory of mind, cooperation, Machiavellianism: The effect of mindreading on social relations. *Personality and Individual Differences, 43*, 541–551. https://doi.org/10.1016/j.paid.2006.12.021

Panero, M. E., Weisberg, D. S., Black, J., Goldstein, T., .R., Barnes, J. L., Brownell, H., & Winner, E. (2016). Does reading a single passage of literary fiction really improve theory of mind? An attempt at replication. *Journal of Personality and Social Psychology, 111*, Article e46. https://doi.org/10.1037/pspa0000064

Pecini, C., Guizzo, F., Bonache, H., Borges-Castells, N., Morera, M. D., & Vaes, J. (2023). Sexual objectification: Advancements and avenues for future research. *Current Opinion in Behavioral Sciences, 50*, Article 101261. https://doi.org/10.1016/j.cobeha.2023.101261

Poon, K. T., Chen, Z., Teng, F., & Wong, W. Y. (2020). The effect of objectification on aggression. *Journal of Experimental Social Psychology, 87*, Article 103940. https://doi.org/10.1016/j.jesp.2019.103940

Ramezani, A., Ghamari, M., Jafari, A., & Aghdam, G. F. (2020). The effectiveness of a ToM training program in promoting empathy between married couples. *Journal of Couple & Relationship Therapy, 19*, 1–25. https://doi.org/10.1080/15332691.2019.1620145

Schimmenti, A., Jonason, P. K., Passanisi, A., La Marca, L., Di Dio, N., & Gervasi, A. M. (2019). Exploring the dark side of personality: Emotional awareness, empathy, and the dark triad traits in an Italian sample. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 38*, 100–109. https://doi.org/10.1007/s12144-017-9588-6

Schönbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize? *Journal of Research in Personality, 47*, 609–612. https://doi.org/10.1016/j.jrp.2013.05.009

Schurz, M., Radua, J., Tholen, M. G., Maliske, L., Margulies, D. S., Mars, R. B., … Kanske, P. (2021). Toward a hierarchical model of social cognition: A neuroimaging meta-analysis and integrative review of empathy and theory of mind. *Psychological Bulletin, 147*, 293–327. https://doi.org/10.1037/bul0000303

Shamay-Tsoory, S. G., & Aharon-Peretz, J. (2007). Dissociable prefrontal networks for cognitive and affective theory of mind: A lesion study. *Neuropsychologia, 45*, 3054–3067. https://doi.org/10.1016/j.neuropsychologia.2007.05.021

Spenser, K., Bull, R., Betts, L., & Winder, B. (2020). Underpinning prosociality: Age related performance in theory of mind, empathic understanding, and moral reasoning. *Cognitive Development, 56*, Article 100928. https://doi.org/10.1016/j.cogdev.2020.100928

Sprong, M., Schothorst, P., Vos, E., Hox, J., & Van Engeland, H. (2007). Theory of mind in schizophrenia: Meta-analysis. *The British Journal of Psychiatry, 191*, 5–13. https://doi.org/10.1192/bjp.bp.107.035899

Tan, L. B., Lo, B. C., & Macrae, C. N. (2014). Brief mindfulness meditation improves mental state attribution and empathizing. *PloSone, 9*, Article e110510. https://doi.org/10.1371/journal.pone.0110510

Teng, F., Chen, Z., Poon, K. T., Zhang, D., & Jiang, Y. (2016). Money and relationships: When and why thinking about money leads people to approach others. *Organizational Behavior and Human Decision Processes, 137*, 58–70. https://doi.org/10.1016/j.obhdp.2016.08.002

Tsoi, L., & McAuliffe, K. (2020). Individual differences in theory of mind predict inequity aversion in children. *Personality and Social Psychology Bulletin, 46*(4), 559–571. https://doi.org/10.1177/0146167219867957

Vaes, J., Loughnan, S., & Puvia, E. (2014). The inhuman body: When objectification becomes dehumanizing. In P. Bain, J. Vaes, & J.-P. Leyens (Eds.), *Humanness and dehumanization* (pp. 186–204). London: Psychology Press. https://doi.org/10.4324/9780203110539.

Vellante, M., Baron-Cohen, S., Melis, M., Marrone, M., Petretto, D. R., Masala, C., & Preti, A. (2013). The "Reading the Mind in the Eyes" test: Systematic review of psychometric properties and a validation study in Italy. *Cognitive Neuropsychiatry, 18*(4), 326–354. https://doi.org/10.1080/13546805.2012.721728

Vohs, K. D. (2015). Money priming can change people's thoughts, feeling, motivations and behaviors: An update on 10 years of experiments. *Journal of Experimental Psychology: General, 144*, 86–93. https://doi.org/10.1037/xge0000091

Wang, X., & Krumhuber, E. G. (2017). The love of money results in objectification. *British Journal of Social Psychology, 56*, 354–372. https://doi.org/10.1111/bjso.12158

Waytz, A., Cacioppo, J., & Epley, N. (2010). Who sees human? The stability and importance of individual differences in anthropomorphism. *Perspectives on Psychological Science, 5*, 219–232. https://doi.org/10.1177/1745691610369336

Wellman, H. M. (2014). *Making minds: How theory of mind develops*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199334919.001.0001

White, S., Hill, E., Happé, F. G. E., & Frith, U. (2009). Revisiting the strange stories: Revealing mentalizing impairments in autism. *Child Development, 80*, 1097–1117. https://doi.org/10.1111/j.1467-8624.2009.01319.x

Wilkinson, R., & Pickett, K. (2019). *The inner level: How more equal societies reduce stress, restore sanity, and improve everyone's well-being*. Penguin.

Wilkinson, R. G., & Pickett, K. E. (2009). *The spirit level: Why more equal societies almost always do better*. London: Allen Lane.

Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition, 13*, 103–128. https://doi.org/10.1016/0010-0277(83)90004-5

Yeung, E. K. L., Apperly, I. A., & Devine, R. T. (2023). Measures of individual differences in adult theory of mind: A systematic review. *Neuroscience and Biobehavioral Reviews*. , Article 105481. https://doi.org/10.1016/j.neubiorev.2023.105481

Zhang, Z., & Chen, Z. (2024). Nonhuman treatment reduces helping others: Self-dehumanization as a mechanism. *Frontiers in Psychology, 15*, Article 1352991. https://doi.org/10.3389/fpsyg.2024.1352991