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**THEORY OF MIND AND INTERPERSONAL OBJECTIFICATION:
REHUMANIZING RELATIONSHIPS IN TIMES OF SCARCITY**

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ABSTRACT

Contemporary societies are experiencing an alarming erosion of social connection and a progressive commodification of interpersonal relationships. Within this context, interpersonal objectification — the tendency to perceive and treat others as instruments or objects rather than as beings endowed with thoughts, emotions, and intrinsic worth — has become increasingly pervasive across multiple social domains. Despite its profound implications for well-being and social cohesion, surprisingly little is known about the psychological processes that protect against this dehumanizing tendency or the contextual forces that exacerbate it.

This doctoral research investigates two complementary dimensions of this phenomenon: the role of Theory of Mind (ToM)—the ability to understand others’ mental and emotional states—as a protective psychological factor against interpersonal objectification, and the role of scarcity as a contextual antecedent that promotes interpersonal objectification, while examining whether ToM can mitigate objectification even under conditions of scarcity.

These aims were addressed through nine preregistered studies ($N_{\text{total}} = 3147$) employing cross-sectional, experimental, and research-intervention designs, across diverse populations varying in age and nationality. The studies were organized into two integrated research parts. Part 1 (Studies 1, 2a, 2b, and 3; Raguso et al., 2025a) established ToM as a robust and causally relevant buffer against interpersonal objectification. In particular, Study 1 ($N = 300$) documented first consistent negative associations between multiple ToM measures and objectifying tendencies. Studies 2a and 2b ($N = 197$ and 465) showed that stable individual differences in ToM predicted lower objectification, even though brief experimental ToM activations were insufficient to elicit reductions. Study 3 ($N = 87$ children) provided causal evidence through a four-week school-based intervention: enhancing children’s ToM abilities reliably decreased their tendency to objectify others across diverse measures.

Part 2 (Studies 4, 5a, 5b, 6, and 7; Raguso et al., 2025b) broadened the focus to contextual influences, examining how scarcity—a psychological state of perceived insufficient resources—shapes interpersonal objectification and ToM. Study 4 ($N = 289$) demonstrated correlational links between perceived scarcity and heightened objectification. Studies 5a and 5b ($N = 505$ and 465) showed that brief online scarcity manipulations produced no measurable effects, suggesting that scarcity's impact emerges primarily when it is experienced as genuine and enduring. Study 6 ($N = 454$) confirmed a causal effect using a realistic scenario based on a recent blackout, with participants in high-scarcity conditions reporting markedly higher objectification. Finally, Study 7 ($N = 385$) identified the cognitive pathways through which scarcity operates: rather than exerting direct effects, scarcity was driven by perceived inequality and increased objectification via attentional tunneling on money and a heightened present-focused mindset. Notably, while perceived inequality unexpectedly enhanced ToM, scarcity undermined it, revealing a complex interplay in which the net effect on interpersonal objectification depends on the balance between these opposing processes.

Taken together, these findings advance an integrated theoretical framework in which interpersonal objectification arises from the interaction of individual cognitive capacities and contextual pressures. At the individual level, ToM safeguards against objectification by enabling recognition of others' psychological depth. At the contextual level, scarcity fosters objectification through cognitive narrowing while simultaneously eroding the very human capacities that could counteract it.

In the final section of the work, the theoretical and practical implications of these findings are discussed, highlighting how they contribute to a better understanding of the interplay between psychological processes and structural inequalities in contemporary societies.

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INTRODUCTION

In recent years, social connections have emerged as a global public health priority. The World Health Organization (WHO) Commission on Social Connection (2025) reports that loneliness and social isolation are widespread, with nearly one in six people worldwide experiencing loneliness, a condition linked to increased mortality and substantial social costs. Similarly, the U.S. Surgeon General's Advisory on the Healing Effects of Social Connection and Community (U.S. Department of Health and Human Services, 2023) identifies social disconnection as an urgent challenge, noting that lacking meaningful relationships carries health risks comparable to smoking up to 15 cigarettes a day. Moreover, recent trends reveal a decline in face-to-face social participation and an increase in time spent alone, particularly among younger adults. Surveys by the Pew Research Center (Goddard & Parker, 2025) indicate that about 16% of U.S. adults often feel lonely or isolated, with younger cohorts reporting higher rates than older ones.

Alongside these trends, concerns have grown about the ambivalent role of digital technologies. Both the WHO (2025) and the U.S. Surgeon General (2023) emphasize that technology can either foster connection or exacerbate risks, such as replacing in-person interactions or amplifying polarization. Recent studies on young adults suggest that problematic smartphone and social media use is mediated by loneliness and anxiety, highlighting a bidirectional link between technology, affective states, and social networks (Vagka et al., 2024). Particularly important, therefore, is to understand what is happening to human relationships in the current socio-cultural landscape.

Contemporary society, shaped by the consumerist mindset, tends to transform interpersonal bonds into transactional exchanges. As Bauman (2007) argues, in a world governed by consumption, relationships themselves become commodified: people are increasingly treated—and come to treat themselves—as products to be desired, used, and

discarded according to momentary utility or appeal. Somewhat supporting these assumptions in the romantic domain, studies on app dating have for example revealed that over 60% of users describe the process as “shopping for people,” emphasizing efficiency and replaceability of the possible partner, over commitment and mutual growth (Timmermans & Courtois, 2018).

Within this cultural frame, others may be perceived less as subjects with inner lives and more as instruments serving personal goals, an expression of what social psychology defines as objectification, namely the tendency to perceive and treat people as objects or means for personal goals (Nussbaum, 1995; Volpato, 2014). Objectification represents a form of dehumanization (Haslam, 2006): it entails a symbolic denial of humanity that erodes mutual recognition and moral regard. When individuals are seen as useful, replaceable and controllable objects, the ethical foundations of social life weaken. This phenomenon raises critical challenges for social and community well-being.

For social psychology, studying these dynamics has therefore become a pressing task. Understanding how and why interpersonal objectification arises is crucial not only for safeguarding psychological health and social cohesion but also for defending the deeper values that define humanity itself—dignity, reciprocity, and the capacity for authentic encounter. Research in this field can contribute to identifying psychological and cultural strategies capable of counteracting this drift and of restoring attention to the human dimension of relationships, bringing light back to the shared essence of what it means to be human.

The research project

Against this backdrop, social psychology faces a pressing question: How can we protect and restore the mutual recognition of humanity? One promising avenue involves Theory of Mind (ToM) — the ability to infer others' mental states, intentions, and preferences. Neuroscientific and psychological research suggests that activating ToM processes may counteract interpersonal objectification and promote rehumanization (e.g. Fiske, 2009; Gan et

al., 2024; Waytz et al., 2010). It is well known that failures in the recognition of others' humanity are increasingly conceptualized as a subtle form of interpersonal dehumanization (e.g. Bernard et al., 2018; Cogoni et al., 2018; Harris & Fiske, 2006). Yet despite extensive research on the antecedents and consequences of objectification (e.g. Giacomantonio et al., 2025; Guinote, 2017; Paulhus & Williams, 2002; Vohs et al., 2006; Wang & Krumbhuber, 2016), investigation of protective factors remains surprisingly limited, particularly regarding general interpersonal objectification beyond domain-specific contexts such as sexual or workplace objectification (Qiu et al., 2025; Jiao et al., 2022). The first aim of the present research project is therefore to address this gap and to determine whether ToM can indeed function as a protective factor against interpersonal objectification.

A second key focus of this project concerns the role of scarcity, a phenomenon increasingly characteristic of contemporary societies marked by growing inequality (Mani et al., 2012; Sommet et al., 2018; Wilkinson & Pickett, 2009). Scarcity refers to the subjective perception of one's resources as insufficient, a condition that carries profound cognitive and social consequences (Mullainathan & Shafir, 2013). Psychological research increasingly conceptualizes scarcity as a powerful state capable of reshaping cognitive priorities, narrowing attentional scope, and altering interpersonal perception (e.g. De Almeida et al., 2024; Mullainathan et al., 2013; Shah et al., 2012;). Within this framework, scarcity may operate as a contextual antecedent that fosters objectification, while simultaneously undermining the very processes—such as ToM—that could counteract it.

To address these issues, the research was structured in two complementary parts, each examining a distinct yet interconnected aspect of the objectification process. The first part (Studies 1, 2a, 2b, and 3) investigated whether ToM functions as a protective factor against

interpersonal objectification.¹ The second part (Studies 4, 5a, 5b, 6, and 7), developed in collaboration with the Social Psychology of Inequality Lab at the University of Granada (Spain), examined how scarcity influences objectification and ToM, thereby extending the analysis from individual-level protective factors to contextual risk factors.² Table 1 provides an overview of the research project, summarizing the main features and objectives of each study.

The thesis is organized into three main chapters. Chapter 1 offers a comprehensive overview of interpersonal objectification. It traces the historical evolution of dehumanization across cultures, examines its main theoretical foundations and clarifies the distinction between objectification and instrumentality. The chapter then reviews key manifestations of objectification in sexual, organizational, and everyday interpersonal contexts, outlining both contextual and individual antecedents. It concludes by identifying a central gap in the literature: the absence of systematic research on protective factors, thereby establishing the foundation for the empirical investigations that follow.

Chapter 2 develops the theoretical framework for understanding ToM as a protective factor against interpersonal objectification and presents the first part of empirical research. It reviews the cognitive, social, and neural dimensions of ToM, its developmental trajectory, determinants, and deficits, and evaluates evidence on interventions that enhance mental-state understanding. This framework culminates in articulating why recognizing others' minds may buffer against objectifying tendencies. The empirical section presents the first part of the research (Studies 1, 2a, 2b. and 3), which was designed to test this hypothesis using progressively stronger methodological approaches: a correlational investigation linking

¹ The studies included in this part have been integrated into a manuscript that is currently under review at *Personality and Individual Differences* (Raguso et al., 2025a).

² The studies included in this part have been integrated into a manuscript that is currently in preparation (*Raguso et al., 2025b*).

multiple ToM measures to indicators of interpersonal objectification; two experimental studies in which ToM was temporarily activated through distinct audio-visual stimuli; and a four-week school-based intervention assessing changes in children's ToM and objectification.

Table 1.

Overview of the research project

	Study	Sample (N)	Design	Main Variables	Objectives
Part 1 Theory of Mind as a protective factor against interpersonal objectification	Study 1	300	Correlational	- ToM (multiple measures) - Interpersonal objectification	Establishing correlational evidence that higher ToM is associated with lower objectification
	Study 2a	197	Experimental	- ToM manipulation (animated film with ToM-eliciting scenes) - ToM - Interpersonal objectification	Testing whether experimentally activating ToM through animated stimuli reduces objectification
	Study 2b	229	Experimental	-ToM manipulation (dramatic live-action film with ToM-eliciting scenes) -ToM - Interpersonal objectification	Replicating ToM activation using more realistic live-action material and alternative ToM/objectification measures
	Study 3	87	Intervention	- ToM school training - ToM pre-post - Interpersonal objectification pre-post	Examining whether a structured ToM training program increases ToM abilities and reduces objectification
Part 2 The impact of scarcity on interpersonal objectification and Theory of Mind	Study 4	289	Correlational	- Scarcity - ToM - Interpersonal objectification	Examining associations among scarcity, ToM, and objectification
	Study 5a	505	Experimental	- Scarcity manipulation (Stage games paradigm) - ToM - Interpersonal objectification	Testing immediate effects of induced scarcity on ToM and objectification.
	Study 5b	465	Experimental	- Scarcity manipulation (Recall task) - ToM - Interpersonal objectification - Scarcity	Replicating scarcity effects using a different induction; examine how chronic (baseline) scarcity relates to responses
	Study 6	454	Experimental	- Realistic scarcity manipulation (Black-out scenario) - ToM - Interpersonal objectification	Testing how exposure to a realistic scarcity manipulation affects ToM and increases objectification
	Study 7	385	Correlational	- Perceived inequality - Scarcity - Attentional tunneling on money - Present-focused mindset - ToM - Interpersonal objectification	Identifying cognitive mechanisms (tunneling, present-focus) linking inequality and scarcity to objectification; test mediation vs moderation patterns

Chapter 3 examines scarcity as a contextual antecedent of interpersonal objectification and explores its interaction with ToM. It situates scarcity within broader structures of inequality and poverty, reviews its cognitive and motivational consequences, and analyzes its ambivalent effects on social behavior. Building on this literature, the chapter proposes scarcity as a potential trigger of objectification and questions whether ToM retains its protective function under conditions of resource limitation. The empirical section includes the second part of the research (Studies 4, 5a, 5b, 6, and 7) which combines correlational and experimental methods: an initial test of the relationships among scarcity, ToM, and objectification; two experimental inductions of scarcity using game-based and recall procedures; a realistic scenario-based manipulation; and a final correlational study employing multiple mediation models to examine cognitive mechanisms—such as attentional tunneling and present-focused temporal orientation—linking inequality, scarcity, ToM, and objectification.

Finally, the General Discussion integrates findings across both research parts, outlining theoretical implications for understanding how individual capacities and socio-structural conditions jointly shape interpersonal objectification, discussing applied implications, addressing methodological strengths and limitations, and identifying directions for future research.

Ethical issues, open science and good practices

Any procedural aspect of the present research project completely conformed to the ethical guidelines of the Italian and American Psychological Associations, the Declaration of Helsinki and the Oviedo Bioethics Convention. Explicit consent from the local Ethics Committee has been sought before beginning any experiment involved by the project. Data are protected according to the D.Lgs 196/2003 and UE GDPR 679/2016 and are thus ensured that participants cannot be directly linked with any of their data. Explicit and written informed

consent has always been sought. Any condition that could induce some discomfort in the participants has been disclosed to them before the beginning of the session.

To ensure transparency and reproducibility, all hypotheses, methods, and experimental materials of the studies conducted were pre-registered on the Open Science Framework, where the collected data and subsequent analyses are also publicly available. Researchers will be able to access freely all the data via the OSF repository (Studies 1, 2a, 2b, and 3: <https://osf.io/yvcbm/overview>; Studies 4, 5a, 5b, 6, and 7: <https://osf.io/ehbd6/overview>). Data and materials will remain freely available in the OSF repository for at least 15 years. During this period, researchers will be free to download raw materials and the datasets associated with the studies included.

CHAPTER 1

INTERPERSONAL OBJECTIFICATION

1.1 – The denial of humanity: Brief history and forms of dehumanization

At first glance, reflecting on the denial of humanity may seem paradoxical in the aftermath of the twentieth century's great wars, major peace treaties, international human rights agreements, and remarkable technological progress. Yet history and, regrettably, even the present abound with cases in which the humanity of individuals or entire groups has been denied, either explicitly or in subtle ways. Such denial strips its targets of autonomy, dignity, and the capacity to define their own subjectivity, creating a dangerous asymmetry between those regarded as fully human and those perceived as lacking essential human qualities. This process, known in social psychology as *dehumanization*, has manifested in numerous forms throughout history. It is multifaceted, flexible, and adaptive, reshaping itself across contexts, relationships, and historical periods according to prevailing cultural norms and ideologies (Haslam, 2006; Volpato, 2014).

In classical antiquity, the notion of the human was conceived as an intermediate realm between divinity and animality, a hierarchy that placed the free, adult male at its apex. Beneath him stood women, and at the lowest level were slaves, who were often equated with beasts or inanimate objects. Warfare frequently resulted not only in territorial conquests but also in the capture of prisoners reduced to slavery, a source of unpaid and rightless labour that could be exploited, abused, or destroyed when no longer useful (Volpato, 2014). This form of dehumanization, later referred to as *animalization*, persisted throughout the Middle Ages and extended into the modern era. A prominent example is the extermination of Indigenous populations following the so-called discovery of the Americas. The ideology underpinning this process rested on the association of native peoples with animals, who were thus treated by

European colonizers as wild creatures to be exploited or exterminated. Between 1492 and the nineteenth century, this resulted in a genocide that claimed between 50 and 100 million lives (Stannard, 1992). Western culture continued to employ animalization across colonial contexts. African peoples were compared to apes, denied membership in the human species, and consequently subjected to systematic exploitation and enslavement (Jahoda, 1999).

In North America, animalistic dehumanization was often accompanied—and in some respects surpassed—by another form: *demonization*. This entailed depicting or condemning Indigenous peoples as demonic beings, embodiments, or emanations of evil, attributing to them perverse, malevolent, or diabolical qualities and intentions. Native Americans were commonly referred to as “red devils” and frequently portrayed in narratives and chronicles as satanic entities that had to be eradicated (Svaldi, 1989).

Dehumanization, however, has not been confined to the colonial or ethnic domain. For centuries, demonization served as a primary strategy to justify the persecution of women accused of witchcraft. Within Christian Europe, women were often regarded as inherently weak, morally inferior, and therefore more susceptible to the devil’s influence (Volpato, 2014). This belief was reinforced by both theological texts and the prevailing social structures of the time: approximately 80% of those accused of witchcraft were women, and their persecution reflected a broader process of controlling and repressing female roles (Purkiss, 1996). The figure of the witch thus embodied a liminal threat to moral and religious order—an entity to be eradicated. Demonization in this context not only denied the victim’s humanity but also transformed her into the embodiment of absolute evil (Levack, 2013).

Similarly, demonization played a crucial role in the wars of religion, where the enemy was not merely dehumanized but portrayed as an adversary of God and an agent of evil. As Normand (2016) notes, demonization has its roots in religion, yet its persistence throughout history is primarily political. Attributing diabolical traits to one’s opponents legitimizes

violence, mobilizes collective hatred, and forecloses the possibility of dialogue. During Europe's confessional conflicts, enemies were depicted as heretics or infidels possessed by the devil, which rendered their extermination or exclusion morally justified (Normand, 2016). In both witch hunts and religious wars, demonization functioned as an ideological mechanism that transformed the Other into an ontological threat—making violence appear not only acceptable but necessary to restore a presumed divine and social order.

In the modern era, the dehumanization of the poor and socially marginalized became a structural component of emerging social hierarchies. With the rise of bourgeois rationality and capitalist order, the lower classes were increasingly portrayed as lacking the moral and rational qualities that defined the full humanity of the dominant classes. Aristocrats and the urban bourgeoisie described the poor as coarse, bestial, and incapable of self-control or civic virtue—“the vilest part of humanity” (Volpato, 2014). This representation not only justified inequality but also rendered economic and political exclusion morally acceptable. During revolts, political repression was framed through medical and moralizing language, describing violence as a necessary act of social purification. In this sense, political power operated as a mechanism of collective hygiene, designed to eliminate elements considered impure or dangerous (Foucault, 1975; Pick, 1989). Poverty and deviance were thus medicalized and criminalized, marking a shift from the logic of charity to one of social control and bodily discipline.

References to pathology point to a particularly insidious form of dehumanization: *biologization*. This form is grounded in the deep human fear of disease and employs metaphors of pathology, hygiene, and purity, transforming others into microbes, viruses, pests, tumours, or filth. The germ theory of disease effectively replaced the devil as a metaphor of danger, and medical-hygienic imagery became a powerful political and symbolic tool. Society was reimagined as a collective body to be defended against contamination through drastic measures—often targeting specific individuals or groups (Volpato & Andrighetto, 2015).

Biologizing metaphors appeared in many of the twentieth century's genocides. In Nazi propaganda, for example, Jews were described as parasites or bacilli to be eradicated—a language that transformed killing into disinfection and annihilation into healing (Musolff, 2010). Sadly, this mechanism is not confined to the past. Biologizing discourse persists today in narratives that stigmatize migrants as “invasions” or “infectious waves,” the poor as “social waste,” and manual labourers as “impure” or “contaminated” (Valtorta et al., 2019; Haslam, 2006).

The technological advances of the nineteenth and twentieth centuries gave rise to a new expression of the older, previously discussed form of animalization, one more directly aimed at legitimizing the exploitation of others: *mechanistic dehumanization*. In the emerging industrial world, Taylorism theorized the total subordination of human beings to the productive system, and workers came to be regarded as mere mechanisms or cogs within the vast machinery of industry. The alienation of labour, described by Marx (1844) and cinematically portrayed by Chaplin in *Modern Times*, assumed extreme forms in which each worker was expected to be unskilled, entirely replaceable, and devoid of intellectual autonomy (Volpato, 2014).

As this brief historical overview illustrates, dehumanization has taken multiple forms throughout time. It adapts to places, people, and relationships, assuming meanings and imagery consistent with the dominant cultural climate. From early metaphors evoking animals and demons to later biological and mechanistic representations, dehumanization continually reshapes itself to fit new social and ideological contexts. At times, different dehumanizing frames have coexisted or overlapped, targeting the same individuals or groups with composite narratives of inferiority. What all these forms share, however, is their role as instruments of social oppression and as mechanisms for legitimizing inequality, a function that unfortunately persists in contemporary societies (Boysen et al., 2020; Kteily et al., 2015; Markowitz & Slovic, 2020; Sainz et al., 2020).

1.2 – When people became things: Theorizing objectification

If dehumanization transforms and adapts to historical and cultural contexts, in contemporary society it has assumed a particularly subtle yet no less pernicious expression, long recognized and critiqued by social psychologists. In a world where capital occupies the apex of the value hierarchy and consumption has become the organizing principle of life, individuals are compelled to transform themselves into commodities, instruments, and objects. As Bauman (2007) observes in *Consuming Life*, in consumer society no one can become a subject without first turning into a commodity: social recognition depends on the ability to present oneself as a desirable product, evaluated, compared, and exchanged within a market of appearances. Subjectivity itself is thus constructed within market logics, reducing the person to a functional and measurable entity. It is therefore unsurprising that contemporary dehumanization manifests in the form of what has been termed *objectification*, the tendency to perceive and treat others as things, tools, or goods (Volpato, 2014). This dynamic, however, is far from new. Marx (1844) had already exposed how the capitalist system generates alienation, stripping workers of their human essence and reducing them to cogs in the productive machinery. Building on Marx's analysis, Lukács (1972) developed the concept of reification to capture how, under capitalism, social relations are transformed into relations between things. The philosopher emphasized that the commodity form became “the universal category of society as a whole,” and that the logic of exchange thus started to permeate both objective structures and subjective experience. Human capacities, emotions, and relations are thereby transformed into quantifiable properties—things to be possessed, measured, or traded—and individuals begin to relate to one another as objects of use and value (Stahl, 2023). From this perspective, objectification emerges as a historically specific stage in a broader process of social transformation, one that, beginning with the industrial exploitation of labor, has progressively

extended into social relations and even into the very construction, or erosion, of personal identity.

Martha Nussbaum (1995) was the first to offer a systematic psychological theorization of objectification, identifying seven core dimensions: (1) instrumentality—treating a person as a tool for another’s purposes; (2) denial of autonomy—depriving a person of self-determination; (3) inertness—viewing the person as lacking agency or activity; (4) fungibility—regarding the person as interchangeable with others; (5) violability—disregarding the person’s physical or psychological integrity; (6) ownership—treating the person as something that can be possessed, bought, or sold; and (7) denial of subjectivity—ignoring the person’s feelings and experiences. Not all dimensions are necessarily present at once: for example, in slavery, an individual may be commodified, instrumentalized, sold, and violated, yet not necessarily perceived as inert. According to Nussbaum, the defining feature of objectification lies in the presence of at least one of these dimensions—most notably, instrumentality—through which an individual is viewed as an object to be used for someone else’s ends.

Indeed, instrumentality is what most clearly distinguishes objectification from other forms of dehumanization. While animalistic and mechanistic dehumanization typically produce psychological distance, avoidance, or moral disengagement from the target, objectification reverses this dynamic: it prompts approach and exploitation. When others are perceived as objects or tools, they become not only less human but also useful, something to be acted upon, manipulated, or consumed. This conceptual distinction finds compelling empirical support in the work of Martínez and colleagues (2015). Across three experiments, the authors showed that people are willing to interact with dehumanized others only when these are simultaneously objectified, that is, when they can serve instrumental purposes. Specifically, participants preferred contact with animalistically dehumanized groups in social contexts, and with mechanistically dehumanized groups in professional contexts, but only insofar as those groups

were seen as functionally useful. In the absence of instrumentality, both forms of dehumanization led to social withdrawal and avoidance.

Instrumentality, however, is not inherently problematic. On the contrary, it is often indispensable to human relationships. Consider, for instance, the bond between a mother and her newborn: the infant depends entirely on the mother for nourishment, protection, and access to the world. Likewise, relationships with relatives and friends frequently involve instrumental exchanges of help and support, and alliances of all kinds are typically formed with instrumental purposes in mind. Employment relationships also entail a degree of instrumentality, as workers pursue goals that primarily serve others. Empirical research has further clarified the functional and dynamic role of instrumentality in close relationships. Fitzsimons and Shah (2008) demonstrated that people's evaluations of others fluctuate according to their current goals: individuals are more likely to feel positively toward and approach those who are instrumental to their active goals, and to distance themselves from non-instrumental others. This goal-dependent evaluation mechanism reflects the self-regulatory function of relationships—partners become valued to the extent that they facilitate goal progress. Later, Fitzsimons and Fishbach (2010) showed that such instrumental closeness is not static but varies with perceived goal progress: when a goal remains unfulfilled and retains high motivational priority, individuals draw closer to instrumental others; once the goal is achieved or advances substantially, this preference diminishes, allowing attention to shift toward others instrumental for new goals. Therefore, instrumentality operates as a fluid principle of relational regulation, one that supports adaptation and goal balancing rather than necessarily implying dehumanization.

If instrumentality sustains and even enriches relationships, the crucial question becomes: when does it cross the threshold into objectification? Nussbaum (1995) argues that “what is problematic is not instrumentalization *per se* but treating someone primarily or merely as an

instrument.” Objectification thus occurs when a person is reduced to a mere means for achieving another’s goals and their personhood is disregarded. While instrumentality can be a natural and even beneficial aspect of human connection, fostering closeness and satisfaction when both partners perceive each other as instrumental to important goals (Orehek & Weaverling, 2017; Orehek et al., 2018), it becomes problematic when reciprocity and the acknowledgment of personhood are absent. As Papadaki (2012) emphasizes, objectification becomes morally objectionable when it entails the denial of another’s humanity. In this sense, the degree of mutuality and reciprocity is central in determining whether instrumentality constitutes objectification: when one party uses another solely for self-serving purposes, ignoring autonomy, agency, and subjective experience, the relationship becomes unequal and objectifying (LaCroix & Pratto, 2015).

Haslam and colleagues (Haslam, 2006; Haslam et al., 2012) sought to clarify what it means to deny another’s humanity and how this process operates, beginning with a definition of the very concept of *humanness*. In their research, they identified two fundamental dimensions of humanity: (1) human uniqueness, encompassing learned traits such as civility, refinement, moral sensibility, rationality, and maturity; and (2) human nature, comprising innate and universal traits such as emotionality, interpersonal warmth, cognitive openness, agency, individuality, and depth. Their studies demonstrated that the denial of human uniqueness contributes to animalistic dehumanization, whereas the denial of human nature, reflected in the negation of individuality, emotionality, and agency leads to mechanistic dehumanization and facilitates the erasure of subjectivity. Building on this framework, Loughnan and colleagues (2010) provided empirical evidence that objectification entails a denial of humanity itself. Their findings showed that when individuals are objectified, they are perceived as possessing fewer mental and moral capacities, a process Loughnan and colleagues termed *depersonalization*.

The loss or reduction of human characteristics in the eyes of the objectifier has found further empirical support in recent research examining objectification at the cognitive–perceptual level. In particular, Bernard and colleagues (2018) demonstrated that objectification extends beyond social and moral domains, influencing the very way people visually and cognitively process others. Their experiments revealed that when individuals are objectified, observers tend to perceive and recognize them not as integrated human beings, but in a part-based manner, akin to how physical objects are processed. This object-like processing implies a shift from configural to analytical perception, in which the person’s body is mentally fragmented into separate components (e.g., legs, chest, torso) rather than perceived as a unified whole. Such findings provide compelling evidence that objectification operates as both a psychological and perceptual mechanism through which the human subject is literally seen as less than human (Bernard et al., 2018). Moreover, this cognitive reduction closely aligns with Langton’s (2009) expansion of Nussbaum’s (1995) model. Indeed the philosopher introduced three additional forms through which individuals can be treated as objects: reduction to a body or body parts (when the person is identified primarily with their physical features), focus on appearance (when the person is evaluated mainly based on how they look), and silencing (when the person is perceived as lacking voice or agency). This convergence of philosophical models and experimental evidence underscores the profound dehumanizing power of objectification, framing it as a mechanism that transforms persons into things at every level of human interaction.

1.3 – Sexual objectification and self-objectification

Historically, the psychological study of objectification centered on *sexual objectification*, the process by which individuals, most often women, are perceived and treated primarily as bodies or instruments of sexual gratification. The concept of sexual objectification can be traced

back to Kant (1932) and was further developed by feminist thought, which focused on the process by which women are reduced to sexual objects in contemporary society (Papadaki, 2007). According to this view, objectification involves evaluating women solely in terms of their sexual parts or functions, isolated from the person and treated as representative of her entirety. In Bartky's (1990) analysis, within patriarchal societies women are approached or ignored based on their utility as sex objects, independent of any other qualities. In this sense, the literature also refers to *sexualization*, denoting situations in which a person's value is restricted exclusively to their capacity for sexual attractiveness (Volpato, 2014).

Dworkin (1981) and MacKinnon (1987, 1989) conceptualized sexual objectification as a structural mechanism underpinning women's oppression. MacKinnon argues that sexuality in patriarchal societies is organized by power, with objectification serving as a vehicle of male dominance: men desire and act; women are desired and acted upon. Dworkin identifies pornography as the clearest manifestation of this process, presenting women as bodies to be used and consumed. Sexual objectification thus strips women of subjectivity and reduces them to instruments of pleasure.

Subsequent empirical research broadened the analysis to encompass cultural, cognitive, and motivational processes, identifying perceptual, motivational, and sociocultural factors that interact in complex ways (for a review, see Pecini et al., 2023). Literature is unanimous in recognizing the central role of mass media in sustaining a culture of sexual objectification. Media portrayals reproduce female images defined by stereotypical traits: women's bodies are obsessively sexualized, commodified, and used to sell products. The proliferation of sexualized images is so pervasive that escaping their impact has become virtually impossible. As a result, these representations contribute to the diffusion of cultural norms that naturalize the instrumental use of women's bodies, legitimizing their treatment as means rather than ends in themselves. In this way, objectification becomes embedded in everyday social perception,

shaping collective beliefs about gender, desirability, and value (Volpato, 2014). Moreover, the woman depicted in the media is typically young, thin, smooth, and radiant, while any deviation from this ideal is marked as an intolerable flaw. The result is a temporal compression that erases the natural flow of life stages: girlhood is sexualized, while adulthood is unnaturally frozen in youth. These aesthetic standards become social norms that nearly every woman feels compelled to conform to, leading to inevitable inner conflict as the idealized image is inherently unattainable (Valtorta et al., 2016).

Constant visual exposure to sexualized bodies shapes how individuals cognitively perceive others. Empirical studies indicate that sexualized bodies elicit analytic rather than configural processing, leading observers to perceive individuals in terms of discrete body parts. Neurocognitive evidence indicates reduced activation in regions involved in social cognition when viewing sexualized female images, supporting a shift toward object-like encoding (Bernard et al., 2018).

Beyond perceptual mechanisms, social-motivational factors also contribute to sexual objectification. Bareket and Shnabel (2019), drawing on social dominance theory, showed that individuals high in social dominance orientation objectify women as a strategy for maintaining hierarchies. Women who feel sexually objectified show more submissive behaviors and poorer cognitive performance, indicating that objectification impairs functioning and reinforces inequality.

At the interpersonal level, Vaes and colleagues (2011) investigated the psychological motives driving sexual objectification. Their findings revealed that when women objectify other women, they often dissociate themselves from such representations, judging them as vulgar or superficial. The stronger this negative evaluation, the greater the tendency to perceive objectified women as an outgroup from which to distance themselves, thus triggering a process of dehumanization. In contrast, when men objectify women, the process appears less related to

the target's specific features than to the type of relationship desired. In particular, sexual attraction focuses attention on physical attributes, reducing the perception of the other's humanity (Vaes et al., 2011). Moreover, Pecini et al. (2024) found that men's sexual objectification of their romantic partners can contribute to women's justification of dating violence. Thus, although the outcome is similar across genders, mechanisms differ: in men, objectification stems from sexual arousal; in women, from social distancing.

More recently, research has begun to conceptualize sexual objectification not merely as a perceptual or individual process but as a dynamic phenomenon unfolding within social interactions. Within this perspective, the *Social Interaction Model of Objectification* (SIMO; Gervais et al., 2020) describes objectification as a goal-based exchange process between men and women, rooted in patriarchal structures and cultural norms. According to this model, both ideological antecedents (e.g., sexism, gender system justification) and situational contexts (e.g., social or occupational environments with permissive norms) shape the activation of objectifying sexual goals in men and self-objectifying goals in women. These pre-interactional processes guide behaviors during social encounters—such as gaze patterns, verbal comments, and physical contact—which in turn determine whether the interaction continues or is disrupted. Crucially, the SIMO posits that objectification is not unidirectional but bidirectional and interactive, emerging through reciprocal behaviors and perceptions that reinforce gender roles.

Sexual objectification produces far-reaching psychological consequences. Fredrickson and Roberts's (1997) objectification theory posits that continual exposure to objectifying practices and gazes leads to the internalization of an external perspective—a process known as *self-objectification*. Through this process, the objectifying gaze of others becomes internalized by their targets, who learn to perceive and evaluate themselves primarily in terms of their physical appearance and sexual desirability. This internalization fosters habitual body monitoring (body surveillance), accompanied by body shame and appearance anxiety, which in

turn impair concentration, cognitive performance, and emotional well-being (Fredrickson & Roberts, 1997; Tiggemann & Williams, 2012). Self-objectification is associated with numerous negative outcomes, including low self-esteem (Moradi & Huang, 2008), depressive symptoms (Szymanski & Henning, 2007), eating disorders (Calogero et al., 2011), reduced agency and personal efficacy (Calogero, 2013), and reduced ability to understand others' emotions and mental states (Di Bernardo et al., 2025).

Although women primarily bear the costs of sexual objectification, men can also be affected, albeit to a lesser extent (Guo et al., 2025). Cultural and media transformations since the 1990s, particularly the growing visibility of idealized male bodies in advertising, cinema, and mass media, have contributed to the diffusion of rigid aesthetic standards centered on strength, muscularity, and virility. This phenomenon, known as the *muscular ideal* (Leit et al., 2002; Pope et al., 2000), promotes a hyperfocused representation of the male body as a symbol of power and desirability, prompting men to evaluate themselves according to aesthetic and sexual parameters similar to those imposed on women. Research by Tiggemann and Kuring (2004) demonstrated that, among men as well, the internalization of the objectifying gaze leads to self-objectification and body surveillance, which are associated with body dissatisfaction, physical shame, and controlling body-related behaviors. However, the underlying dynamics partially differ from those observed in women. Whereas women typically experience pressure toward thinness, men face a dual constraint between leanness and hypermuscularity (Daniel & Bridges, 2010; Edwards et al., 2014).

In sum, sexual objectification emerges as both a personal experience and a social process: it regulates interactions, reinforces hierarchies, and shapes how individuals perceive and relate to one another. Far from being confined to sexuality, however, objectification represents a broader paradigm for interpersonal dehumanization.

1.4 – Objectification in the work domain

“Work ennobles man”—a maxim echoed across cultures and centuries—captures the enduring belief that labor is a source of dignity and moral elevation. Yet, in contemporary organizational contexts, this ideal often collides with practices that reduce individuals to mere instruments of productivity. Empirical evidence from large-scale workplaces illustrates how modern labor systems can systematically erode workers’ sense of agency and humanity. In this regard, recent investigations into Amazon’s warehouse operations reveal how algorithmic management, constant surveillance, and machine-paced performance metrics produce what critics have termed *digital Taylorism*, transforming workers into extensions of technology rather than autonomous agents (Palmer, 2023; Rozmysłowicz and Krzyżaniak, 2023). These examples vividly illustrate what Marx (1844) had already foreseen: in a capitalist society, work ceases to be a free and self-realizing activity and instead becomes an external imposition in which workers are reduced to mere tools, valued only for their productive output (Marx, 1844).

Social-psychological research conceptualizes this condition as *workplace objectification*—the experience of employees who feel treated by their organization as instruments rather than as subjects, denied individuality, autonomy, and personal worth (Baldissarri & Fourie, 2023). According to Zhang and colleagues (2025), this phenomenon represents a multifactorial condition emerging when organizational structures and practices overemphasize productivity and control at the expense of recognition and subjectivity, reflecting the combined outcome of structural, relational, and psychological determinants.

Foundational experiments by Andrighetto et al. (2017) showed that specific task features such as repetitiveness, fragmentation, and other-direction (machine-paced or externally controlled work) are sufficient to elicit objectifying perceptions of workers. Participants exposed to videos of factory labor, as opposed to artisanal work, attributed fewer mental states and more instrument-related qualities to the worker, particularly when attention was directed

toward the mechanical features of the task rather than the person performing it. This “task-feature account” demonstrates how work structure shapes mental representations. Baldissarri, and colleagues (2017) extended this evidence, showing that perceiving one’s work as repetitive, fragmented, and other-directed increases feelings of alienation, which in turn predicts implicit and explicit denial of mind to workers (Gray et al., 2007).

Crucially, as sexual objectification, workplace objectification also affects the self. When individuals are treated instrumentally, or perform objectifying tasks, they may internalize these perceptions, a process known as *working self-objectification* (Baldissarri et al., 2014). Across studies, repetitive and externally paced tasks increase self-objectification and reduce belief in free will (Baldissarri et al., 2017). Consistently, a field study of 303 manufacturing workers confirmed that objectifying task features and instrumental supervisory treatment predict self-objectification, which mediates reduced free-will beliefs (Baldissarri et al., 2019). This relationship is bidirectional: diminished belief in free will further increases self-objectification. Experimental work shows that instrumental treatment decreases perceived agency, engagement, and performance quality (Baldissarri & Andrighetto, 2021). Finally, following the same line, Andrighetto et al. (2018) demonstrated that self-objectification fosters conformity: after performing highly objectifying activities, participants were more likely to align with others’ opinions. Experiencing oneself as an object thus reduces independent judgment and contributes to the reproduction of dehumanizing organizational practices.

Beyond task characteristics, workplace objectification is also sustained by relational and institutional factors that define the broader organizational climate. In their recent review, Zhang et al. (2025) identified structural (rules, metrics), relational (leadership), and cultural (organizational values) antecedents. On the relational level, abusive supervision strongly predicts organizational dehumanization, while coworker support partially buffers its effects (Caesens et al., 2019). At the structural level, Lagios et al. (2022) documented that

dysfunctional bureaucratic procedures likewise elicit dehumanization, undermining autonomy and satisfaction. Perceived inequality and injustice also promote objectification: unequal workplaces reduce job satisfaction and dignity through dehumanization and self-objectification (Sainz et al., 2023). Finally, organizational culture further matters: calculative corporate environments increase interpersonal objectification and reduce belonging, even when conveyed through mission statements (Belmi & Schroeder, 2021).

A growing body of research examines artificial intelligence as a new source of workplace objectification. Cao et al. (2025) found that when leaders anthropomorphize robots, employees feel objectified, interpreting such behavior as implying interchangeability between humans and machines. Chen et al. (2025) found that institutionalized AI use generates threat by making employees feel replaceable. Gabbiadini et al. (2025) showed that evaluation by an AI recruiter (vs. human) reduces self-efficacy and increases self-objectification, which lowers belief in free will.

Overall, workplace objectification emerges wherever work structures, relationships, or technologies obscure workers' subjectivity. Through repetitive tasks, algorithmic management, abusive supervision, bureaucratic constraints, or human-machine dynamics, workers' minds risk being eclipsed by instrumental logic—realizing, in psychological form, the alienation described by Marx.

1.5 – Interpersonal objectification

Far from being a phenomenon confined to a few specific domains, objectification, as discussed in the previous sections, appears to represent a broader drift within contemporary thought and society. It is not restricted to isolated contexts but permeates virtually all dimensions of individual and social life. In consumerist societies, individuals may feel treated—and treat others—as objects of consumption: sought, used, and discarded according to

their temporary utility or appeal. As Bauman (2007) argues, such dynamics erode the depth and stability of emotional bonds, reducing others to means for personal gratification or advantage rather than valuing them as ends in themselves.

Recent social-psychological research confirms this tendency across diverse interactions. Within this framework, scholars have introduced the concept of *interpersonal objectification*, referring to the form of objectification that may arise in everyday social relationships, independently of sexual motives or professional contexts (Giacomantonio et al., 2025). From this perspective, objectification also reflects a relatively stable individual orientation: a tendency to perceive others as tools while disregarding their humanity.

To better understand this phenomenon, research has sought to identify its antecedents, that is, the factors that facilitate its emergence and development. Broadly speaking, these antecedents can be grouped into two main categories. The first includes contextual factors, such as situational cues that increase the likelihood of objectifying behavior. The second comprises individual factors, such as personality traits and motivational dispositions that predispose individuals to perceive others instrumentally. Each of these factors can be regarded as a discrete element within a larger framework, which only when considered in its entirety can illuminate such a complex and pervasive psychological and social phenomenon.

Contextual factors

Salience of money

Several studies have shown that money serves as a crucial contextual factor in triggering objectifying behaviors. Merely thinking about it, or having the concrete or abstract possibility of obtaining it, appears to increase psychological distance from others and reduce the willingness to help. In a series of nine experiments, Vohs et al. (2006) demonstrated that simple reminders of money lead people to prefer solitary activities and to work independently rather than in groups, to maintain greater physical distance from strangers, and to offer less assistance,

both in terms of time (e.g., helping a colleague understand instructions or picking up dropped pencils) and in terms of money (significantly smaller donations). Subsequent studies replicated these effects using subtle primes such as images of banknotes or money-related screensavers, consistently showing reduced helpfulness, greater interpersonal distance, and stronger preferences for working alone (Molinsky et al., 2012; Vohs et al., 2008). These patterns were further supported by a review of over 160 experiments across 18 countries: money primes decrease prosociality, empathy, and willingness to help, while increasing performance orientation and interpersonal distance (Vohs, 2015). Collectively, these effects may foster a more instrumental view of others and of social relationships (see also Ma-Kellams & Blascovich, 2013). Indeed, money seems to orient human relations toward an exchange logic. Teng et al. (2016b) showed that reminders of money activate a market-pricing mindset, prompting people to evaluate others in terms of utility and instrumentality. As a result, in goal-directed contexts, money increases the tendency to approach individuals perceived as highly useful and, conversely, to avoid those regarded as less so. This effect is mediated by perceived instrumentality and weakens when personal competence is high or when the other's utility is ambiguous. These findings suggest that money does not simply foster social withdrawal, but rather encourages relational selectivity grounded in cost–benefit reasoning, reinforcing an instrumental conception of social interactions. Further evidence indicates that adopting an exchange orientation—evaluating relationships in terms of cost–benefit ratios and expecting immediate reciprocity—magnifies instrumental attitudes toward partners, both in partner selection and established relationships, partially due to heightened motivation to maximize personal gain. Bride price practices in a quasi-natural experiment similarly predicted greater instrumentality and lower relationship satisfaction (Wang et al., 2022). Moreover, a calculative mindset promotes self-interested behavior even at the expense of ethics (Wang et al., 2014).

Overall, money and market logic reinforce instrumental perceptions, social distance, and transactional orientations in interpersonal relations.

Power

Power is among the most pervasive social conditions shaping how individuals perceive and treat others. Far from being a functional advantage alone, it fundamentally alters social cognition. Empirical evidence shows that power increases autonomy but reduces perspective-taking, fostering perceptual and relational detachment and a more objectifying view of others (for a review, see Guinote, 2017). In this regard, several studies have shown that power impairs the ability to adopt another person's perspective. Across different experimental manipulations, individuals placed in positions of power were found to be more anchored to their own point of view, less accurate in recognizing others' emotions and mental states, and generally less attuned to their interlocutors. These effects arise because power activates an approach-oriented mindset that prioritizes goal pursuit over social sensitivity, generating a form of cognitive egocentrism that diminishes empathy and social attunement (Galinsky et al., 2006; Nissan et al., 2015). It is therefore unsurprising that, in their series of studies, Gruenfeld et al. (2008) demonstrated that individuals occupying positions of greater power tend to evaluate others primarily in terms of their utility for personal aims and, compared to low-power individuals, exhibit a stronger tendency to objectify them. As the authors put it, for power holders, the world is viewed through an instrumental lens, and approach is directed toward those individuals who populate the useful parts of the landscape. When combined with the reduced interpersonal sensitivity observed among the powerful, this instrumental orientation helps explain the emergence of objectifying behavioral tendencies among the powerful. Subsequent research has provided further support for this line of evidence. Gwinn and colleagues (2013) found that individuals in positions of power are more likely to attribute fewer uniquely human traits to those in subordinate roles, reflecting a form of dehumanization. This finding suggests that power can produce a perceptual

and moral disconnection: the powerful “see” less of the humanity of the powerless, reducing the cognitive and emotional complexity with which others are represented, even in the absence of overt hostility. Interestingly, Civile and Obhi (2016) extended this line of inquiry to the perceptual and sensory domain. The authors found that when men and women are induced to feel powerful, they tend to process sexualized images of the opposite sex in a featural manner—that is, by focusing on isolated body parts rather than the configuration as a whole—while continuing to perceive members of their own sex configurally, as coherent human beings. In other words, power not only reduces social perspective-taking but can also shift perception toward a mode typically reserved for objects, thereby promoting the sexual objectification of the opposite gender. This effect indicates that power operates at a deep cognitive level, influencing even basic perceptual mechanisms. Together these contributions delineate a coherent picture: power functions as an amplifier of goal-directed motivation and psychological distance, while simultaneously fostering cognitive egocentrism, dehumanization, and objectification.

Socioeconomic inequalities

It is well established that economic inequality profoundly shapes individual and social thought and behavior (e.g., Wilkinson & Pickett, 2017). In highly unequal contexts, disparities in income and status become more salient, intensifying the pursuit of money, self-affirmation, and social status (Peters et al., 2022; Jetten et al., 2017; Wang et al., 2022). When such goals become salient, individuals naturally focus on the means—objects and people—that help achieve them (Fitzsimons et al., 2009; Shah & Kruglanski, 2003). Recent evidence shows that experiences of personal relative deprivation, a psychological response closely tied to perceived inequality and upward comparison, further strengthen this instrumental orientation by increasing exchange-based, cost–benefit mindsets that promote objectification (Zheng et al., 2025). Cheng et al. (2022, 2024) examined whether perceived economic inequality fosters

treating others instrumentally. In contexts of high perceived inequality, people prefer partners useful for achieving self-affirmation goals and evaluate others more in terms of utility than relational qualities. This occurs even without immediate personal benefit, suggesting that inequality activates a generalized drive for self-enhancement. Their 2024 studies show that perceived inequality increases adoption of a calculative mindset, which in turn promotes objectification, reduces prosociality, and increases exploitative intentions. Overall, economic inequality appears to encourage a utilitarian approach to others, fostering interpersonal objectification.

The use of technology

Technology, especially AI-driven systems, is reshaping social relations and self-perception. Its pervasiveness blurs boundaries between humans and machines, generating new forms of dependence, control, and identity reconfiguration. Research links technology use to risks for psychological and social well-being (e.g., Mayiwar et al., 2024; Twenge & Campbell, 2018; Zsila & Reyes, 2023). Recent studies have highlighted how the diffusion and use of intelligent technologies may provide fertile ground for processes of objectification. Oviatt (2021) argues that contemporary technology is increasingly functioning as an infrastructure of dehumanization. According to the author, pervasive systems of digital surveillance and automation, originally designed to optimize productivity and control, ultimately erode human autonomy and subjectivity, fostering a condition in which individuals come to perceive themselves as replaceable components within a technological system. The continuous observation and quantification of behavior, across educational and professional domains alike, undermine freedom of choice and personal authenticity, while encouraging anxiety, conformity, and passivity. In this way, technology contributes to the transformation of individuals into predictable and manageable objects, whose identities are defined by their performance and by the data they generate. This instrumental reduction of the individual is particularly evident in

the realm of social media. Chen (2025), in an empirical study, demonstrates that intensive and passive use of social networking platforms significantly heightens appearance-related anxiety and self-objectification. Users learn to perceive themselves as visual objects to be evaluated and optimized, conforming to unrealistic aesthetic and social ideals. Within this context, the individual becomes a symbolic commodity, exposed to constant cycles of comparison, validation, and exchange, where personal worth is quantified through visibility, “likes,” and interactions. Similarly, Palermos (2023) examines how the design of major digital platforms—such as Instagram and Tinder—encourages objectifying and self-objectifying behaviors through specific digital affordances: the “swipe” logic, appearance-driven algorithmic feeds, and mechanisms of instant gratification (notifications, hearts, matches). These design features predispose users to perceive others as means of emotional, social, or sexual gratification rather than as people endowed with subjectivity and depth. At the same time, self-presentation becomes a form of self-marketing, in which the body, identity, and intimacy are strategically optimized to attract attention or approval. Such dynamics give rise to a relational commodification, where the value of others depends on their capacity to satisfy affective needs, validate social status, or elicit desire. In their systematic review, Wu and Wang (2025) identify three psychological mechanisms through which artificial intelligence can foster objectification: internalization of beauty ideals, social comparison, and diminished perception of humanity. Algorithms reproduce biased, sexualized stereotypes, and emotionally engaging interfaces encourage treating others as objects while shaping identity around efficiency and desirability. Moreover, anthropomorphic AI systems blur distinctions between human and artificial agents, fostering emotional attachments and deepening self- and other-objectification.

Individual factors

Materialism

Material wealth is a central indicator of socioeconomic status (Veblen, 1899) and a primary life goal, particularly for younger generations (Twenge et al., 2012). Cross-generational studies indicate that the importance attributed to money and social image has increased over time, with Millennials exhibiting higher materialism than Generation X or Baby Boomers (Twenge et al., 2012; Twenge & Kasser, 2013). Materialistic values, reflecting the emotional and symbolic weight of wealth, consistently predict both interpersonal and self-directed forms of objectification. Wang & Krumbhuber (2016) showed that individuals with strong materialistic orientations tend to perceive relationships instrumentally, prioritize useful partners over relationally meaningful ones, attribute fewer mental states to irrelevant targets, and show increased destructive behaviors toward non-human entities, effects that persist even when controlling for socioeconomic status and power. Materialism is also associated with lower empathy and prosociality and greater social distance (Kasser, 2002). Beyond interpersonal relations, materialism also shapes self-perception in the direction of the self-objectification by contributing to the internalization of an objectifying gaze toward oneself. Experimental evidence shows that situational activation of materialistic values increases body surveillance and state self-objectification, particularly in women (Teng et al., 2016a). Moreover, exposure to media content emphasizing wealth and social status further reinforces this link, intensifying the tendency to view physical appearance as a mean for achieving social success (Vandenbosch, & Eggermont, 2015). Materialism further extends its influence into digital social contexts. Highly materialistic individuals use social media not only for social engagement but as a tool for self-regulation, pursuing goals related to possession, status, and social comparison. They are more likely to maintain larger networks, compare themselves with others, objectify online friends, and to see them as “digital possessions” (Ozimek et al., 2017; Raguso et al., 2024). In

sum, materialism emerges as a powerful individual factor that shapes how people perceive, relate to, and use others, both offline and online, promoting instrumental attitudes, objectification and self-objectification.

Self-Oriented Motivations: Pro-Self and Exchange Orientation

While materialism primarily reflects the symbolic value of possessions and status, other self-centered individual dispositions also foster objectifying tendencies in interpersonal relationships. Among these, pro-self orientation and exchange orientation represent two complementary yet distinct motivational frameworks that prioritize self-interest and utility maximization over mutuality and connection. Both share a logic of instrumental rationality, in which others are perceived not as ends in themselves but as means for achieving personal goals. According to Giacomantonio and colleagues (2025), a pro-self orientation manifests as the tendency to maximize one's own benefits, even at others' expense. This motivational style promotes an objectifying view of both others and relationships: the partner is seen as a useful object, and the relationship as a functional means to an end. Such objectification, directed toward both the other and the bond itself, mediates the shift from egoistic motivation to competitive behavior, providing moral justification for reduced empathy and reciprocity. Wang et al. (2022) further elaborate on exchange orientation, defined as the tendency to evaluate relationships in terms of costs and benefits, with expectations of immediate reciprocity. Although typical of non-intimate interactions, this mindset can infiltrate romantic relationships, altering their nature. The authors show that adopting an exchange orientation leads individuals to value the partner's utility and to perceive them as a tool for attaining personal aims. This calculative approach, a form of interpersonal objectification, is driven by the desire to maximize personal gain. In other words, exchange orientation activates a transactional mentality that privileges instrumental traits over relational qualities such as kindness or shared values. Pro-self and exchange orientations, thus, seem to foster an instrumental approach to others, a core

dimension of objectification. The other becomes a means, the relationship a transaction, and human connection loses depth.

Dark Triad

The Dark Triad comprises three interrelated socially aversive personality traits: Machiavellianism, psychopathy, and narcissism (Paulhus & Williams, 2002). Although distinct, these traits share a common interpersonal core characterized by emotional coldness, disagreeableness, lack of humility, a short-term (rather than long-term) mating orientation, aggressiveness, preference for immediate rewards, and a broadly malevolent social style (Schimmenti et al., 2017). Converging lines of evidence suggest that the Dark Triad reliably predisposes individuals to objectify others, perceiving them primarily as instruments for personal ends. Schimmenti et al. (2017) demonstrated that the Dark Triad is associated with empathic deficits and difficulties in recognizing and regulating emotions (alexithymia), which in turn undermine the capacity to perceive others as sentient agents with independent mental states. This emotional detachment facilitates the denial of subjectivity and legitimizes manipulative and instrumental forms of social behavior. More specifically, psychopathy is linked to impulsivity and moral insensitivity, whereas narcissism introduces exploitative motives and a craving for admiration, both of which are inherently compatible with objectification. Consistently, findings by Lachowicz et al. (2021, 2025) indicate that the propensity to objectify others is strongly related to narcissistic dimensions, particularly egocentrism (vulnerable narcissism) and the demand for admiration (grandiose narcissism). These traits orient individuals toward self-centered goal pursuit while disregarding others' needs, thereby fostering the treatment of people as tools for personal gratification. Moreover, characteristics such as entitlement and exploitativeness emerge as unique predictors of objectification, suggesting that the drive to exploit others and the conviction of deserving more than others jointly promote a utilitarian conception of interpersonal relations.

Attachment and relational insecurity

Attachment theory provides a foundational framework for understanding how early interpersonal experiences shape adult socio-emotional functioning and relational cognition. Early interactions with caregivers form internal working models of the self and others that remain relatively stable throughout life and guide affective, cognitive, and behavioral responses in relationships (Bowlby, 1969, 1982; Mikulincer & Shaver, 2017). Insecure attachment, manifesting as anxiety or avoidance, has been consistently linked to emotional dysregulation, impaired trust, and reduced capacity to perceive others as autonomous subjects. Recent research has begun to connect attachment dynamics with objectification processes, revealing that attachment insecurity may predispose individuals to perceive and treat others as mere instruments for personal gratification. Building on Landau et al.'s (2012) Subjectivity Uncertainty Theory, objectification can be understood as a strategy for managing interpersonal uncertainty. When individuals struggle to interpret or anticipate others' thoughts and emotions, they may defensively reduce others' subjectivity to tangible, controllable dimensions—such as physical appearance, functionality, or social utility. Within this framework, objectification is not merely an expression of dominance or hostility but also a maladaptive attempt to restore predictability and control in the social environment. Attachment avoidance appears particularly relevant in this regard. Avoidantly attached individuals, who habitually deactivate their attachment system and suppress emotional intimacy, may experience heightened discomfort with others' subjectivity and thus rely on instrumental or depersonalized perceptions of others. Conversely, anxiously attached individuals, preoccupied with reassurance and closeness, may oscillate between idealizing others and internalizing objectified views of the self as a strategy for maintaining relational bonds (Mikulincer & Shaver, 2013). Empirical evidence supports these conceptual links. Jiao et al. (2022) found that interpersonal sexual objectification and self-objectification are positively related to attachment anxiety and avoidance. Their longitudinal

data showed that attachment anxiety predicts increased self-objectification over time, suggesting that insecure attachment fosters vulnerability to an objectifying culture by undermining self-worth and relational security. Extending these findings, Calkins et al. (2023) proposed an integrated framework linking attachment insecurity to the enactment and experience of objectification. They demonstrated that avoidantly attached individuals—who tend to maintain emotional distance—are more likely to objectify others, whereas anxiously attached individuals are more prone to self-objectify, seeking affirmation through appearance and approval. Together, these findings suggest that attachment-related vulnerabilities contribute to both sides of the objectification process.

Building on these theoretical and empirical premises, and in collaboration with a research group from SWPS University (Wroclaw), we conducted three correlational studies ($N = 1,222$) across Poland, the United Kingdom, and Italy (Ecer et al., 2025), examining objectification as a broader interpersonal phenomenon, extending beyond sexual or role-specific contexts, and by uncovering the psychological mechanisms underpinning the link between attachment insecurity and objectification. Specifically, we focused on Theory of Mind (ToM) and empathy, two socio-cognitive capacities essential for recognizing others as sentient and intentional beings. Across all studies, we consistently found that higher levels of attachment avoidance predicted stronger tendencies to objectify others, and that this relationship was mediated by reduced ToM (Studies 2 and 3) and empathy (Study 3). These findings extend previous evidence by showing that attachment insecurity, particularly avoidance, is not only linked to self-related vulnerabilities but also plays a central role in shaping how individuals perceive and relate to others at a fundamental interpersonal level, through mechanisms that erode the perception of others as fully human.

The evidence reviewed in this chapter reveals interpersonal objectification as a subtle yet deeply pervasive undercurrent of contemporary social life. Rather than being confined to

specific situations or domains, it emerges at the intersection of cultural, structural, and psychological factors. Money, power, inequality, and technology create contexts that encourage a calculative, instrumental approach to relating with others—one that privileges utility over humanity. Simultaneously, individual dispositions such as materialism, self-centered motives, dark personality traits, and attachment insecurity fuel this tendency from within, progressively eroding empathy and the capacity to recognize others as thinking, feeling beings. Together, these external and internal dynamics constitute a self-reinforcing system that normalizes relational detachment and emotional distance.

1.6 – Moving beyond the phenomenon: Toward protective mechanisms in objectification research

As illustrated in this chapter, objectification constitutes a widespread and pervasive psychological and social process that manifests in both explicit and subtle forms within everyday interactions. As discussed, this process produces profoundly negative consequences at the physical, psychological, and social levels, affecting both individuals and society. Precisely because of its pervasiveness and its harmful effects, it becomes crucial not only to understand its underlying mechanisms but also to identify which psychological and social resources might prevent or counteract it, in other words, to uncover the protective factors against objectification.

Despite extensive research on the causes and consequences of objectification, studies on protective factors remain surprisingly limited. Most contributions have focused on sexual and self-objectification, proposing potential buffers such as high self-esteem (Gattino et al., 2023), physical activity, self-compassion, and body acceptance (Daniels et al., 2020), body appreciation and a positive body image (Davies et al., 2020; Lee, 2025), or digital pruning, namely the selective and critical use of social media to avoid harmful content (Tylka et al.,

2023). Other work highlights the role of media education and activism (McKay, 2013), as well as psychoeducational interventions promoting a more humanizing representation of individuals based on mental and moral qualities rather than physical appearance (Briñol et al., 2017).

In the workplace domain, Auzoult (2020) proposed that attributing greater meaning and value to one's work can buffer the effects of organizational objectification, whereas Baldissarri et al. (2017) suggested that reducing perceived alienation and strengthening one's sense of belonging and recognition decreases the tendency to perceive oneself and others as mere instruments of labor. Similarly, Riley et al. (2021) proposed that mutual support, empathic leadership, and personal appreciation may act as buffers against experiences of objectification and work-related stress. Recent findings further indicate that job and personal resources, such as a balanced relationship between job challenges and individual skills, organizational identification, trust, and perceived meaningfulness of work, are associated with higher flow and well-being and, critically, with lower levels of self-objectification, highlighting additional mechanisms through which workplace environments may protect individuals from objectifying experiences (Marini et al., 2025; Teresi et al., 2024). More broadly, other studies suggest that high-quality interpersonal relationships can mitigate the impact of an objectifying culture (Jiao et al., 2022), and that reflective or mindfulness-based practices may help restore authenticity and a coherent sense of self after objectifying experiences (Cheng et al., 2022).

To date, the only empirically identified protective factor against this form of objectification is gratitude. Shi et al. (2022) demonstrated that both dispositional and state gratitude reduce the propensity to objectify others by shifting attention away from self-centeredness and toward the recognition of others' minds, needs, and intrinsic worth. In other words, gratitude fosters prosocial orientation and promotes seeing others as whole persons rather than as means for one's goals. Along similar lines, Qiu et al. (2025) showed that gratitude

not only reduces enacted objectification but also buffers the psychological impact of being objectified, particularly by attenuating experiences of social pain.

Despite these promising findings, the literature remains fragmented and lacks theoretically grounded, experimentally validated interventions. Empirical evidence is still insufficient to assess the effectiveness of protective factors across contexts or to understand how situational variables may shape their influence. And this is precisely the direction that inspires the present work.

More specifically, the main of the present research project is to empirically verify the role of ToM as a broad protective factor against interpersonal objectification, both within adult and young populations. Moreover, this work explores how certain contextual conditions might weaken this protective effect, thereby contributing to a more comprehensive and dynamic understanding of the processes that counteract objectification in human relationships. In doing so, the present work seeks to contribute to opening a new line of inquiry focused not only on understanding the mechanisms that generate objectification but also, and most importantly, on identifying the psychological and social strategies that can prevent it and reduce its impact in everyday life.

Methodological issues: operational heterogeneity in interpersonal objectification

A crucial methodological issue concerns the operationalization of interpersonal objectification, which has been defined and measured in markedly heterogeneous ways across the literature. Previous work has conceptualized interpersonal objectification as perceiving others as lacking mental states (e.g., Wang & Krumhuber, Study 4), seeing them as resembling objects rather than human beings (i.e., objectification of the other; Andrighetto et al., 2017), focusing on their goal-oriented or instrumental characteristics (Landau et al., 2012; Teng et al., 2016), or construing social relationships in utilitarian, means–ends terms (i.e., objectification of the relation; Lachowicz-Tabaczek et al., 2021). Although this diversity has enriched the

theoretical debate, it has also produced considerable conceptual fragmentation, complicating efforts to establish a unified account of what interpersonal objectification entails. In light of this heterogeneity, the present research program adopted a deliberately broad operational strategy aimed at maximizing the generalizability and robustness of the findings. Across the nine studies, interpersonal objectification was assessed using complementary approaches: individuals' tendencies to perceive or treat others as objects, their inclination to construe relationships in instrumental terms, and their focus on goal-relevant features of interaction partners (see Table 1.1). This multimethod framework enabled a rigorous test of the consistency of the observed effects across distinct measurement traditions, analytic levels, and situational contexts, thereby strengthening confidence in the overall conclusions.

Table 1.1

Overview of interpersonal objectification aspects and measures across studies

Study	Aspects of interpersonal objectification	Measures
Study 1	- Objectification of the relation - Objectification of the other	- Relations Objectification Scale (Lachowicz-Tabaczek et al., 2021) - Others' Objectification Scale (Andrighetto et al., 2017)
Study 2a and 2b	- Objectification of the relation - Objectification of the other - Goal-oriented perception of others	- Relations Objectification Scale (Lachowicz-Tabaczek et al., 2021) - Others' Objectification Scale (Andrighetto et al., 2017) - Ad hoc created goal-instrumentality task
Study 3	- Objectification of the relation - Behavioral objectification tendency	- Relations Objectification Scale (Lachowicz-Tabaczek et al., 2021) - Ad hoc created social dilemma scenarios
Study 4, 5a, 5b, 6 and 7	- Objectification of the relation - Nussbaum's dimension of objectification	- Relations Objectification Scale (Lachowicz-Tabaczek et al., 2021) - Objectification Scale (Belmi & Schroeder, 2021)

CHAPTER 2

THEORY OF MIND AS A SHIELD AGAINST INTERPERSONAL OBJECTIFICATION

2.1 – Mind and emotional perception: A fundamental aspect of recognizing others as human

The previous chapter highlighted that objectification is not merely a social phenomenon but a complex cognitive process rooted in the mechanisms that allow us to recognize others as human. To understand objectification and identify potential protective mechanisms, it is essential to examine how individuals perceive others and particularly the qualities that distinguish human beings from objects.

Research in social cognition has shown that we treat others according to the mental qualities and capacities we perceive in them, yet these attributes are not ascribed equally to all individuals. Indeed, people do not necessarily recognize in others a fully experiencing mind and, consequently, do not always perceive them as fully human. Seminal work by Gray and colleagues (2007) demonstrated that mind perception is structured along two dimensions (agency and experience) highlighting that targets are attributed varying degrees of intentionality, self-control, and emotional capacity. Recognizing someone as fully human thus requires acknowledging both their cognitive states and their emotions (Fiske, 2009). As Harris and Fiske (2011) argue, dehumanization entails a failure to consider another person's inner life.

Social neuroscience research supports this view by showing that perceiving others' minds consistently recruits specific brain regions, especially the medial prefrontal cortex (Amodio & Frith, 2006; Fiske & Tamir, 2025). Early neuroimaging work focused on groups located in the low competence–low warmth quadrant of the stereotype content model, such as poor individuals, homeless people, and drug addicts (Fiske et al., 2007). When participants viewed faces representing each quadrant, images of those seen as disgusting activated the

insula, as expected, but, unlike typical social cognition tasks, failed to activate the medial prefrontal cortex. Activation for these targets was roughly half that observed for the other quadrants. Further studies by Harris and Fiske (2006, 2007, 2009) confirmed that medial prefrontal cortex engagement tracks perceived humanity. Groups regarded as disgusting or morally devalued elicit reduced activation in this region, reflecting a breakdown in mental state attribution. This neural attenuation corresponds with behavioral indicators of dehumanization: participants tend not to use intentional verbs to describe these individuals, fail to attribute internal states, and report unwillingness to interact with them (Harris & Fiske, 2009). Familiarity and perceived similarity, by contrast, enhance medial prefrontal cortex activation, whereas social distance diminishes it (Harris & Fiske, 2011). A similar pattern emerges in the perception of sexually objectified individuals. In one study, participants viewed images of partially or fully clothed men and women with visual parameters carefully controlled. In a surprise memory test, male participants more accurately recalled partially clothed female bodies. Recognition scores correlated with activation in a network associated with object manipulation, a relationship not observed for other targets. Moreover, higher hostile sexism predicted reduced right medial prefrontal cortex activity when viewing sexualized female bodies, suggesting diminished mentalizing toward them, as though they were seen more as objects than persons (Cikara & Fiske, 2011).

The perception of others' humanity is also closely linked to the degree to which they are considered morally worthy, and it appears to play a key role in either justifying or inhibiting harmful actions toward them. According to theories of shared representations, empathizing with others involves activating neural systems engaged when experiencing similar affective states oneself. A stronger perception of another person as a being endowed with mental and emotional states therefore supports a more embodied simulation of the consequences of harm, increasing reluctance to inflict it (Majdandžić et al., 2012).

In summary, neuroscientific and psychological evidence indicate that perceiving others as human depends on the extent to which we activate mechanisms for recognizing and representing their mental and emotional states. When these processes fail, various forms of dehumanization, such as objectification, can arise, increasing the likelihood of harmful or exploitative behaviors toward others. It follows that effectively countering these phenomena requires addressing their cognitive foundation: the capacity to recognize others' mental and emotional states—what is known as the Theory of Mind.

2.2 – Cognitive, social, and neural dimensions of Theory of Mind

Theory of Mind (ToM) refers to the ability to infer, recognize, and attribute mental and emotional states to oneself and others, such as beliefs, intentions or emotions, and to use this information to explain, predict, and interpret behavior. As a core component of social cognition, it enables the construction of complex representations of the interpersonal world and supports the regulation of social interactions (Premack & Woodruff, 1978). Within this broad function, two interrelated roles can be distinguished: a social one, which facilitates cooperation, empathic understanding, and the management of interpersonal relationships (Frith & Frith, 2006); and an adaptive one, which allows individuals to flexibly adjust their behavior according to others' mental states and contextual demands (Apperly, 2012). ToM thus integrates linguistic, emotional, attentional, and executive systems and contributes to morality, empathy, and prosocial tendencies (Decety & Jackson, 2004).

Indeed, by enabling individuals to represent others' internal states, a well-developed ToM has been consistently associated with a broad range of relational, cognitive, and moral benefits that foster social adaptation and individual well-being. From early childhood, higher ToM correlates with prosocial behaviors such as helping, sharing, and comforting (Imuta et al., 2016; Qiu et al., 2024), as well as with enhanced social skills, cooperation, and group inclusion

(Fink et al., 2015; Wellman, 2018). Across the lifespan, it supports the quality of close relationships, favoring more stable and empathic friendships and romantic bonds (Dodell-Feder et al., 2015), and promotes cooperation, negotiation, and leadership in group and workplace contexts (Hughes & Leekam, 2004). Moreover, by fostering sensitivity to others' experiences, ToM contributes to moral empathy, reduced prejudice, and inclusive social attitudes (Glidden et al., 2020).

The concept of ToM was first introduced by Premack and Woodruff (1978) to describe chimpanzees' capacity to attribute intentions to others' behavior, suggesting an evolutionarily conserved ability. In humans, systematic investigation began in the 1980s with developmental studies. Wimmer and Perner's (1983) *False Belief Task* demonstrated that children around age four understand that others can act on mistaken beliefs and established the basis for subsequent developmental research. Baron-Cohen, Leslie, and Frith (1985) used the same paradigm to show specific impairments in children with autism spectrum disorder, highlighting the link between ToM and atypical social cognition. In the 1990s, the rise of neuroimaging methods opened the way for studying the neural mechanisms underlying ToM. A pivotal discovery was that of mirror neurons by Rizzolatti and colleagues (1996, 2001), located in the premotor cortex, posterior parietal regions, and Broca's area. These neurons activate both when performing an action and when observing another perform it, suggesting an automatic simulation mechanism that provides immediate, embodied access to others' actions and intentions. This discovery fueled theories proposing that social understanding arises from embodied simulation processes that complement inferential mindreading (Gallese & Goldman, 1998; Gallese, 2007). Subsequent research confirmed that ToM depends on a distributed neural network including the medial prefrontal cortex, temporo-parietal junction, precuneus, and superior temporal sulcus (Frith & Frith, 2006). Mirror mechanisms have been shown to encode not only how an action is performed but also why, with context-dependent actions eliciting stronger activation in

premotor areas (Iacoboni et al., 2005). Such findings underscore the role of sensorimotor and affective systems in translating action perception into inferences about intentions, emotions, and internal states (Adolphs, 2003).

Cognitive and affective ToM's dimensions

It is evident that ToM represents a broad and multifaceted capacity that encompasses a variety of cognitive mechanisms and relies on the coordinated functioning of multiple brain regions. It relies on the coordinated activation of distributed neural networks involved in both propositional reasoning and the comprehension of emotional and intentional states. In the literature, two interdependent but functionally distinct dimensions are typically distinguished: a cognitive component and an affective component of ToM (Decety & Jackson, 2016; Dvash & Shamay-Tsoory, 2014; Shamay-Tsoory & Aharon-Peretz, 2007). Cognitive ToM refers to the inferential processes that allow individuals to represent and understand what another person thinks, knows, intends, or believes. It enables, for example, the attribution of false beliefs or the prediction of others' behavior based on their mental representations. Neuroimaging studies have consistently shown the involvement of regions such as the medial prefrontal cortex, the dorsolateral prefrontal cortex, and the temporoparietal junction (Saxe & Kanwisher, 2013; Rothmayr et al., 2009). In particular, the dorsolateral prefrontal cortex is implicated in cognitive control and inhibitory processes that allow individuals to distinguish their own knowledge from that of others, while the temporoparietal junction and the medial prefrontal cortex are critical for reasoning about others' beliefs and intentions (Rothmayr et al., 2009). Affective ToM, on the other hand, concerns the ability to attribute emotional states, feelings, or affective dispositions to others—that is, to infer how another person feels rather than merely what they think. This dimension involves a distinct neural circuit that includes the orbitofrontal cortex, the ventromedial prefrontal cortex, and the amygdala (Shamay-Tsoory et al., 2009). According to Dvash and Shamay-Tsoory (2014), affective ToM is grounded in emotional simulation

processes and interoceptive integration mechanisms that allow one to “resonate” with another’s affective experience. Additionally, the basal ganglia appear to contribute to this dimension as a motor-simulation substrate, mediating the integration of bodily perception, movement, and emotional response (Molenberghs et al., 2012).

Despite their partly distinct neural substrates, these two components operate in close functional interdependence. A large meta-analysis by Schurz et al. (2021) demonstrated that mental state understanding follows a multilevel hierarchical organization: higher-level cognitive and affective processes coexist but converge into hybrid forms at lower levels, especially in complex or ecologically valid contexts requiring simultaneous inference of intentions and emotions. Consistent with this view, Preckel et al. (2018) showed that the interaction between socio-cognitive and socio-affective systems enables flexible and adaptive social behavior. Critical to this integration is the ability to distinguish self from others, supported by the right temporoparietal junction and supramarginal gyrus, which maintain the functional balance between the two ToM components. Overall, ToM emerges as a multifaceted, hierarchically organized construct in which cognitive and affective dimensions are anatomically distinct yet dynamically integrated, enabling a comprehensive and adaptive understanding of others’ mental and emotional states.

Theoretical overlap between Theory of Mind and empathy

For the purposes of the present research project, it is important to acknowledge a longstanding conceptual issue in the study of socio-cognitive processes: the substantial overlap between ToM and empathy. Although contemporary models often distinguish between cognitive and affective components, these constructs have historically evolved in parallel across different research traditions—cognitive developmental psychology on one hand, and social, clinical, or affective psychology on the other—resulting in a theoretical landscape marked by persistent ambiguities.

A wide body of literature demonstrates that ToM and empathy share core representational mechanisms for interpreting, predicting, and responding to others' mental states (Decety & Jackson, 2004; Zaki & Ochsner, 2012). Cognitive empathy closely resembles cognitive ToM, both involving the capacity to infer beliefs, intentions, and emotions from available cues. Similarly, affective empathy and affective ToM (or "emotional mentalizing") recruit overlapping neural systems, particularly the anterior insula, anterior cingulate cortex, and temporo-parietal areas (Bernhardt & Singer, 2012; Kanske et al., 2015). This convergence reflects how the two literatures have addressed similar questions using different terminologies and measurement paradigms (Keysers & Gazzola, 2014).

The absence of clear, universally accepted boundaries between ToM and empathy stems from this conceptual and empirical overlap. Some frameworks treat empathy as encompassing both affective resonance and cognitive inference; others position ToM as the broader construct, subsuming belief reasoning and emotional state attribution. Distinctions between the two often depend more on disciplinary conventions than on established empirical dissociations. Recent multidimensional models propose that ToM and empathy form complementary components of a broader socio-cognitive architecture. Dvash and Shamay-Tsoory (2014) argue that cognitive empathy and ToM share prefrontal and temporal structures, whereas affective empathy engages limbic and insular regions associated with emotional simulation. Neuroanatomical evidence supports this view: individual differences in the structure and connectivity of the insula, parietal cortex, and somatosensory regions predict variability in both empathic responsiveness and emotional state attribution (Banissy et al., 2012).

Considering this theoretical overlap, the present project focuses specifically on ToM for both conceptual and methodological reasons. ToM provides a well-defined cognitive framework for examining how individuals represent others' internal states, a central aspect to understand objectification as a failure of mental state attribution. Moreover, unlike empathy,

ToM paradigms offer standardized and validated tools for isolating inferential processes without conflating them with affective reactivity. This targeted focus enables a more precise investigation of the cognitive mechanisms linking mental state attribution to interpersonal perception and objectification.

2.3 – The development of Theory of Mind and its related deficits

ToM is a dynamic socio-cognitive capacity that emerges early in life and progressively refines across childhood, adolescence, and adulthood through the interplay of biological maturation, linguistic exposure, and social experience. Its earliest precursors can already be observed in infancy within mother–infant interactions: joint attention, pointing gestures, referential gaze, and early imitation support the recognition that others possess intentions and perspectives distinct from one’s own (Meltzoff, 2007; Tomasello, 1999). Symbolic play likewise provides an early window into children’s capacity to represent others’ actions and motivations (Santrock, 2021).

Longitudinal research describes ToM development as unfolding through identifiable stages. Around the age of two, during the “desire psychology” phase, children begin referring to their own and others’ internal motivations. By three years, during the “desire–belief psychology” phase, they understand that actions are guided by beliefs conceived as true representations of reality (Wellman, 2014). A major milestone occurs around age four, when children typically succeed in first-order false-belief tasks, acknowledging that mental representations can diverge from the actual state of the world (Wimmer & Perner, 1983). Between six and seven years, children acquire second-order reasoning, understanding nested mental states such as “I think that you think that he believes...,” enabling more complex socio-cognitive operations including deception, irony, and strategic communication (Perner & Wimmer, 1985). These stages are consistent with the distinction between first-order ToM—

inferring thoughts and intentions—and second-order ToM—representing what one individual thinks about another’s beliefs (Bosco et al., 2014). Numerous studies have shown that children begin to succeed in first-order ToM tasks around ages 3–4 (Wimmer & Perner, 1983) and in second-order reasoning tasks around ages 6–7 (Perner & Wimmer, 1985).

While most early studies focused on the period between ages 2 and 7, more recent evidence indicates that ToM continues to develop during preadolescence and adolescence, stages characterized by profound physical, hormonal, and cognitive changes (Coleman, 2011). Neurodevelopmental changes, especially in the prefrontal cortex and temporo-parietal junction, support increasingly sophisticated reasoning about ambiguous, ironic, or conflicting mental states (Dumontheil et al., 2010). Developmental assessments with adolescents show steady improvements in mentalizing complexity, suggesting that ToM continues to mature throughout adolescence (Bosco et al., 2014). Electrophysiological evidence similarly reveals protracted maturation of frontal regions crucial for mental-state attribution, indicating ongoing reorganization of cognitive systems mediating ToM (Moriguchi et al., 2007).

Alongside biological maturation, ToM is profoundly shaped by environmental and relational contexts. The family represents an influential developmental environment: exposure to conversations rich in mental-state language (references to beliefs, desires, and emotions) predicts stronger ToM performance (Ruffman et al., 2002, 2018). Shared reading that highlights characters’ internal states likewise fosters mentalizing abilities (Adrian et al., 2005). Early attachment quality plays an additional role: maternal mind-mindedness and secure relationships predict superior understanding of mental states (Meins et al., 2002).

As children grow, peer interactions become critical. Mental-state understanding is associated with greater peer acceptance and prosocial behavior, and with lower levels of aggression and relational difficulties (Gómez-Garibello & Talwar, 2015; Slaughter et al., 2015; Weimer et al., 2017, 2021). Recent longitudinal evidence further demonstrates that classroom

composition influences children's ToM development: heterogeneity in classmates' mentalizing abilities, rather than average ToM level, predicts growth, likely because diversity in perspectives stimulates reflection on subjective interpretations of thoughts and behaviors (Lecce et al., 2024).

Cultural factors introduce additional variation. Although the general sequence of ToM milestones is similar across Western populations, children from Asian or Middle Eastern contexts may follow different developmental trajectories. For example, Iranian children acquire knowledge-access understanding before diverse-belief understanding, reversing the order typically found in Western samples (Shahaeian et al., 2011). Such differences are often linked to cultural emphasis on harmony, cooperation, and social learning. Moreover, the developmental advantage associated with sibling presence varies across cultures, depending on the degree to which mental-state discourse is encouraged within the family (Hou et al., 2020). Collectively, these findings emphasize that ToM emerges from an interactive developmental system shaped by biological readiness, language, attachment, peer dynamics, and culturally specific practices.

Although ToM typically follows a robust developmental trajectory, several clinical conditions present atypical or impaired mental-state understanding, with consequences for social functioning, emotional regulation, and interpersonal relationships. Autism Spectrum Disorders (ASD) constitute the most widely studied case: classic research (Baron-Cohen et al., 1985) shows marked difficulties in both cognitive and affective components of ToM, reflected in failures on false-belief tasks and challenges in interpreting beliefs and emotions. Early atypicalities in joint attention further distinguish ASD trajectories (Charman, 2003). Yet recent findings highlight substantial heterogeneity, with many individuals—despite performing adequately on explicit tasks—showing persistent impairments in implicit, spontaneous

mentalizing in real-life contexts (Rosello et al., 2020). Thus, ASD reflects not a complete absence of ToM but a distinct, often rigid, pattern of social information processing.

Pronounced ToM deficits also characterize psychotic disorders, especially schizophrenia. Frith's (1992) model links symptoms such as delusions and hallucinations to aberrant mental-state attribution, and empirical work shows a tendency to misinterpret neutral actions as hostile (Brüne, 2005). Meta-analyses consistently report medium-to-large ToM impairments, particularly in cognitive inference tasks, with strong associations to symptom severity and reduced social functioning (Bora et al., 2009, 2016; Pickup, 2008).

Neurodegenerative disorders show differentiated profiles of ToM decline. In Alzheimer's disease, basic mentalizing is relatively preserved, while second-order reasoning, executive-dependent ToM, and recognition of complex or negative emotions deteriorate with disease progression (Cuerva et al., 2001; Gregory et al., 2002). By contrast, frontotemporal dementia (FTD) produces more pervasive socio-cognitive deficits, including impaired understanding of humor, deception, and higher-order beliefs (Lough et al., 2001; Snowden et al., 2003). Similar impairments are documented in Huntington's disease and, to a lesser extent, amyotrophic lateral sclerosis, often linked to frontostriatal degeneration and executive dysfunction (Allain et al., 2011; Lagravinese et al., 2017; Palumbo et al., 2022).

Finally, major depressive disorder is associated with difficulties in complex belief-inference tasks, characterized by negative interpretative bias and reduced accuracy in decoding social cues (Bora & Berk, 2016; Cusi et al., 2013). These impairments tend to be state-dependent—worsening during acute episodes and improving with remission (Weightman et al., 2014)—and appear related to altered connectivity between prefrontal and limbic systems, which disrupt flexible interpretation of others' mental states (Schurz et al., 2021; Hiser & Koenigs, 2018).

2.4 – Individual variability and determinants of Theory of Mind

Beyond age-related developmental milestones and clinical conditions affecting ToM emergence, substantial interindividual variability is also evident under typical developmental conditions. In adults, the ability to represent others' mental and emotional states varies widely due to a complex interplay of neurocognitive, dispositional, and contextual factors, as well as to methodological variability in ToM measurement. Recent literature underscores that ToM is not a single, unified construct and cannot be directly or comprehensively measured. Instead, commonly used adult measures—such as the *Reading the Mind in the Eyes Test*, faux-pas tasks, perspective-taking paradigms, and implicit online tasks—tend to capture only partial and often non-overlapping components of ToM, leading to inconsistencies in estimates of individual variability (Yeung & Apperly, 2024). This heterogeneity has practical implications: many ToM tests show ceiling effects, limited sensitivity in neurotypical adults, and psychometric uncertainties, complicating the interpretation of associations between ToM and individual-level variables. As a result, part of the observed variability may reflect measurement differences rather than genuine functional differences, a critical issue when comparing studies using distinct paradigms (Conway et al., 2019).

Evidence for this concern comes from Warnell and Redcay (2019), who administered a broad battery of ToM tasks to preschoolers (4–6 years), school-age children (7–12 years), and adults. The battery varied in modality (verbal vs. nonverbal), content (affective vs. cognitive), prompt type (explicit vs. implicit), and complexity (from first- and second-order false-belief tasks to emotion-reading, faux-pas comprehension, and pragmatic inference). Across all age groups, performance showed substantial variability but no correlations across different tasks. High performance on one measure (e.g., *Reading the Mind in the Eyes Test*) did not predict performance on others (e.g., *Strange Stories* or false-belief task). Only conceptually similar tasks (e.g., different false-belief measures) correlated with each other, suggesting that coherence

emerges only when tasks assess nearly identical facets of ToM. This divergence in operational definitions makes it difficult to determine which individual differences reflect genuine ToM abilities and which stem from methodological artifacts.

Despite these challenges, several cognitive and contextual determinants of ToM are consistently identified. Verbal abilities and executive functions emerge as robust predictors of adult ToM performance. Linguistic competence, particularly vocabulary and complex syntax, explains substantial variance in false-belief tasks, likely because language provides symbolic tools and grammatical structures (e.g., propositional complements) needed to represent second-order mental states (Milligan et al., 2007). Executive functions also contribute: stronger working memory and inhibitory control are linked to better ToM performance in non-clinical samples, suggesting that maintaining multiple representations and inhibiting reality-based responses facilitate mental-state reasoning (Hughes & Ensor, 2007). Mahy et al. (2014) further showed that both younger and older adults perform worse under high inhibitory load, underscoring the role of interference control. The strength of these associations varies by task type: verbal and narrative tasks correlate more strongly with linguistic skills, whereas visuospatial or face-based tasks rely more heavily on perceptual and emotional abilities (Yeung et al., 2024). Clinical research converges on similar conclusions. In traumatic brain injury (TBI), ToM impairments partly reflect deficits in executive functioning, particularly working memory. Honan et al. (2015) found that ToM performance in TBI patients declined under high working-memory load but improved when cognitive demands were reduced, suggesting that some individual differences in ToM reflect underlying executive constraints.

Affective states also modulate ToM. Converse et al. (2008) showed that mood influences engagement of mental-state reasoning: sadness, associated with systematic processing, enhances ToM performance, whereas happiness, linked to heuristic processing, reduces it. This suggests that ToM is not entirely automatic but responsive to motivational and affective cues

that modulate cognitive control and inhibit egocentrism. Similarly, Balaban and Bilici (2022) found that anxiety impairs ToM, while mindfulness predicts better performance and buffers anxiety's detrimental effects. Pluck et al. (2021) reported that cortisol—an index of chronic stress—negatively correlates with ToM, pointing to a physiological pathway through which stress influences social cognition.

Personality traits also contribute to individual variability. A systematic review of 30 studies (Lotero & Londoño, 2019) indicates that ToM is negatively associated with several personality disorders—particularly borderline, antisocial, narcissistic, and avoidant—and correlates with alexithymia, emotional insensitivity, aggression, and maladaptive attachment styles. Adverse childhood experiences, such as trauma or punitive parenting, are likewise associated with reduced ToM. Research on the Dark Triad (Machiavellianism, psychopathy, narcissism) reveals a complex pattern: some studies find negative associations and higher alexithymia (Schimmenti et al., 2017), while others suggest that individuals high in these traits may retain intact or even sophisticated ToM, deploying it strategically or manipulatively (Arefi, 2010; Song et al., 2023). In this view, ToM is not exclusively prosocial but may serve instrumental aims.

Among contextual determinants, socioeconomic status (SES) consistently emerges as influential. SES relates to small-to-medium differences in executive functions, which may mediate its effects on ToM. Children from disadvantaged backgrounds often have reduced linguistic and social opportunities, such as less exposure to mental-state talk or complex narratives, partially explaining differences in ToM development (Lawson et al., 2017; Pluck et al., 2021). Financial incentives and social rank also modulate ToM. Ridinger and McBride (2015) found that monetary incentives influenced performance on the Reading the Mind in the Eyes Test in opposite directions for men and women: men improved under competitive conditions, whereas women performed worse, potentially due to diminished intrinsic

motivation. Similarly, Rutherford (2004) showed that temporary social rank affects ToM: participants assigned to subordinate positions outperformed those assigned to higher-power roles, suggesting that lower social power increases the need to monitor others' mental states.

2.5 – Stimulating and strengthening Theory of Mind: Evidence and interventions

Recent research challenges the view that ToM is a fixed ability fully established in childhood. Contemporary studies increasingly conceptualize it as a set of plastic skills that can continue to develop throughout the lifespan (Bas-Sarmiento et al., 2020). Within this framework, a growing body of work has examined contexts, strategies, and interventions capable of supporting the understanding of mental and emotional states in both children and adults.

The artistic and cultural domain has proved particularly conducive to activating and training ToM (Westby & Robinson, 2014). Goldstein et al. (2009) showed that theatrical practice offers an ideal environment for exercising the capacity to infer thoughts, emotions, and intentions: actors must envision characters' mental states, understand their motivations, and translate them into coherent actions. Adolescents and young adults with acting experience perform better on ToM tasks, and longitudinal evidence indicates that a year of theatre practice enhances mental-state interpretation (Goldstein et al., 2012).

Comparable benefits arise from engagement with literary and audiovisual narratives. Kidd and Castano (2013) found that reading literary fiction, compared to popular fiction or non-fiction, temporarily improves ToM, likely due to the complexity and ambiguity of literary characters, which require readers to generate sophisticated mental representations. Castano (2021) extended these findings to art-house cinema, showing that narrative complexity engages meta-representational processing and activates ToM-related neural circuits. Complementarily, Rooney and Bálint (2018) found that close-ups of expressive faces in animated films increase

spontaneous mental-state references, suggesting that salient emotional cues foster spontaneous mentalizing. Linguistic processes also contribute: Bowes and Katz (2015) demonstrated that reading or producing metaphors enhances recognition of emotions and mental states from others' eyes, indicating that interpreting implicit meanings promotes perspective-taking. Overall, aesthetic and linguistic experiences (storytelling, theatre, cinema, figurative language) can transiently trigger ToM mechanisms, revealing their plasticity in everyday contexts.

More robust evidence comes from targeted ToM training programs in preschool and school years (Hofmann et al., 2016). Interventions grounded in explicit reasoning about mental states, metacognitive reflection, and socially engaging contexts produce measurable improvements. Studies by Kloo and Perner (2008) and Arslan et al. (2015) showed that guided explanations of false beliefs and short training with corrective feedback enhance children's perspective-taking and even transfer to executive control. These findings indicate that limitations in mental-state reasoning often reflect limited exposure to suitable cognitive strategies rather than fixed constraints. Motivation further supports these gains: Dorn et al. (2020) found that positive feedback and self-efficacy amplify training effects. Programs integrating cognitive and emotional components are especially effective. Sahin (2012) reported that an eleven-session intervention focusing on reflection about mental states reduced bullying and increased empathy, while Aslan and Köksal Akyol (2019) showed that role-play and emotion-focused storytelling foster perspective-taking in preschoolers. Jacobs and Nader-Grosbois (2020) demonstrated that children with mild to moderate intellectual disabilities also benefit from structured ToM training, confirming its adaptability. Large-scale school programs such as PROMEHS (Poulou et al., 2022) likewise show that systematic discussion of emotions and perspectives yields significant and generalizable improvements in mentalizing.

In Italy, a productive research line has centered on conversational and narrative interventions. Early work by Ornaghi, Grazzani, and colleagues (2014, 2015) showed that

guided discussions of emotionally rich stories enhance both emotional understanding and mental-state reasoning, while promoting prosocial behavior. Later findings by Grazzani et al. (2018) revealed that linguistic competence mediates the link between emotion comprehension and mentalizing, suggesting that language bridges emotional and social cognition. This emphasis on dialogue has inspired complementary approaches: Martín et al. (2013) found that encouraging the use of mental-state verbs and social problem-solving improves belief attribution; Caputi et al. (2021) showed that brief perspective-taking programs reduce loneliness, highlighting broader socio-emotional benefits. Extending this line, Lombardi et al. (2022) developed the *Thoughts in Mind for Children* program, integrating emotional, metacognitive, and mentalizing components. Their results indicate that reflecting on thoughts and emotions through metaphorical stories supports emotion regulation and understanding of internal states, illustrating the holistic potential of narrative-based interventions.

A substantial body of work by Lecce, Bianco, and colleagues further supports the effectiveness of structured conversational and narrative approaches in primary education (see Bianco et al., 2023). Lecce et al. (2014) demonstrated that a program centered on mentalistic stories and explicit mental-state vocabulary produces long-lasting ToM improvements in 9–10-year-olds, independent of verbal ability or socioeconomic background. Gains persisted two months after the intervention, indicating the durability of structured dialogue. Bianco and colleagues (2019, 2021) extended these findings to 7–8-year-olds, showing improvements not only in ToM but also in untrained tasks and reciprocal links with recursive thinking and metacognition. More recently, Lecce, Ronchi, and Devine (2024) showed that classroom variability in ToM predicts individual growth: children in more heterogeneous environments exhibit greater socio-cognitive development, regardless of verbal skills or social isolation. This suggests that diversity in mentalizing capacities within peer groups can naturally support social learning.

Although fewer studies focus on adults, evidence indicates that ToM remains malleable later in life. Ramezani et al. (2020) found that brief mentalization and role-playing exercises improve ToM in couples facing relational difficulties. Meyer and Lieberman (2016) showed that training in social working memory—requiring individuals to manage information about others’ traits and relationships—enhances perspective-taking accuracy. Lecce et al. (2017) reported that among older adults, ToM is linked to friendship quality primarily when social motivation is high, such as in contexts of active involvement with friends and relatives. Together, these findings suggest that ToM is not merely a developmental milestone but a trainable skill that can be systematically strengthened through educational and relational interventions across the lifespan.

2.6 – Why Theory of Mind could be a protective factor against interpersonal objectification

As discussed in Chapter 1, interpersonal objectification represents a cognitive and moral reduction through which another person is regarded not as an autonomous being, but as a mere instrument serving one's own goals. The other's humanity is symbolically denied: the person is deprived of recognition as a subject endowed with inner experiences, intentions, and mental and emotional states, the very qualities that define human existence. From this perspective, ToM can be conceptualized as a powerful protective factor against objectification. As highlighted earlier, ToM constitutes the cognitive foundation of social cognition, enabling individuals to represent others as intentional and sentient agents, thereby restoring their psychological complexity and moral dignity. If objectification entails the negation of another's mind, ToM represents its opposite, a counter-process of *rehumanization*.

Although no studies have directly examined the relationship between ToM and interpersonal objectification, several strands of research support this hypothesis. Findings from

social neuroscience indicate that perceiving others as mere objects disrupts the neural mechanisms involved in recognizing others as human beings. Harris and Fiske (2006) demonstrated that when members of stigmatized groups are perceived as inferior or instrumental, activity within the medial prefrontal cortex, a key region implicated in ToM, markedly decreases. Similarly, Bernard et al. (2018) showed that sexualized bodies are processed in a part-based, object-like manner, akin to the perception of inanimate objects. These neural dynamics indicate that objectification corresponds to a suspension of recognizing the other as human (see Chapter 1 for detailed discussion). Conversely, the activation of ToM-related neural circuits, including the medial prefrontal cortex, temporo-parietal junction, and superior temporal sulcus, reinstates the perception of others as minds, intentions, and subjects (Gan et al., 2024). Fiske (2009) herself argued that dehumanization and objectification can be reversed through tasks requiring consideration of others' preferences and intentions, that is, through the perception of another's mind.

Empirical evidence further supports this view. Cogoni and colleagues (2018) found that women portrayed in objectifying contexts elicited reduced activation in brain regions associated with empathy and mentalizing compared to those in personalized contexts. This reduction was attributable not to individual differences in empathy or sexism, but to decreased perceptions of agency and intelligence, suggesting that objectification operates through spontaneous diminishment of mind attribution. Majdandžić et al. (2016) demonstrated that engaging in mentalizing—reflecting on others' thoughts, beliefs, and emotions—promotes understanding and prosocial behavior even toward dissimilar individuals, who are more vulnerable to objectification. This suggests that ToM functions as a cognitive corrective, fostering prosocial tendencies fundamentally incompatible with objectification. As discussed earlier, ToM underlies several forms of prosocial behavior (e.g., helping, sharing, and comforting; see Imuta et al., 2016; Qiu et al., 2024), all antithetical to objectification. Waytz et al. (2010) elucidated

this link: perceiving others as possessing minds automatically makes them recipients of rights, dignity, and moral concern, implying that ToM operates as a cognitive and moral barrier against instrumentalization.

Thus, ToM represents not merely a psychological competence but an ethical and social act. Thinking about another's mind and emotions restores their full humanity and upholds the dignity of interpersonal relations. If this capacity allows individuals to perceive others as human and engage in prosocial behaviors toward them, it is reasonable to hypothesize that ToM constitutes a genuine protective factor against objectification. Moreover, since ToM is both an innate capacity and a trainable skill, identifying its protective effects could represent a crucial step in preventing the denial of humanity and instrumentalization of social relations—with far-reaching benefits at both individual and societal levels.

2.7 – Scope and overview of the first part of the research project

As outlined in the Introduction, this first research part was designed to test, to our knowledge for the first time, the overarching hypothesis that ToM functions as a protective cognitive mechanism against interpersonal objectification.

To empirically address this unprecedented question and provide systematic evidence for this theoretical proposition, three empirical studies were conducted (Raguso et al., 2025a), each designed to examine a specific aspect of the hypothesized relationship between ToM and interpersonal objectification, progressing from correlational to experimental and applied approaches. Building on the theoretical foundations presented in Chapter 1, regarding the nature and mechanisms of interpersonal objectification, and those discussed in the current chapter on the features and functioning of ToM, the first study examined whether, at a correlational level, ToM negatively relates to interpersonal objectification. Building on these findings, the second study, comprising two sub-studies, tested whether experimentally enhancing ToM through

audiovisual stimuli could attenuate objectifying tendencies toward others, in line with previous evidence demonstrating that exposure to narrative or film-based material can effectively stimulate mentalizing processes. The third and final study, conducted in a primary school context, represented the culmination of this first research part. It implemented a structured ToM-training program aimed at assessing whether a sustained enhancement of ToM abilities could effectively reduce interpersonal objectification in everyday social and relational contexts.

All hypotheses, methods, and experimental materials of the studies conducted in this first part of the research project were pre-registered and are available on the Open Science Framework: <https://osf.io/yvcbm/overview>³

2.8 – Study 1: First correlational evidence on the relationship between ToM and interpersonal objectification

Study 1 was designed to provide 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, it was hypothesized that higher levels of ToM would be associated with a lower tendency to objectify others (*H_{p1}*). Given that, as discussed in the current chapter, ToM comprises both cognitive and affective dimensions, the study also aimed, on an exploratory basis, to examine the distinct relation of these two components on interpersonal objectification. The second hypothesis predicted that both cognitive and affective ToM dimensions would negatively correlate with the

³ 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 this thesis but are detailed and available on the OSF.

measures of interpersonal objectification (*Hp2a*), with the affective dimension expected to show a stronger negative association than the cognitive dimension (*Hp2b*).

In light of the issues raised in this chapter regarding the multiplicity of ToM measurement tools—and, consequently, the difficulty of generalizing results across studies due to the imperfect correspondence between the constructs measured (Yeung & Apperly, 2024), a distinctive feature of the present study lies in the use of three different ToM measures. This methodological choice allowed for a broader and more nuanced assessment of individual differences in ToM abilities. At the same time, given the conceptual complexity of interpersonal objectification and the current lack of a single comprehensive scale capturing all its facets, interpersonal objectification was assessed by considering its different theoretical conceptualizations: namely, the tendency to perceive or treat others in social relations as objects, and the inclination to objectify interpersonal relations themselves.

Method

Participants

For this and subsequent two studies, the 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. From this initial pool, 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 (e.g. “This is an attention check question. Please click on 7 and proceed to the next question”, see Oppenheimer et al., 2009). Ultimately, the final sample comprised 300 participants (174 women, 121 men, and 5 preferred not to answer; $M_{\text{age}} = 29.92$, age range = 18-81; $SD = 14.50$). All participants were Italian. Regarding educational attainment, 8.7% of participants held a middle school diploma, 64.0%

had completed high school, 11.7% possessed a bachelor's degree, 12.7% held a master's degree, and 3.0% reported holding a postgraduate degree (master's or PhD).

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.

ToM measures. As discussed earlier, given the wide variety of instruments currently available in the literature to assess ToM, each capturing different nuances of this multifaceted construct, it was decided to employ multiple measures, including two performance-based tasks and one self-report instrument. The first measure was the Italian version (Vellante et al., 2013) of the *Reading the Mind in the Eyes Test*, one of the most widely used tools for assessing ToM abilities (Baron-Cohen, 2001). Participants were presented with 36 validated photographs depicting only the eye region of various actors and actresses (see Figure 1). For each image, they were asked to choose, from four possible options, the emotion or mental state expressed by the eyes. The final score reported for each participant, calculated by summing the number of correct responses, reflected the participant's accuracy in inferring others' cognitive and emotional states. The second measure was an Italian adapted version of the *ToM Inventory* (Hutchins et al., 2021) designed to assess self-reported levels of ToM. It included 28 items ($\alpha = .90$), measuring both cognitive (e.g., "I understand irony"; "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 affective components ("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 ToM. Finally, the third measure, the *Yoni Task* (see Isernia et al., 2022 for the Italian version), was employed to separately assess cognitive and affective components of ToM. This computerized task consisted of 48 progressively complex stimuli depicting an

animated character (“Yoni”) who directed his gaze toward different targets (e.g., objects or people) while displaying distinct facial expressions (see Figure 2). In each trial, participants selected, from four response options, what they believed Yoni was thinking (cognitive ToM) or feeling (affective ToM). Two separate indices—cognitive and affective accuracy—were computed by summing correct responses, with higher scores indicating greater accuracy in discerning others’ thoughts and emotions.

Interpersonal objectification measures. The 10-item *Relations’ Objectification Scale* (Lachowicz-Tabaczek et al., 2021) was used to assess individuals’ general tendency to perceive interpersonal relationships instrumentally ($\alpha = .80$; 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 indicated their agreement on the 7-point scale (1 = “*strongly disagree*”; 7 = “*strongly agree*”), with higher scores reflecting stronger objectification of interpersonal relations. The *Others’ Objectification Scale* (Andrighetto et al., 2017) was instead employed to assess the tendency to perceive others as objects within interpersonal exchanges. 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 ($\alpha = .87$): 6 objects-related (e.g., thing, tool), and 6 people-related (e.g., human, citizen). Separate scores were then calculated for the two categories of nouns, and subsequently, a single index was calculated, in which the human score was subtracted from the instrument one, so that higher scores indicate a greater tendency to objectify others.

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

Figure 2.1

Example items from the Reading the Mind in the Eyes Test.

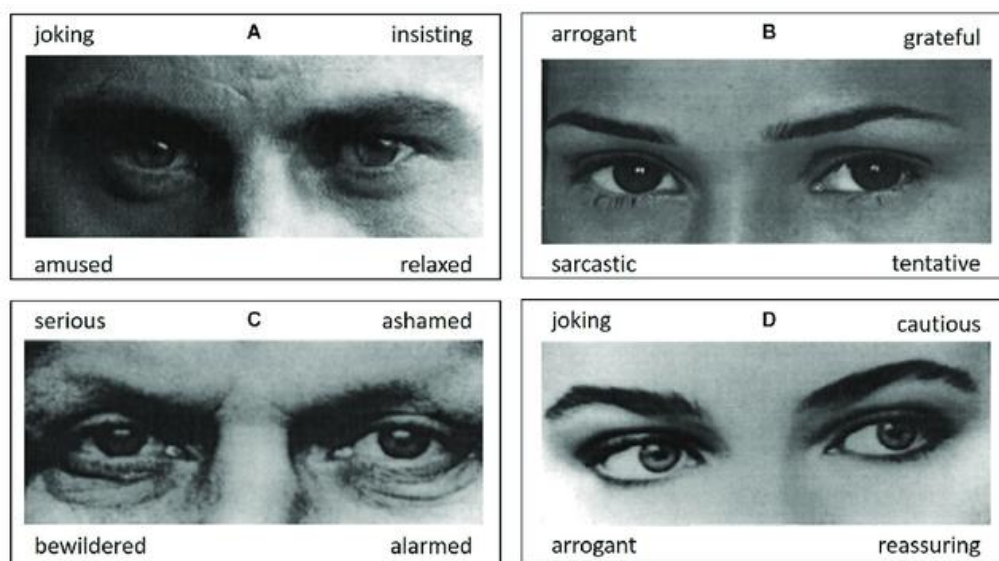


Figure 2.2.

Example items from the Yoni Task.

FIRST ORDER		
<i>Cognitive ToM</i>	<i>Affective ToM</i>	<i>Physical items</i>
Yoni is thinking of ____	Yoni loves ____	Yoni is close to ____
SECOND ORDER		
<i>Cognitive ToM</i>	<i>Affective ToM</i>	<i>Physical items</i>
Yoni is thinking about the fruit that ____ wants	Yoni loves the fruit that ____ does not love	Yoni has the toy that ____ has

Results

Data analyses of the present and the subsequent three studies were conducted using both IBM SPSS Statistics software (version 25) and the open-source software Jamovi (version 2.6.2). In this and the following studies, the main correlation coefficients were interpreted according to Funder and Ozer's (2019) benchmarks, which define small ($r \approx 0.10$), medium ($r \approx 0.20$), and large ($r \approx 0.30$) effects as reference thresholds for evaluating effect sizes.

Table 2.1 reports correlations among variables. Confirming *H_{p1}*, a clear negative association between the ToM measures and both scores of interpersonal objectification emerged: the indexes of the *Reading the Mind in the Eyes Test* and *ToM Inventory*, as well as the cognitive and affective scores for the *Yoni Task*, were all negatively correlated with the participants' tendency to objectify others and interpersonal relations, with effect sizes ($|r| = .17-.24$) falling within the small-to-medium range (Funder & Ozer, 2019).

Table 2.1.

Correlation Matrix for Study 1 variables.

	M	SD	1	2	3	4	5
1 Reading the Mind	23.86	3.71	—				
2 Yoni Task Cognitive	16.03	4.47	.22***	—			
3 Yoni Task Affective	16.25	3.95	.24***	.74***	—		
4 ToM Inventory	4.99	0.62	.15**	.03	.032	—	
5 Relations' Objectification	2.31	0.80	-.20***	-.19**	-.16**	-.24***	—
6 Others' Objectification	2.17	0.85	-.20***	-.20***	-.17**	-.24***	.38***

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

To test *H_{p2a}* 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: $F(4,295) = 8.43, p < .001, R^2 = .103$; Model 2: $F(4,295) = 4.04, p = .003, R^2 = .052$) 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 2.2).

Table 2.2.

The effects of Cognitive ToM and Affective ToM, measured by the Yoni Task, on the two measures of Interpersonal Objectification in Study 1.

Dependent variables	Predictors	Estimate s	95% Confidence			<i>t</i>	<i>p</i>
			Interval				
			SE	Lower	Upper		
Relations’ Objectification							
	Intercept	-0.17	.07	-0.312	-0.032	-2.41	.017
	Yoni Task - Cognitive	-0.17	.08	-0.331	-0.005	-2.02	.044
	Yoni Task - Affective	-0.03	.08	-0.197	0.129	-0.41	.682
	Gender	0.43	.11	0.205	0.647	3.79	< .001
	Age	-0.16	.05	-0.261	-0.043	-2.76	.006
Others’ Objectification							
	Intercept	-0.08	.07	-0.224	0.065	-1.09	.279
	Yoni Task - Cognitive	-0.17	.09	-0.342	-0.006	-2.04	.042
	Yoni Task - Affective	-0.04	.09	-0.204	0.131	-0.43	.666
	Gender	0.20	.12	-0.030	0.424	1.71	.089
	Age	-0.00	.06	-0.112	0.112	-0.01	.994

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

Overall, findings of Study 1 robustly confirmed the 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 *Hp2*, at least when considering the *Yoni Task* indexes.

2.9 – Studies 2a and 2b: Examining the Effects of Experimental Activation of Theory of Mind on Interpersonal Objectification

Study 2a

Study 2a and 2b were designed to replicate and extend the findings of Study 1. Given the correlational nature of Study 1, the present part aimed to establish the causal direction of the investigated relationship by experimentally manipulating ToM and its dimensions, and subsequently observing their effects on interpersonal objectification. In doing so, the design was based on recent empirical literature showing that the ability to understand others' cognitive and emotional states can be either stimulated (Bowes & Katz, 2015; Rooney & Balint, 2018) or inhibited (Mahy et al., 2014). In Study 2a, an experimental paradigm was created in which participants were exposed to an animated film with scenes designed to activate ToM brain networks (see Hortensius et al., 2021). Depending on the experimental condition, participants' focus was directed either on the emotions experienced by the characters (affective ToM) or on their intentions (cognitive ToM). These conditions were compared with a control condition in which participants viewed neutral multimedia content of equivalent duration. Subsequently, the effects of ToM stimulation on interpersonal objectification were assessed. Importantly, in addition to the measures of relation- and other-objectification used in the previous study, a partner selection task was also administered to assess participants' tendency to focus on goal-related characteristics of a given interactant (Teng et al., 2016; Wang & Krumhuber, 2017). The preregistered hypotheses were as follows: both experimental conditions would lead to decreased interpersonal objectification across the considered measures when compared to the control condition (*Hp1*); moreover, these effects were predicted to be stronger in the affective

ToM condition than in the cognitive ToM condition (*Hp2*). Crucially, all effects were examined while controlling for participants' baseline ToM levels, assessed prior to the experimental manipulation.

Method

Participants

A priori power analysis conducted using G*Power software ($f = .25$, power = .80, alpha = .05) indicated a minimum sample size of 196 participants for conducting variance analyses across three independent groups. To ensure a sufficiently heterogeneous sample, participants were recruited using a snowball sampling procedure. 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; $M_{\text{age}} = 28.88$ 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. All participants were Italian. Regarding education level, 8.0% held a middle school diploma, 57.2% a high school diploma, 20.9% a bachelor's degree, 10.9% a master's degree, and 3.0% held a master's or PhD degree.

Procedure and materials

The study was conducted online and divided into two main parts. In the first one, along with sociodemographic variables (age, gender, nationality, and education), 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 ($\alpha = .90$). This preliminary assessment allowed for obtaining an individual ToM baseline value independent of the experimental manipulation.

In the second part, conducted a minimum of 72 hours after the first to minimize potential carryover effects from 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-minute video clip used by Hortensius and colleagues (2021) to activate ToM brain networks, the Disney Pixar animated film “Party Cloudy” (available at: <https://vimeo.com/831591078>). The procedure was adapted for this study. Depending on the condition, participants were instructed to focus on either the characters’ intentions and reasoning processes (cognitive ToM activation) or their emotions and affective experiences (affective ToM activation) before watching the video. To reinforce the manipulation, after viewing, participants answered an open question tailored to their condition: “*Please describe what you think the stork and the cloud were thinking, as well as the reflections and reasoning that guided their actions*” (cognitive ToM activation) or “*Please describe what you think the stork and the cloud were feeling, and how their emotions influenced their actions*” (affective ToM activation). In the control condition, participants viewed a 5-minute documentary about a European capital and answered neutral comprehension questions.

After the experimental manipulation, participants’ levels of interpersonal objectification were assessed using a partner selection task based on a fictional scenario in which they could win a large sum of money on a TV quiz show. Participants were asked to choose between two potential partners: one described with socially and emotionally oriented traits (partner A) and the other with goal- and performance-oriented traits (partner B, for a similar measure, see Teng et al., 2016; Wang & Krumhuber, 2016). Participants selected their partner by adjusting a slider, where 1 indicated a preference for partner A and 7 for partner B. Interpersonal objectification, operationalized as focusing on goal-oriented characteristics, was reflected in the tendency to choose partner B, who was portrayed as more instrumental for winning. Furthermore, we assessed the participants’ tendency to objectify through the Relations’ Objectification scale ($\alpha = .86$) and Others’ Objectification scale ($\alpha = .85$) as in Study 1.

Results

A Multivariate Analysis of Covariance (MANCOVA) was conducted, with the three-level experimental condition (1 = cognitive ToM activation, 2 = affective ToM activation, 3 = control) as predictor and both the choice of the partner and the two measures of interpersonal objectification as dependent variables. Additionally, individual ToM levels assessed before the manipulation were entered as a covariate, together with participants' gender, age and their perceived involvement and pleasantness toward the video. Results indicated no effects of the condition, $\lambda = .99$, $F(6,370) = .31$, $p = .930$, $\eta_p^2 = .005$ and univariate tests similarly revealed no significant effects of the condition on the three dependent variables (see Table 2.3).

Table 2.3.

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

Measures	<i>F</i> (3,185)	<i>p</i>	η_p^2	Condition					
				Cognitive ToM		Affective ToM		Control	
				activation		activation			
				<i>M</i> (<i>SD</i>)					
Partner's choice	0.238	.789	.003	3.94	(2.36)	3.92	(2.19)	4.10	(2.27)
Relations' objectification	0.674	.511	.007	3.30	(1.08)	3.24	(1.02)	3.31	(0.88)
Others' objectification	0.669	.513	.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.

Contrary to our hypotheses, participants in the two ToM conditions exhibited similar levels of interpersonal objectification to those assigned to the control condition. None of the covariates showed significant effects ($F_s \leq 2.05$, $p_s \geq .108$), except for individual ToM levels, $\lambda = .95$, $F(3,185) = 2.89$, $p = .037$, $\eta_p^2 = .045$, which were negatively associated with objectification measures, replicating the pattern observed in Study 1. To examine whether the (null) effect of ToM activation – induced through experimental manipulation – on objectification measures might be influenced by individual differences in stable ToM levels, a

series of moderation analyses was conducted. The cognitive ToM activation condition (Dummy 1) and the affective ToM activation condition (Dummy 2) 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, whereas individual ToM levels exerted a significant negative direct effect on objectification, particularly for the measure of Others' objectification (see Table 2.4).

Results of Study 2a did not confirm the preregistered hypotheses: neither the activation of cognitive ToM nor the activation of affective ToM were effective in reducing any index of interpersonal objectification. Instead, as in Study 1, individual levels of ToM, assessed well before the subsequent ToM activation, significantly predicted lower levels of others' objectification. Although this effect emerged for only one measure of interpersonal objectification, it provides preliminary evidence for the predominance of stable, dispositional ToM abilities over situational activation in reducing objectification. However, since this difference may also result from the limited effectiveness of the manipulation in eliciting and sustaining ToM processes during subsequent tasks, Study 2b aimed to replicate this study using a longer and more engaging experimental manipulation based on different multimedia materials.

Table 2.4.

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

Dependent variables	Predictor	Estimates	SE	95% Confidence Interval		<i>t</i>	<i>p</i>
				Lower	Upper		
Partner's choice	Intercept	-0.00	.072	-0.142	0.142	-0.002	.998
	Cognitive ToM activation	-0.05	.086	-0.219	0.120	-0.58	.565
	Affective ToM activation	-0.05	.086	-0.221	0.120	-0.59	.559
	Individual ToM levels	0.02	.074	-0.129	0.162	0.22	.824
	Cognitive ToM activation × Individual ToM levels	0.01	.089	-0.166	0.183	0.01	.922
	Affective ToM activation × Individual ToM levels	0.03	.087	-0.143	0.199	0.32	.746
	Age	-0.11	.076	-0.258	0.040	-1.44	.152
	Gender	0.04	.073	-0.107	0.181	0.50	.615
Relations' objectification	Intercept	-0.001	.072	-0.143	0.141	-0.01	.991
	Cognitive ToM activation	-0.002	.086	-0.172	0.168	-0.02	.981
	Affective ToM activation	-0.02	.087	-0.194	0.148	-0.27	.791
	Individual ToM levels	-0.08	.074	-0.226	0.066	-1.08	.280
	Cognitive ToM activation × Individual ToM levels	0.07	.089	-0.103	0.246	0.81	.421
	Affective ToM activation × Individual ToM levels	-0.01	.087	-0.181	0.162	-0.11	.911
	Age	0.001	.076	-0.148	0.151	0.02	.988
	Gender	-0.02	.073	-0.167	0.122	-0.31	.758
Others' objectification	Intercept	0.000	.070	-0.139	0.139	0.000	.000
	Cognitive ToM activation	0.06	.084	-0.106	0.226	0.71	.477
	Affective ToM activation	0.01	.085	-0.161	0.173	0.08	.940
	Individual ToM levels	-0.20	.072	-0.344	-0.059	-2.80	.006
	Cognitive ToM activation × Individual ToM levels	0.02	.087	-0.155	0.187	0.19	.854
	Affective ToM activation × Individual ToM levels	-0.08	.085	-0.250	0.085	-0.97	.335
	Age	-0.06	.074	-0.201	0.091	-0.74	.461
	Gender	-0.05	.072	-0.189	0.093	-0.67	.505

Study 2b

The video clip used to stimulate ToM in Study 2a was of short duration (5 minutes) and featured non-human and imaginary characters, possibly weakening the efficacy of ToM activation. To overcome these limitations, in Study 2b a similar procedure was employed, but in the experimental part participants were exposed to a 20-minute excerpt from a dramatic live-action film with real human characters.

Method

Participants

The same minimum sample size of Study 2a was considered. As in Study 2a, to ensure a sufficiently heterogeneous sample, participants were recruited using a snowball sampling procedure. 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). All participants were Italian. Regarding education level, 8.3% of participants held a middle school diploma, 69.0% a high school diploma, 11.8% a bachelor's degree, 9.2% a master's degree, and 1.7% held a master's or PhD degree.

Procedure and materials

The procedure was identical to Study 2a: participants first completed the ToM Inventory ($\alpha = .91$), and, after a 72-hour 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 ($\alpha = .80$) and others ($\alpha = .90$). 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, $\alpha = .86$; Partner's objectification scale $\alpha = .89$).

Results

As in the previous study, the hypotheses were tested using MANCOVA. Results were similar to those of Study 2a, showing no effect of the condition, $\lambda = .97$, $F(10,436) = .65$, $p = .768$, $\eta_p^2 = .015$, and univariate tests revealed no significant effects of the condition on the three dependent variables (see Table 2.5). 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 ($F_s \leq 2.13$, $p_s \geq .063$), except for age, $\lambda = .93$, $F(5,217) = 2.84$, $p = .017$, $\eta_p^2 = .061$, and gender, $\lambda = .92$, $F(5,217) = 3.58$, $p = .004$.

Table 2.5.

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

Measure	$F(10,436)$	p	η_p^2	Condition					
				Cognitive ToM		Affective ToM		Control	
				activation		activation			
				$M (SD)$					
Partner's choice	1.18	.310	.011	3.70	(2.30)	3.56	(2.53)	4.19	(2.44)
Relations' objectification (general)	0.81	.447	.007	2.15	(0.70)	2.23	(0.82)	2.29	(0.73)
Others' objectification	0.19	.830	.002	-3.54	(1.97)	-3.78	(1.97)	-3.77	(1.84)
Relation's objectification (partner)	0.21	.813	.002	3.38	(0.97)	3.51	(1.25)	3.56	(0.96)
Partner's objectification scale	0.05	.956	.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.

The same moderation analyses as in Study 2a were conducted, with the addition of the objectification measures related to the selected partner in the imagined scenario among the dependent variables. The findings were consistent with those of Study 2a, revealing no significant effect of the conditions on either partner's choice or interpersonal objectification measures (see Table 2.6). However, individual ToM levels were again negatively and significantly associated 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 depicting human characters and requiring inference of their thoughts and emotions, situational activation of cognitive and affective ToM did not significantly affect participants' 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 a clear pattern of findings: 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-based tasks) employed in previous work.

Table 2.6.

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

Dependent variable	Predictor	Estimates	SE	95% Confidence Interval		<i>t</i>	<i>p</i>
				Lower	Upper		
Partner's choice	Intercept	-0.007	.066	-0.136	0.123	-0.104	.917
	Cognitive ToM activation	-0.086	.073	-0.229	0.058	-1.172	.242
	Affective ToM activation	-0.118	.073	-0.262	0.026	-1.613	.108
	Individual ToM levels	-0.110	.067	-0.242	0.023	-1.635	.104
	Cognitive ToM activation * Individual ToM levels	0.030	.074	-0.115	0.175	0.409	.683
	Affective ToM activation * Individual ToM levels	0.111	.073	-0.033	0.254	1.522	.130
	Age	-0.021	.067	-0.152	0.110	-0.318	.751
	Gender	-0.111	.066	-0.241	0.018	-1.692	.092
Relations' objectification (General)	Intercept	0.005	.063	-0.120	0.130	0.076	.939
	Cognitive ToM activation	-0.089	.071	-0.228	0.050	-1.262	.208
	Affective ToM activation	-0.039	.071	-0.179	0.100	-0.556	.579
	ToM	-0.209	.065	-0.337	-0.081	-3.215	.002
	Cognitive ToM activation * Individual ToM levels	-0.055	.071	-0.195	0.085	-0.778	.437
	Affective ToM activation * Individual ToM levels	-0.059	.070	-0.198	0.080	-0.834	.405
	Age	-0.073	.064	-0.200	0.054	-1.129	.260
	Gender	-0.236	.064	-0.361	-0.110	-3.702	<.001
Others' objectification	Intercept	-0.001	.066	-0.131	0.128	-0.022	.982
	Cognitive ToM activation	0.053	.073	-0.091	0.196	0.720	.472
	Affective ToM activation	-0.006	.073	-0.150	0.138	-0.080	.936
	Individual ToM levels	-0.041	.067	-0.173	0.092	-0.605	.546
	Cognitive ToM activation * Individual ToM levels	0.014	.074	-0.131	0.159	0.192	.848
	Affective ToM activation * Individual ToM levels	0.019	.073	-0.124	0.163	0.264	.792
	Age	0.199	.067	0.068	0.330	2.987	.003
	Gender	-0.054	.066	-0.184	0.075	-0.826	.410
Relations' objectification (Partner)	Intercept	-0.002	.066	-0.132	0.127	-0.037	.970
	Cognitive ToM activation	-0.072	.073	-0.216	0.072	-0.987	.325
	Affective ToM activation	-0.015	.073	-0.159	0.130	-0.200	.841
	Individual ToM levels	-0.138	.067	-0.270	-0.006	-2.053	.041
	Cognitive ToM activation * Individual ToM levels	0.038	.074	-0.107	0.184	0.522	.602
	Affective ToM activation * Individual ToM levels	0.023	.073	-0.120	0.167	0.321	.749
	Age	0.017	.067	-0.115	0.148	0.249	.804
	Gender	-0.140	.066	-0.270	-0.010	-2.121	.035
Partner's objectification	Intercept	-0.007	.065	-0.136	0.122	-0.113	.910
	Cognitive ToM activation	0.006	.073	-0.137	0.149	0.081	.935
	Affective ToM activation	-0.020	.073	-0.164	0.124	-0.275	.783
	Individual ToM levels	-0.029	.067	-0.161	0.103	-0.439	.661
	Cognitive ToM activation * Individual ToM levels	0.060	.073	-0.084	0.204	0.818	.414
	Affective ToM activation * Individual ToM levels	0.104	.073	-0.039	0.247	1.428	.155
	Age	0.106	.066	-0.024	0.237	1.605	.110
	Gender	-0.180	.066	-0.310	-0.051	-2.747	.007

2.10 – Study 3: Testing a school-based ToM training to reduce interpersonal objectification

Although the experimental manipulation of ToM activation did not influence interpersonal objectification, stable individual differences in ToM had a clear effect. Therefore, in Study 3, a field intervention was implemented to test whether structured ToM training in school-aged children could reduce interpersonal objectification. The focus was placed on children for three key reasons: first, as discussed in this chapter, although ToM can also be trained in adulthood, this ability undergoes its most significant development during childhood, a period when it is likely more malleable (Wellman, 2014); second, objectifying behaviors also occur in childhood (Gasiorowska et al., 2016; Leshin & Rhodes, 2025); and third, as previously illustrated, most validated ToM training programs are designed for this age group, as it is widely believed that strengthening this skill is particularly important—and more effective—during childhood. An adapted version of the four-weekly program developed by Lecce and colleagues (2014) was used, which includes storytelling enriched with inner-state vocabulary, individual reflection, and group discussion. As explained in the preceding sections, this validated program belongs to a major line of conversational approaches that has repeatedly shown to enhance ToM abilities regardless of cognitive ability, gender, or socio-economic status (for a review see Bianco & Castelli, 2023). In this study, the potential of this program to reduce interpersonal objectification by improving ToM skills was examined.

Given the well-established effectiveness of this training in promoting ToM development, the study design was modified to specifically focus on the distinct roles of its cognitive and affective dimensions. Rather than using the original ToM and control conditions, two key conditions—cognitive ToM and affective ToM—were compared. To assess their distinct effects, participants were divided into two groups. Group 1 received the original ToM training, focusing on cognitive ToM, while Group 2's training was modified to emphasize

affective ToM using specific scenarios (Feshbach & Roe, 1968). To thoroughly evaluate the intervention's effectiveness, both ToM and interpersonal objectification were measured before and after the intervention, ensuring a comprehensive assessment of its impact. Additionally, the short duration of the training (4 weeks) and the regular continuation of normal lessons, aside from the training itself, created an ecologically valid and controlled setting that minimized potential confounding factors, 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, *Hp1a*), while the group assigned to the affective ToM training (Group 2) would report at the end higher levels of affective ToM (*Hp1b*). We also expected that both groups would report lower levels of interpersonal objectification at the end of their respective training (*Hp2a*), but that these effects would be stronger among those assigned to the affective ToM training (*Hp2b*).

Method

Participants

The intervention was implemented 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 formed the final sample. Although logistical constraints prevented the conduction of a priori power analyses, the sample size was in line with previous studies using this training, which reported effective sample sizes 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).

Procedure and materials

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 overall procedure was identical across conditions, differing only in the narrative stimuli employed. The cognitive ToM group received stimuli from Lecce and colleagues (2014), while the affective ToM group was presented with adapted stories based on Feshbach & Roe (1968), specifically designed to elicit affective ToM processes. Each session comprises two parts, featuring two stories followed by comprehension and vocabulary exercises (see Table 2.7). 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 collective summary emphasizing the story's core theme.

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 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). Total scores ranged from 0 to 12, with higher scores reflecting greater cognitive ToM ability. 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 ($\alpha_{T0} = .73$, $\alpha_{T1} = .79$; e.g., “I can imagine how my parents feel, even if I they don ’t show it”, “I understand how my friends feel by the way they behave”), rated on a five-point agreement Likert scale (1 = “*never*”; 5 = “*always*”) with higher scores indicating higher affective ToM.

Table 2.7.

Sample material from the protocol used

Cognitive ToM condition sample material (Lecce et al., 2014)
Story 1: Sam and the Window Sam is playing soccer with his friends during recess when he notices the ball is about to hit a younger girl. Sam definitely doesn’t want that to happen! So, he tries to kick the ball away with a strong kick to send it somewhere else. However, in doing so, he accidentally kicks the ball into his classroom window, shattering the glass into pieces. Just at that moment, the teacher arrives, having only seen part of what happened, and she thinks about punishing Sam by making him miss the rest of recess. • Did Sam break the window on purpose? • Why does the teacher want to punish Sam? • According to Sam, why does the teacher want to punish him? • Could Sam say something to avoid being punished? What? Why might the teacher decide, in the end, not to punish him if he says that?
Affective ToM condition sample material (Feshbach & Roe, 1968)
Story 1: The Contest Michele decided to enter a contest he heard about on TV, where the prize is two tickets to Disneyland, including food. He sends in his application, hoping to win. A few days later, he receives an envelope in the mail: as soon as he opens it, he cheers! Inside is a letter informing him that he won, along with the two tickets to Disneyland. He can’t wait to tell his friends and family. • How does Michele feel? • How will his friends and family feel when Michele tells them the news? • How did Michele feel before receiving the letter? • How do you feel reading this story?

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, 2021) that was ad hoc

adapted for the target group ($\alpha_{T0} = .72$, $\alpha_{T1} = .74$; e.g., “I only talk to others when I need something from them”, “Others are important to me only when they help me get something I want”; 1 = “*never*”; 5 = “*always*”). Additionally, we assessed children’s behavioral tendencies to treat others instrumentally using four custom-designed social dilemma scenarios—two during the T0 assessment and two during the T1 assessment—to minimize familiarity with the scenarios. In them, children faced dilemmas where they needed to evaluate and rate their agreement with two possible actions: one that could be considered objectifying and another that was non-objectifying. The scenarios involved decisions about whether to help someone in need or to act solely for personal gain (see Table 2.8). Children rated each statement on a five-point Likert scale (1 = “*definitely yes*”; 5 = “*definitely not*”; $\alpha_{T0} = .51$, $\alpha_{T1} = .74$), with higher scores reflecting a stronger tendency to objectify others.

At the conclusion of the intervention, findings were presented in dedicated meetings with the children, their parents, and teachers.

Results

Table 2.9 presents the correlations between affective and cognitive ToM measurements and both objectification measures at T0 and T1. The values confirmed the pattern observed in Studies 1, 2a, and 2b, namely the existence of a negative relationship between affective and cognitive ToM and interpersonal objectification. This relationship was present at both T0 and T1 for at least one of the objectification measures, with effect sizes ($|r| = .09-.39$) falling within the small-to-large range (see Table 2.9).

Table 2.8.

Examples of the custom-designed social dilemma scenarios

Story 1: Your First Day of School

It's your first day of middle school, and you're really excited. You don't know anyone yet and are trying to figure out where to sit in your new class, but there's a lot of noise and confusion. You glance around to see where others are sitting, trying to decide who you'd like to sit next to. Just then, the teacher walks in, and most of your classmates quickly take their seats, leaving only two empty spots. One is next to Luca/Lucia, someone you vaguely remember from a friend's birthday party. They don't seem to know anyone either and look just as excited as you. The other seat is next to Alessio/Alessia, a popular student you've seen around a few times. They can be a bit bossy, but sitting next to them could definitely help you make friends fast and get invited to hang out with other classmates.

Who would you prefer to sit next to? (Rate from 1 = not at all to 5 = very much)

Luca/Lucia:

1 – Not at all

2 – A little

3 – Somewhat

4 – A lot

5 – Very much

Alessio/Alessia:

1 – Not at all

2 – A little

3 – Somewhat

4 – A lot

5 – Very much

Story 2: The Tryouts

Federico/Federica loves soccer/ballet and is really determined to join the best team/group in the city. He/She has been preparing for weeks for the tryouts and knows he/she can't miss this opportunity because there are only a few spots available. The day before the tryouts, his/her parents' car breaks down, and none of his/her relatives can take him/her to the tryouts the next day. It seems like all is lost, but then Federico/Federica remembers he/she has Angelo's/Angela's phone number, another kid who will be attending the tryouts. He/She sends a message asking for a ride, and Angelo/Angela replies immediately saying it's fine. In the same message, Angelo/Angela tells Federico/Federica that he/she is really worried because he/she lost his/her soccer cleats/dance shoes and will have to do the tryouts in regular shoes, which could make it hard to pass. Federico/Federica has an extra pair of cleats/dance shoes.

What do you think Federico/Federica should do? (From 1 = Definitely not to 5 = Definitely yes)

Take the ride from Angelo/Angela without offering the extra cleats/shoes, so he/she has an advantage during the tryouts.

1 - Definitely not

2 - More no than yes

3 - Somewhat yes, somewhat no

4 - More yes than no

5 - Definitely yes

Take the ride from Angelo/Angela and offer the extra cleats/shoes to help him/her do well in the tryouts.

1 - Definitely not

2 - More no than yes

3 - Somewhat yes, somewhat no

4 - More yes than no

5 - Definitely yes

Table 2.9.***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	.73***	—					
3	Affective ToM - T0	8.50	2.06	.27*	.31***	—				
4	Affective ToM - T1	11.21	1.55	.24*	.30**	.31**	—			
5	Relations' Objectification - T0	1.84	0.58	-.27*	-.39***	-.27*	-.16	—		
6	Relations' Objectification - T1	1.64	0.50	-.09*	-.37***	-.22	-.27*	.64***	—	
7	Objectification scenarios - T0	2.16	0.78	-.29**	-.21	-.30**	-.24*	.38***	0.27*	—
8	Objectification scenarios - T1	1.47	0.62	-.012	-.17	-.13	-.18	-.18	.50***	.25*

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

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 a 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 *Hp1a*, *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 *Hp2b* (see Table 2.10).

The results of Study 3 confirm the 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 protective individual factor against interpersonal objectification. Instead, contrary to expectations (*Hp2b*), the cognitive and affective ToM intervention conditions did not display significantly different reductions in interpersonal objectification among the participating

children, suggesting that both the cognitive and affective components of ToM play an equally important role in recognizing others as human beings and in protecting against objectifying tendencies.

Table 2.10.

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)	.294	42.716	.000	.706
Condition (cognitive vs. affective)	.954	0.865	.490	.046
Time $\times$ Condition	.910	1.760	.146	.090

Pairwise comparisons per condition and time

Measure	Condition	T0	T1	Mean differences	Standard error	Sign.	95% confidence interval for the difference	
		$M (SD)$	$M (SD)$				Lower	Upper
Cognitive ToM	Cognitive	3.55 (0.51)	3.70 (0.53)	-.151	.069	.031	-0.288	-0.014
	Affective	3.31 (0.68)	3.51 (0.65)	-.202	.074	.008	-0.351	-0.054
Affective ToM	Cognitive	8.85 (2.06)	11.29 (1.81)	-2.439	.336	.000	-3.108	-1.770
	Affective	8.08 (1.91)	11.14 (1.26)	-3.057	.363	.000	-3.781	-2.333
Relation objectification	Cognitive	1.82 (0.58)	1.59 (0.46)	.229	.075	.003	0.079	0.379
	Affective	1.91 (0.62)	1.66 (0.55)	.243	.081	.004	0.081	0.406
Objectification scenarios	Cognitive	2.06 (0.74)	1.54 (0.72)	.524	.132	.000	0.261	0.788
	Affective	2.32 (0.81)	1.36 (0.46)	.957	.143	.000	0.672	1.242

Notes: Based on estimated marginal means.

2.11 – Discussion of the results from Studies 1, 2a, 2b and 3

As discussed in Chapter 1, the tendency to view others instrumentally and to disregard their humanity is a pervasive phenomenon that shapes both perception and interaction in social exchanges. Despite its widespread occurrence, psychological strategies aimed at counteracting interpersonal objectification remain largely unexplored. The first part of the present research project provided empirical evidence that ToM can serve as a protective factor against this tendency.

In line with expectations, Study 1 offered correlational evidence indicating that individuals with higher levels of ToM are less prone 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. Importantly, this negative association emerged consistently across multiple ToM measures, confirming that—even though the literature acknowledges substantial variability among ToM assessment tools—the inverse relationship with interpersonal objectification remains robust and theoretically meaningful.

The subsequent step aimed to experimentally test whether activating ToM could reduce the tendency to objectify others (Studies 2a and 2b). Although the results did not meet expectations, this part yielded valuable insights into the conditions under which ToM may effectively operate as a protective mechanism against interpersonal objectification. Attempts to experimentally activate ToM through audio-visual stimuli 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 pattern suggests that brief and passive activations of ToM may be insufficient to produce measurable changes in social cognition and moral perception. 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, 2008; Vohs et al., 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 (Kidd & Castano, 2013), suggesting that a mere brief exposure to priming stimuli may not be enough to significantly activate ToM. Therefore, the lack of significant effects in reducing objectification could stem from inadequate ToM activation. Indeed, it is also possible that baseline differences in participants' ToM abilities played a larger role than anticipated, overshadowing the effects of the experimental induction. Taken together, Studies 2a and 2b suggest that ToM—a complex and multifaceted cognitive skill—may exert a meaningful influence only when it is well developed, stable, and deeply internalized, or when it has been cultivated through sustained learning experiences from early childhood.

Consistent with this reasoning, Study 3 provided the most compelling evidence within this research part, both theoretically and practically. In fact, a structured ToM training intervention with school-aged children led to a notable reduction in objectification tendencies, offering clear evidence that ToM can be enhanced, but only through systematic interventions. Crucially, this study established a causal link between the improvement of ToM skills and the reduction of objectifying attitudes and behavioral intentions, thus supporting the theoretical assumption that mentalizing capacities can serve as a rehumanizing mechanism.

Overall, these findings are highly encouraging, as they demonstrate that a deeply human capacity—universally present yet malleable—can protect individuals, both psychologically and relationally, from the tendency to objectify others. Indeed, as discussed in Chapter 1, this tendency has severe consequences at both the individual and societal level, making the identification of protective factors especially relevant.

Nonetheless, in social psychology, it is essential to examine the impact of psychological variables across multiple levels, integrating both individual and societal dimensions. For this reason, after exploring the relationship between ToM and interpersonal objectification from a psychological and relational perspective, the second part of this project extended the analysis to the broader social domain. Specifically, as will be discussed in Chapter 3, one contextual factor that is deeply intertwined with the structure of modern societies and their patterns of inequality is scarcity. This condition, as will be shown, is not only widespread but also exerts profound effects on physical, psychological, and social functioning, including the quality of interpersonal relationships. In this light, the second part of the present research project pursued two complementary objectives. First, it aimed to establish whether scarcity itself constitutes a contextual antecedent of interpersonal objectification. Second, it sought to examine the complex interplay between scarcity and ToM, investigating two competing theoretical possibilities: whether ToM continues to exert its protective function even under conditions of scarcity, or whether scarcity undermines ToM capacity itself, thereby removing a critical defense mechanism against instrumental social perception. This inquiry marks a crucial step toward understanding how individual cognitive capacities interact with broader socio-economic contexts in shaping dehumanization and rehumanization processes.

CHAPTER 3

THE IMPACT OF SCARCITY

ON INTERPERSONAL OBJECTIFICATION AND THEORY OF MIND

3.1 – Inequality and poverty: The structural roots of the psychological experience of scarcity

For decades, research has documented the steady rise of economic and social inequality. Wealth has become increasingly concentrated among a narrow elite while most of the population struggles to maintain decent living standards (Wilkinson & Pickett, 2017). The 2024 Oxfam report reveals that billionaire wealth grew by approximately 2 trillion dollars—three times faster than the previous year—bringing the richest 1% to hold around 34 trillion dollars, an amount sufficient to eradicate global poverty more than twenty times over. Meanwhile, broad segments of the population face stagnant or declining wages, rising costs, eroding purchasing power, and pervasive job insecurity (Taneja et al., 2025).

The disparity becomes evident when compared with average income levels. Eurostat (2024) reports that full-time workers in the European Union earn approximately €37,900 annually, while the ILO Global Wage Report (2022) shows that real wage growth has nearly stalled worldwide, averaging below 1% over the past three years. In many countries, real wages have actually declined when adjusted for inflation, widening the gap between the general workforce and those benefiting from rising corporate profits. In this context, where a tiny fraction controls an expanding share of resources, most people's capacity to meet daily needs, plan ahead, save, or weather unforeseen events becomes severely constrained.

Extensive evidence demonstrates that poverty generates not merely economic hardship but substantial physical, psychological, and social consequences. Physically, it correlates with poorer health outcomes and reduced life expectancy. Individuals with fewer economic resources

show higher rates of chronic conditions including diabetes, hypertension, cardiovascular disease, and respiratory disorders (Adler & Rehkopf, 2008; Marmot, 2005). Precarious living conditions, exposure to environmental stressors, limited healthcare access, and lower-quality nutrition contribute to a health gradient where each step down the socioeconomic ladder corresponds to worse outcomes (Wilkinson & Marmot, 2003). These patterns reflect physiological deterioration associated with chronic stress, which impairs immune, endocrine, and cardiovascular functioning (McEwen & Gianaros, 2010).

Psychologically, economic hardship intensifies stress, anxiety, and depressive symptoms (Butterworth et al., 2012; Murali & Oyebode, 2004). Persistent financial adversity generates toxic stress that disrupts emotional regulation and heightens vulnerability to psychopathology (Shonkoff et al., 2012). Recent work highlights broader effects of poverty on mental health, cognitive functioning, and self-related beliefs through interconnected mechanisms (Park et al., 2024). Economic disadvantage diminishes perceived control, self-efficacy, and aspirations, fostering helplessness and demotivation (Haushofer & Salicath, 2024). Research by Kraus and colleagues demonstrates that low socioeconomic status shapes self-perception: individuals with fewer resources typically experience less control over their lives (Kraus et al., 2009), reduced agency, and heightened risks of alienation and chronic stress (Kraus et al., 2013; Piff et al., 2020). Developmental neuroscience indicates that growing up in poverty affects the maturation of executive functions and brain regions involved in cognitive control, with lasting implications for educational attainment and social mobility (Farah, 2017; Dean et al., 2018). Ultimately, poverty constrains material opportunities while simultaneously shaping thought, emotion, and self-perception, perpetuating disadvantage across generations (Haushofer & Salicath, 2024; Park et al., 2024).

Socially, poverty undermines community belonging and relational quality. People living in deprivation display lower interpersonal trust, reduced social capital, and weaker civic

participation (Lott & Bullock, 2007; Yoshikawa et al., 2012). Economic insecurity fosters feelings of exclusion and powerlessness, weakening both personal and collective efficacy (Bradshaw et al., 2011). These dynamics intensify vulnerability and sustain intergenerational cycles of disadvantage that erode social mobility and community cohesion (Haushofer & Salicath, 2024; Park et al., 2024).

Parallel research on inequality reveals consequences extending beyond the distribution of material resources. Reviews by Wilkinson and Pickett (2009, 2017) demonstrate that high inequality is associated with increased mental health problems, lower life expectancy, higher violence, and declining social trust. Inequality thus harms not only the poor but overall societal well-being, fostering insecurity, competition, and pervasive stress. Recent studies report that unequal conditions amplify envy, status anxiety, and alienation (Buttrick & Oishi, 2017; Ngamaba et al., 2018). Experimental evidence shows that inequality affects social perception from early childhood: even preschoolers display reduced generosity after exposure to unequal contexts (Kirkland, Jetten, & Nielsen, 2020), suggesting that its effects on cooperation and moral reasoning emerge before children fully grasp social hierarchies.

Inequality also influences how individuals assess their social position. Even objectively middle-income groups perceive themselves as poorer in highly unequal societies due to intensified upward comparisons (Sánchez-Rodríguez et al., 2019). This distorted reference frame reduces subjective well-being and increases feelings of relative deprivation. Moreover, inequality shapes collective representations of society: people in highly unequal contexts infer that dominant norms are competitive and individualistic rather than cooperative (Sánchez-Rodríguez et al., 2018). These perceptions normalize self-interested behavior and reduce motivation for collective action.

Finally, recent evidence shows that perceived economic inequality widens symbolic distance between socioeconomic groups. Individuals tend to attribute greater humanity to the

wealthy and less to the poor, reinforcing stereotypes of inferiority and legitimizing existing hierarchies (Sainz et al., 2022). This dehumanization contributes to moral disengagement and reduces support for redistributive policies. As Payne (2017) argues, economic inequality fosters a psychological architecture of hierarchy in which patterns of dominance and submission become internalized, shaping identity, social trust, and civic engagement.

Experiencing scarcity in unequal societies

Although poverty and inequality have received extensive theoretical and empirical attention among social psychologists in the last decade, a concept that is closely related yet conceptually distinct has only recently begun to attract scholarly focus: the experience of scarcity. Scarcity can be understood as a psychological condition in which an individual's attention is captured by the perception of having limited resources relative to one's needs, goals, or desired standards. It entails a persistent sense of insufficiency and pressure to manage available resources carefully, generating urgency, a focus on the immediate, and a general reduction in cognitive capacity (Mullainathan & Shafir, 2013). Scarcity is deeply rooted in inequality. In fact, as described above, inequality operates as the macro-social mechanism that shapes the asymmetric distribution of resources in society, with some individuals having access to vast amounts of resources, and others that must struggle to meet their basic needs. This asymmetry creates the conditions within which experiences of scarcity emerge and intensify, thus making this condition especially salient in today's unequal societies.

Yet, the relationship between inequality and scarcity extends beyond mere resource availability. While scarcity is often associated with poverty, the two concepts do not fully coincide. Indeed, poverty describes an objective and enduring condition of material deprivation, defined in terms of income, resources, or access to essential goods and services. It can be measured through economic and social indicators and represents a structural reality external to the individual. Scarcity, by contrast, refers to a subjective and situational experience: it can arise

even in the absence of material poverty, when one perceives that one's resources are insufficient to meet environmental demands or personal expectations (Mullainathan & Shafir, 2013; Shah et al., 2012). In other words, while poverty concerns *what one has*, scarcity concerns *how one feels about what one has*. Indeed, scarcity, although much more frequent in contexts of poverty, can also be experienced by people in higher income brackets. It is a psychological lens that translates economic or social conditions into experiences of pressure, limitation, and urgency, shaping cognitive, decisional, and relational processes. In this sense, scarcity can be viewed as a bridge between the structural conditions of inequality and the psychological and behavioral responses of individuals living within them.

This concept also differs from relative deprivation, with which it shares an emphasis on subjective experience but diverges in cognitive and motivational foundations. Relative deprivation, as theorized by Crosby (1976) and later formalized by Smith, Pettigrew, and colleagues (2012), is based on social comparison processes: individuals perceive injustice or disadvantage relative to a reference group, developing feelings of frustration, anger, or resentment. It is therefore a comparative and interpersonal representation of lack, rooted in evaluations of one's social standing within a hierarchy (Walker & Smith, 2002). Scarcity, by contrast, does not necessarily require an external comparison. It is an intrapersonal and immediate experience of lack, centered on the perception of having insufficient resources to meet present challenges or perceived needs (Mullainathan & Shafir, 2013). Whereas relative deprivation involves a cognitive and social judgment ("others have more than I do"), scarcity entails a perceptual and situational appraisal ("I don't have enough right now"). Consequently, the former is closely linked to processes of justice and social identity, while the latter reflects a form of cognitive pressure that alters the management of mental resources, affecting attention, working memory, and self-control (Mani et al., 2013; Shah et al., 2012).

Inequality and poverty thus represent the structural roots within which scarcity takes shape, yet scarcity cannot be reduced to a mere reflection of material conditions. It constitutes an autonomous psychological dimension through which people experience and respond to the lack of resources. Scarcity is not merely a consequence of having little, it is a cognitive and motivational mechanism that transforms economic and social conditions into subjective psychological experiences. Understanding scarcity as a cognitive experience allows us to shift the focus from purely material conditions to the mental and behavioral dynamics they generate, a crucial step toward fully grasping the psychological and social impact of having too little.

3.2 – Theoretical and empirical foundations of scarcity research

The concept of scarcity has deep theoretical roots. Since the 1930s, scholars across disciplines have examined how limited resources shape human perception, motivation, and behavior. In classical psychology, Lewin (1936) proposed that unsatisfied needs generate psychological tensions that focus attention on objects or actions capable of satisfying those needs, thereby influencing goal-directed behavior. Similarly, Maslow's (1943) hierarchy of needs suggested that deprivation of primary resources (food, safety, stability) constrains individuals' ability to pursue higher-order goals of growth and self-actualization. One of the earliest empirical demonstrations came from the Minnesota Starvation Study (Keys et al., 1950), which showed that prolonged food deprivation induces cognitive tunneling: participants became obsessively preoccupied with food-related thoughts, experienced declines in memory and reasoning, and showed marked emotional disturbances. In decision-making domains, Kahneman and Tversky (1979; 2013) demonstrated that scarcity heightens loss aversion and fosters myopic, short-term thinking. Under limited resources, individuals evaluate choices in terms of relative gains and losses rather than absolute value, prioritizing immediate outcomes over future payoffs. Within consumer psychology, Worchel, Lee, and Adewole (1975) revealed

that goods perceived as rare or available in limited quantities are judged more desirable. Along similar lines, Cialdini (1984) identified scarcity as one of six universal principles of persuasion: what is rare or hard to obtain is automatically perceived as more valuable and urgent. Concurrently, developments in cognitive psychology and psychophysiology shifted attention from external to internal resources, emphasizing the mind's limited information-processing capacity. Kahneman (1973) formalized the limited-capacity model of attention, showing that cognitive effort and distraction deplete available processing resources. Likewise, Sweller's (1988) cognitive load theory demonstrated that working memory is intrinsically constrained and that excessive informational demands impair concentration and complex reasoning.

Building upon these foundations, Mullainathan and Shafir (2013), in *Scarcity: Why Having Too Little Means So Much*, reconceptualized scarcity as a unifying psychological construct bridging economics and cognitive science. They argue that scarcity operates primarily as a cognitive frame that absorbs attentional resources and constrains mental bandwidth. When individuals lack something essential (money, time, or emotional support) their cognitive resources become disproportionately focused on that shortfall. The authors call this attentional narrowing *tunneling*: a psychological state where immediate needs dominate mental processing while peripheral or long-term considerations are neglected. Tunneling produces a paradoxical pattern. It can temporarily heighten focus and motivation—someone under deadline pressure may work more efficiently. Yet it also leads to systematic judgment errors and planning failures. Individuals under scarcity become present-biased, favoring immediate rewards over future benefits and making choices that perpetuate their own deprivation. Central to this model is *cognitive bandwidth*—the total capacity available for attention, working memory, and executive control. Scarcity drains this bandwidth, leaving fewer resources for reflection, self-regulation, and decision-making (Mullainathan & Shafir, 2013).

The authors ground their theory in laboratory and field experiments revealing how scarcity systematically alters thought and behavior. One striking demonstration comes from a field experiment with sugarcane farmers in India. These farmers receive most of their annual income immediately after harvest, experiencing predictable cycles of scarcity (pre-harvest) and abundance (post-harvest). Testing the same individuals in both periods, researchers found farmers performed significantly worse on cognitive tasks before harvest—equivalent to a temporary loss of 10–13 IQ points—compared to after. Since participants were identical across conditions, these effects reflected not innate ability or education but solely the psychological state induced by scarcity. In a complementary experiment at a New Jersey shopping mall, participants from varying income levels imagined a car repair costing either \$300 or \$3,000, then completed cognitive tasks. When the cost was low, rich and poor participants performed equally well. When high, lower-income participants showed marked cognitive decline while wealthier ones remained unaffected. The mere thought of a financially threatening scenario, without real deprivation, consumed mental bandwidth, demonstrating that scarcity's cognitive effects can be triggered by perception alone.

To describe this distinctive mental state, the authors coined the term *scarcity mindset*: when resources are limited, immediate problems appear more urgent and capture the mind, inducing intense focus on pressing tasks. This heightened focus may improve short-term performance but simultaneously narrows attention, leading individuals to overlook future expenses or long-term consequences. Over time, this attentional neglect creates a self-reinforcing cycle of urgency and depletion, a cognitive trap from which escape becomes increasingly difficult (Shah et al., 2012).

Importantly, while the scarcity mindset was originally developed to capture the cognitive consequences of economic scarcity, subsequent research demonstrates that similar mechanisms are triggered by perceived lack of other vital resources. Shah and colleagues (2019)

replicated their findings by experimentally inducing shortages across monetary, temporal, and social domains, consistently observing parallel cognitive outcomes. These results suggest scarcity exerts a domain-general influence on attention, planning, and decision-making, regardless of the specific resource at stake. Extending this perspective, Hu et al. (2024) investigated job scarcity effects and found that individuals perceiving employment opportunities as scarce adopt fast, short-term, efficiency-oriented job-search strategies at the expense of slower, more deliberate, long-term approaches. This behavioral pattern mirrors the scarcity mindset's cognitive dynamics, where attentional narrowing promotes immediate problem-solving but undermines strategic foresight. Jiang et al. (2024) focused on time scarcity, showing that perceived lack of time alters how individuals treat others, shaping interpersonal decisions and social interactions. A related contribution from Denti et al. (2024) documented scarcity mindset among Swedish schoolteachers. In schools where resources were perceived as insufficient, teachers exhibited hallmark features of scarcity cognition: cognitive tunneling, borrowing from the future, and resource skimping. These findings highlight how perceptions of insufficiency can pervade professional contexts, shaping cognition and behavior even without objective deprivation. Finally, accumulating cross-cultural evidence indicates the scarcity mindset is a widespread psychological phenomenon. While specific resources valued and prioritized may vary across cultures, reflecting differing economic structures and social norms, the underlying cognitive and emotional mechanisms triggered by perceived insufficiency appear remarkably consistent (Lamont et al., 2017). Thus, scarcity operates as a universal psychological frame that reshapes attention, motivation, and behavior whenever people experience a gap between their perceived needs and available means.

3.3 – How scarcity reshapes cognition, emotion, and choice

Building on the theoretical framework established above, recent research has mapped the specific cognitive, emotional, and behavioral mechanisms through which scarcity produces its effects, identifying the neurocognitive pathways, affective processes, and decision-making biases that constitute the scarcity trap.

Attentional capture and cognitive filtering

Shah et al. (2018) demonstrated that economic scarcity affects not only cognitive capacity but also thought content itself. People living in scarcity perceive an economic dimension even in seemingly neutral experiences: money becomes a dominant semantic node, with related thoughts emerging spontaneously and resisting suppression, even without explicit cues. In everyday situations—socializing, taking a taxi, grocery shopping—decisions are filtered through immediate cost–benefit considerations, acting as a cognitive filter that narrows the experiential field. Recent research provides detailed insights into the neurocognitive mechanisms underlying this attentional distortion. Zhang et al. (2023), using visual search experiments and electrophysiological measures, found that perceived scarcity does not impair target enhancement—amplification of relevant information—but rather diminishes distractor suppression, the ability to inhibit irrelevant stimuli. The mind under scarcity does not lose focus altogether; it becomes crowded with automatic, scarcity-related thoughts that gradually erode attentional control. Kalil et al. (2023) extended these findings to real-world contexts, showing parents under financial scarcity were over 60% more likely to exhibit attentional difficulties regarding their children's school information, even after accounting for education, internet access, and household size.

Wu et al. (2025) explored a more affective dimension of attention, showing how economic scarcity diminishes the capacity to voluntarily direct thought toward positive mental experiences such as imagination or pleasant recollection. Individuals preoccupied with financial

worries respond more quickly to money-related stimuli and more slowly to positive ones, revealing systematic attentional bias. This interference limits mental pleasure and access to creative or restorative thought, sustaining chronic cognitive focus on lack. Importantly, accompanying emotional strain amplifies attentional narrowing, as anxiety and low perceived control reduce individuals' ability to disengage from scarcity-related thoughts (Zhang, Ma, & Guan, 2023).

Extending the foundational findings on cognitive bandwidth depletion, subsequent studies have documented how scarcity affects specific cognitive functions across diverse contexts and populations. Mani et al. (2020) documented monthly fluctuations in cognitive performance, deteriorating in days preceding payday when financial pressures intensify. This decline reflects not only limited income but also the mental load imposed by uncertainty and the constant need to manage economic constraints. Lichand and Mani (2020) demonstrated that income uncertainty, even more than absolute scarcity, drives cognitive deterioration by inducing mental load and intensifying tunneling. Zhao and Tumm (2018) conceptualized this trade-off as a *focus dividend*: scarcity may temporarily boost concentration on urgent tasks but at the cost of strategic foresight and prospective memory, undermining strategic reasoning and self-regulation. Meta-analytic evidence supports this cognitive depletion model: De Almeida et al. (2024) reported that chronic scarcity significantly reduces cognitive performance, affecting attention, motivation, emotional regulation, and cognitive load.

Research on specific populations confirms this general pattern across diverse contexts. Ambrey (2025) found that among individuals experiencing homelessness, cognitive decline stemmed more from concrete deprivation (skipping meals or selling essential goods) than from homelessness per se, while social support mitigated these effects. Wang et al. (2024) demonstrated that financial scarcity undermines cognitive control by reducing flexibility and interference suppression. Across three experiments with university students, those assigned

smaller budgets responded more slowly and less efficiently than resource-rich peers, showing reduced inhibition and cognitive adaptability, independent of emotional or socioeconomic factors. Chakraborty et al. (2025) reported that perceived scarcity among students leads to cognitive fatigue and poorer learning efficiency, while Johnson and colleagues (2025) found that among women with psychiatric and substance-use disorders, scarcity associates with heightened craving, worse mental health, and lower treatment adherence.

Executive function impairment

Executive functions, including cognitive flexibility, inhibitory control, and working memory, represent one of the domains most sensitive to scarcity. Huang and colleagues (2023) showed that perceived scarcity reduces cognitive flexibility, increases task-switching costs, and alters neural correlates of mental updating. Individuals under scarcity display greater rigidity and lower updating ability, with direct consequences for complex problem-solving. Stress plays a central mediating role in these effects. O'Neill et al. (2021) found that financial scarcity affects executive functions indirectly via stress: greater economic strain produces higher stress levels and greater impairment in behavioral, emotional, and metacognitive regulation. This effect is especially pronounced among individuals exposed to early-life scarcity, suggesting chronic poverty leaves a cognitive imprint of executive vulnerability. At a global level, Hilbert et al. (2025), analyzing data from 51 societies, identified perceived lack of control as a key mechanism linking scarcity to self-regulatory deficits. Feelings of helplessness and loss of control thus act as transversal mechanisms connecting scarcity, stress, and impaired self-regulation, representing an important affective bridge between cognition and emotion that explains why scarcity simultaneously diminishes performance and increases anxiety (Jachimowicz et al., 2022; Zhang, Ma, & Guan, 2023). This evidence resonates with Chou et al. (2016) finding that both objective and perceived economic insecurity heighten physical pain

and distress by undermining perceived control—suggesting the mental load of scarcity is inseparable from its embodied emotional impact.

Decision-making biases and behavioral consequences

The cognitive and self-regulatory depletion documented above directly shapes decision-making patterns. Shah and colleagues (2012) proposed that scarcity's attentional focus improves performance on immediate problems but distorts decision-making by diverting resources from broader goals and future considerations. Schilbach et al. (2016) elaborated that bandwidth depletion produces variability and inconsistency in choices, lower patience in intertemporal trade-offs, and greater risk-taking when immediate relief is available. Shafir (2017) described this as a chronic *attentional tax* that locks the mind in the present, systematically biasing temporal and probabilistic reasoning.

Liang Yu et al. (2024) showed that bandwidth depletion undermines both self-efficacy and self-control, jointly impairing individuals' capacity to delay gratification and sustain goal-directed effort. These cognitive impairments are amplified by emotional mechanisms: anxiety and reduced self-efficacy under scarcity make future-oriented effort seem less controllable and more aversive, fostering preference for smaller-sooner rewards in a self-reinforcing cycle. Zeng et al. (2023) experimentally confirmed that perceived time scarcity increases delay discounting, mediated by anxiety and moderated by perceived control, showing emotional regulation can buffer scarcity's impact on intertemporal decision-making.

Importantly, scarcity's effects on decision-making are not uniform. Carvalho et al. (2025) identified dual self-regulatory pathways: individuals experiencing scarcity may follow either a high self-regulation route, characterized by frugality and deliberate control, or a low self-regulation route, marked by impulsivity and compensatory spending. These divergent responses illustrate how scarcity can simultaneously foster cautious planning in some individuals and debt accumulation in others, depending on self-regulatory capacity. Caballero

et al. (2021) found that scarcity induces more concrete construal, emphasizing tangible, immediate aspects of choice over abstract, long-term considerations, though interventions restoring abstract thinking can partially reverse this effect.

At the neural level, Huijsmans et al. (2019) reported that scarcity cues heighten orbitofrontal activation, enhancing immediate reward valuation, while reducing dorsolateral prefrontal activity, weakening executive control and goal maintenance. These neural patterns mirror behavioral outcomes, highlighting how scarcity reorganizes both cognitive resources and the mechanisms through which preferences and trade-offs are constructed (see also De Bruijn & Antonides, 2022).

3.4 – Scarcity and social behavior: Does scarcity increase cooperation or selfishness?

While the preceding evidence demonstrates how scarcity constrains individual cognition and decision-making, its consequences extend beyond isolated choices. In social contexts, individuals must decide not only how to allocate their own limited resources but also whether to share with others, cooperate toward common goals, and trust those around them. The effects of bandwidth depletion, emotional distress, and impaired self-regulation thus shape prosocial behavior in ways that are both adaptive and counterintuitive.

The Paradox: Does Scarcity Foster Cooperation or Competition?

The relationship between scarcity and social behavior represents one of the most paradoxical findings in the literature. Empirical evidence reveals seemingly contradictory patterns: some studies document increased generosity, cooperation, and trust under scarcity, while others report heightened selfishness, reduced sharing, and parochialism. This inconsistency suggests that scarcity produces context-dependent responses shaped by individual characteristics, social norms, and ecological factors.

Evidence for Enhanced Prosociality

One influential research line shows that individuals with fewer resources often display greater prosociality. Piff et al. (2010) demonstrated that lower social class membership associates with increased generosity, trust, and helping behavior across multiple experimental paradigms. In dictator games, participants from disadvantaged backgrounds allocated larger shares to strangers, while those induced to perceive themselves as lower class expressed greater willingness to donate income to charity. The authors argued that individuals with fewer resources develop greater dependence on others and sensitivity to social context, fostering prosocial orientations as adaptive strategies. Civai et al. (2022) provided convergent evidence during the COVID-19 pandemic: socio-psychological scarcity, particularly lack of social contact, predicted greater cooperation in public goods games, while material scarcity did not, suggesting distinct psychological mechanisms. Similarly, Nie et al. (2020) found that Chinese farmers facing water scarcity exhibited higher cooperation in irrigation management and experimental games, particularly among older cohorts with stronger collective norms. Where resource scarcity requires coordinated management, scarcity strengthens cooperation by increasing interdependence and consolidating prosocial norms.

Evidence for Reduced Prosociality

However, other research documents how scarcity undermines prosocial behavior by depleting cognitive resources, intensifying competition, and activating self-protective strategies. Agneman et al. (2022) measured trust among Tanzanian farmers before and after harvest. During the lean season, when food scarcity peaked, participants invested significantly less in trust games, particularly toward outgroup members. Scarcity salience further reduced trust, with the strongest effect in subsistence-dependent communities. The authors concluded that scarcity reduces trust precisely when cooperation would be most beneficial, undermining social capital when most needed. Similarly, Roux and colleagues (2015) demonstrated that

scarcity reminders activate a competitive orientation motivating self-focused behavior. Scarcity primes increased accessibility of competition-related concepts and reduced charitable donations, effects mediated by motivation to protect personal resources. This competitive orientation explains why scarcity systematically reduces trust and cooperation even when collectively beneficial.

These patterns transmit intergenerationally. Zheng et al. (2023) examined how parental scarcity mindsets influence offspring's cooperation in 239 parent-child dyads in China. Parents' scarcity mindsets correlated positively with children's scarcity mindsets, both negatively associated with cooperation in public goods games. Parental scarcity mindsets reduced children's cooperation through two pathways: transmission of scarcity cognitions and children's observation and imitation of parental competitive behavior. Scarcity's detrimental effects on prosociality thus become embedded in family socialization and reproduced intergenerationally, suggesting that social costs of resource constraints compound over time, creating enduring patterns of competitive rather than cooperative engagement.

The erosion of trust and cooperation under scarcity compounds through broader social disconnection. Noordewier et al. (2025) found that financial scarcity predicts increases in perceived social exclusion over time (and vice versa) creating a vicious cycle between economic hardship and isolation. Doolaard et al. (2021) corroborated this reciprocal dynamic: perceived financial scarcity and social exclusion reinforce each other through weakened social networks, reduced participation, and stigmatization. Reduced social capital and stigma perpetuate vulnerability even without objective income changes. High-density environments exacerbate these patterns. Tan et al. (2024) found that high density reduced cooperation in dictator games, but only among individuals perceiving resource scarcity. Those with abundant resources were unaffected or even increased cooperation, possibly for reputational benefits.

Scarcity thus activates competitive mechanisms in crowded environments, while abundance permits strategic generosity.

Reconciling the Paradox: An Integrative Framework

Civai and colleagues (2024) proposed an integrative framework reconciling these contradictions. They argued that scarcity's cognitive effects interact with individual traits and contextual factors to generate variable outcomes. Prosocial behavior increases when cooperation helps recover scarce resources or when strong norms support sharing; it decreases when scarcity triggers egoistic strategies or weakens normative expectations. Consistent with this framework, individual differences in empathy emerge as a key moderator. Cui et al. (2022) demonstrated that empathic capacities buffer scarcity's negative effects on resource sharing. In experimental paradigms where participants allocated relief time under varying scarcity, those with greater empathy continued sharing even when resources were highly insufficient. Neuroimaging revealed that scarcity modulated activity in mentalizing regions, with reduced connectivity in low-empathy individuals. Oxytocin administration increased sharing only in high-empathy participants, suggesting that prosocial resilience under scarcity depends on pre-existing empathic capacity. This protective role extends to time scarcity: Liu et al. (2023) found that while time pressure generally reduced willingness to help others, individuals with higher empathy maintained prosocial responses even under urgency, engaging brain regions involved in perspective-taking and moral evaluation. Moreover, the type of distress matters: while scarcity typically reduces empathy for physical pain, Li et al. (2025) showed that scarcity mindsets can amplify empathy specifically for social pain. Participants primed with scarcity showed greater concern for socially excluded individuals, with neural evidence suggesting scarcity-induced cognitive elaboration can compensate for lower trait empathy in such contexts. The authors proposed that under scarcity, individuals may seek relational security through prosocial engagement, revealing that scarcity's impact on empathy depends critically on

whether others experience physical versus social suffering. Beyond empathy, social norms critically moderate scarcity's effects. Luo et al. (2025) demonstrated that scarcity mindsets increase cooperation only when prosocial norms are strong; under weak norms, scarcity had no effect, with individuals adhering more closely to prevailing norms as an adaptive strategy. Li et al. (2023) showed that scarcity reduces generosity by reinforcing unequal allocation norms, though this effect was attenuated when egalitarian norms were made salient. Person-thing orientation also matters: Malika et al. (2024) found that person-oriented individuals shifted from donating time to money under time scarcity, while thing-oriented individuals showed the opposite pattern under financial scarcity.

This body of evidence reveals that scarcity does not uniformly increase or decrease prosocial behavior. Rather, its effects depend on scarcity type (material vs. social vs. temporal), the nature of others' suffering (physical vs. social pain), the presence and strength of prosocial norms, individual characteristics such as empathy and social orientation, intergenerational transmission of scarcity mindsets, and ecological factors including population density and resource interdependence. Where cooperation is normatively supported, functionally necessary, or emotionally accessible through empathy, scarcity can enhance prosociality. In contexts characterized by weak norms, high competition, or limited cognitive resources, scarcity triggers self-protective strategies that reduce sharing and trust.

3.5 – From scarcity to interpersonal objectification: Does Theory of Mind protect or falter?

Throughout this chapter, it has been demonstrated how scarcity profoundly reshapes cognition, executive functions, emotional regulation, and social behavior patterns. As illustrated, scarcity's effects on prosocial behavior are paradoxical and context-dependent. Notably, scarcity frequently, though not invariably, promotes a goal-oriented and competitive

mindset that prioritizes resource acquisition over relational considerations. While acknowledging that scarcity can sometimes yield positive interpersonal outcomes under specific conditions, the present work deliberately focuses on investigating a potentially detrimental consequence that has received limited empirical attention: the possibility that scarcity may create fertile ground for interpersonal objectification by encouraging people to perceive others instrumentally, as means to personal ends rather than as individuals with their own mental states and intrinsic worth. This hypothesis draws theoretical support from the convergence of multiple mechanisms documented in the scarcity and objectification literatures. Moreover, this investigation extends to examining whether Theory of Mind (ToM) may serve as a protective factor against such objectifying tendencies, or whether it too becomes compromised under conditions of scarcity, thereby failing to buffer against the instrumentalization of others.

Goal orientation and competitive mindset

First, scarcity fundamentally reshapes motivational priorities in ways that mirror known antecedents of objectification. As demonstrated in Chapter 1, contextual factors promoting self-interest, competition, and calculative thinking consistently increase objectification. Economic inequality intensifies self-enhancement goals and activates a calculative mindset that promotes perceiving others in terms of their utility for personal advancement (Cheng et al., 2022, 2024), while exchange orientation amplifies instrumental approaches toward others and reduces relational satisfaction (Wang et al., 2022). Scarcity operates through analogous pathways: it narrows attention toward specific goal achievement, intensifies focus on protecting personal resources, activates competitive schemas, and promotes self-centered, goal-oriented decision-making (Roux et al., 2015; Schilbach et al., 2016). This heightened goal orientation transforms social perception: when individuals become singularly focused on achieving their objectives,

others are more readily evaluated through the lens of their contribution to these goals rather than as complex beings with independent value.

A compelling demonstration comes from recent research on time scarcity and interpersonal objectification (Jiang et al., 2024). The authors showed that both chronic perceptions of time scarcity and experimentally induced time pressure increase the tendency to view others as instruments for achieving personal goals. This effect operated through increased agentic orientation (intensified focus on goals and personal efficacy) and decreased communal orientation (diminished focus on relationships and others' well-being). As individuals become hyper-focused on task completion and goal achievement, social interactions are increasingly filtered through their instrumental value for advancing personal objectives. Remarkably, this goal-driven instrumentalization occurred even toward close friends and extended to individuals with naturally prosocial dispositions, albeit to a lesser degree. The authors argue that time scarcity reallocates cognitive resources toward goal-directed task completion, relegating relational aspects to the background and fostering a utilitarian construction of interpersonal value where others are valued primarily for their capacity to facilitate goal attainment.

Attentional tunneling and money salience

Second, the attentional distortions produced by scarcity create a cognitive environment particularly conducive to instrumental social perception. Economic scarcity acts as a powerful attentional filter that narrows experiential focus and makes resource-related concerns cognitively dominant (Shah et al., 2018). This tunneling effect fundamentally reshapes thought content, making economic considerations spontaneously intrusive across contexts. Shah et al. (2018) demonstrated that individuals under economic scarcity experience intrusive money-related thoughts that monopolize mental bandwidth through narrowed attentional focus on immediate resource concerns.

This attentional mechanism connects directly to objectification processes. Money salience represents a powerful cognitive and motivational prime for objectification: money cues reliably activate market-pricing mindsets that increase instrumental thinking and cost-benefit evaluation of social relationships, thereby promoting the objectification of others (Teng et al., 2016b; Vohs et al., 2006; Vohs, 2015; Wang et al., 2020; Zheng et al., 2025). Economic scarcity may underlie this effect by keeping money chronically salient in consciousness, creating a persistent cognitive backdrop through which social interactions are interpreted. When scarcity continuously channels attention toward money and resource protection, the cognitive availability of monetary schemas inevitably spills over into social cognition. Others are thus more easily perceived through an instrumental lens, and valued for what they can provide rather than recognized as ends in themselves, that is, objectified.

Impulsivity and short-term orientation

Third, scarcity alters the temporal dynamics of choice, promoting impulsive preferences and strong short-term orientation. People under scarcity rely more heavily on immediate decision-making processes, showing greater sensitivity to temporally proximate rewards and reduced tolerance for delay (Shafir, 2017; Shah et al., 2012). This shift emerges through attentional tunneling and through emotional mechanisms such as anxiety and diminished sense of control, which render future benefits cognitively more distant and subjectively less relevant (Liang Yu et al., 2024; Zeng et al., 2023).

The impulsivity and preference for short-term benefits characteristic of scarcity have direct implications for interpersonal objectification. When attention is absorbed by contingent needs and focus is oriented exclusively on the immediate, relationships that fail to offer rapid, tangible advantages become uninteresting or even irrelevant. Others are thus evaluated primarily in terms of their immediate utility for resolving pressing problems, while relationships requiring long-term investment or yielding deferred benefits may be neglected or devalued.

This pattern is further facilitated by the tendency toward concrete construal observed under scarcity (Caballero et al., 2021), which reduces the capacity to represent others in complex or abstract terms. People are therefore apprehended through traits immediately relevant to action or task resolution, rather than as agents endowed with mental states and intrinsic value. Collectively, these mechanisms suggest that the temporal dimension of scarcity, its orientation toward the immediate and its weakening of prospective regulation, constitutes an additional psychological pathway that fosters instrumental and utilitarian perception of others.

In light of these considerations, scarcity may create fertile ground for interpersonal objectification. However, as emerged in the previous section, the effects of scarcity on interpersonal behavior are markedly heterogeneous and depend critically on individual and contextual factors. This variability suggests that certain psychological factors may continue to protect against objectification even under scarcity.

Theory of Mind as a protective factor

ToM emerges as a particularly promising protective factor against interpersonal objectification under conditions of scarcity. As discussed in Chapter 2, ToM enables individuals to represent others as intentional and sentient agents, thereby restoring their psychological complexity and moral dignity. If objectification involves denying others' minds, ToM represents its opposite, a counter-process of re-humanization.

As documented in the previous section, individual dispositions that direct attention toward others' social and mental dimensions can resist scarcity's tunneling effect and maintain prosocial behavior even under resource constraints (Cui et al., 2022; Liu et al., 2023; Malika et al., 2024). Within the integrative framework proposed by Civai et al. (2024), ToM may represent a critical individual trait that modulates the direction of scarcity's effects, enabling individuals to maintain a broader, relationally oriented perspective even when cognitive tunneling pushes toward narrow focus on immediate resources. Moreover, findings from the first part of the

present research showed that ToM can indeed be considered a protective factor against objectification: multiple measures of ToM consistently displayed negative associations with objectification, and following targeted training, participants exhibited significant reduction in their tendency to objectify others (see Chapter 2).

However, this protective potential faces a crucial vulnerability: ToM itself is a cognitively demanding capacity that may be compromised by scarcity's effects on cognitive functioning. Given that scarcity increases cognitive load and impairs overall performance by consuming mental resources (as illustrated throughout this chapter), and that ToM requires considerable attentional focus and mental energy (Lin et al., 2010), scarcity could potentially compromise ToM functioning itself.

This raises two competing theoretical possibilities. On one hand, ToM may maintain its protective role even under scarcity, enabling individuals with high mentalizing capacities to resist objectifying tendencies despite cognitive constraints. On the other hand, if scarcity sufficiently diminishes ToM capacity, it would disable the protective mechanism that could otherwise restrain objectification. In this scenario, scarcity would create a dual pathway promoting interpersonal objectification: directly, by narrowing attentional focus toward scarce resources and away from others' humanity; and indirectly, by impairing the cognitive mechanism that enables recognition of others as complex mental agents. Determining which prediction holds true—whether ToM remains protective under scarcity or is itself undermined by it—represents a critical empirical question that fundamentally shapes understanding of how individual differences in social cognition interact with situational factors to influence interpersonal relationships.

3.6 – Scope and overview of the second part of the research project

Building on the findings from the first part and the evidence presented in this chapter, the second part of the research project addressed a critical gap in understanding the social and contextual antecedents of interpersonal objectification. As documented throughout Chapter 3, scarcity has become increasingly pervasive in contemporary society. Importantly, scarcity is not experienced exclusively by those living in extreme poverty, but rather manifests whenever individuals perceive their resources as insufficient or inadequate, an effect that occurs across different forms of scarcity (e.g., time, money, social support). Given scarcity's profound impact on cognition, emotion regulation, and social behavior—particularly its tendency to promote goal-oriented, competitive mindsets and instrumental thinking—this research part was designed to test the novel hypothesis that scarcity may foster interpersonal objectification, potentially explaining its widespread occurrence in modern societies. Furthermore, building on the protective role of ToM identified in the first research part, a second key objective was to determine whether ToM continues to buffer against interpersonal objectification even when objectifying tendencies are heightened under conditions of scarcity, or whether ToM itself is undermined by scarcity, and, if so, whether such impairment contributes to increased objectification. These competing theoretical possibilities translate into distinct hypotheses: in the first scenario, ToM would function as a moderator, attenuating the relationship between scarcity and objectification by protecting individuals with high ToM capacities from scarcity's objectifying effects; in the second scenario, ToM would operate as a mediator, with scarcity first impairing ToM functioning, which in turn increases objectification, thereby representing an indirect pathway through which scarcity promotes interpersonal objectification.

To investigate these hypotheses and following the first part of the present research project, four empirical studies were conducted in collaboration with the Social Psychology of Inequality Lab at the University of Granada, Spain, under the supervision of Professor Rosa

Rodríguez Bailón and Professor Rocío Martínez. Each study was designed to examine a specific facet of the proposed relationship between scarcity, objectification, and ToM, progressing from correlational to experimental approaches and culminating in more nuanced analyses. The first study of this second part of the research project (Study 4) employed a correlational design to establish what associations exist between scarcity, interpersonal objectification, and ToM, testing both the moderating and mediating roles of ToM in the scarcity-objectification relationship. This initial investigation served to map potential relationships and uncover patterns meriting deeper analysis. Building on these initial findings, the second and the third studies (Study 5a and 5b) adopted an experimental approach with two distinct manipulations to test the causal nature of these relationships, specifically examining whether inducing scarcity increases objectifying tendencies and affects ToM functioning. The fourth study (Study 6) extended the experimental logic by leveraging a recent real-world event to test these same hypotheses through a more ecologically valid lens, thereby bridging laboratory findings with lived experience. Finally, the last correlational study (Study 7) aimed to deepen understanding by unpacking scarcity into its psychological components, examining the specific roles of perceived inequality, money salience, and short-term orientation in relation to interpersonal objectification and ToM, considering both moderating and mediating pathways.

All hypotheses, methods, and experimental materials of the studies conducted in this second part of the research project were pre-registered and are available on the Open Science Framework: <https://osf.io/ehbd6/overview>

3.7 – Study 4: First correlational evidence on the relationship between scarcity, interpersonal objectification and ToM

Study 4 was designed to provide correlational evidence about the relationship between scarcity, interpersonal objectification and ToM, testing both the moderating and mediating roles

that ToM might play in this relationship. Accordingly, it was hypothesized that higher levels of scarcity would be associated with a stronger tendency to objectify others (*Hp1*). In line with the findings from the first part of the present research, it was further hypothesized that higher levels of ToM would be associated with lower levels of interpersonal objectification (*Hp2*). Given the two competing theoretical possibilities outlined above, two alternative sets of hypotheses were formulated regarding ToM's role. According to the moderation hypothesis, ToM functions as a protective buffer: ToM would moderate the impact of scarcity on interpersonal objectification, such that individuals with higher ToM capacities would show attenuated increases in objectifying tendencies when experiencing scarcity (*Hp3a*). Alternatively, according to the mediation hypothesis, ToM itself is undermined by scarcity: higher levels of scarcity would be associated with lower levels of ToM, and this scarcity-induced impairment in ToM would, in turn, contribute to increased objectification. In other words, ToM would mediate the relationship between scarcity and objectification, representing an indirect pathway through which scarcity promotes interpersonal objectification (*Hp3b*).

Method

Participants

For this and the subsequent studies, the aim was to recruit a heterogeneous sample of participants in terms of age and socio-cultural background. To achieve this, research assistants relied on a snowball sampling procedure. Following Schönbrodt and Perugini's (2013) recommendations, according to which a sample of approximately 250 participants ensures adequate statistical power for comparable cross-sectional designs, 297 individuals were initially recruited. From this pool, 8 participants were excluded due to incomplete responses (i.e., failure to complete one or more scales). The final sample therefore consisted of 289 participants (171 women, 117 men, and 1 who preferred not to answer; *M*_{age} = 36.00 years, age range = 18–85, *SD* = 15.2). All participants were Italian. Regarding educational attainment, 8.3% had

completed middle school, 43.9% held a high school diploma, 21.8% held a bachelor's degree, 22.1% held a master's degree, and 3.8% reported obtaining a postgraduate qualification (master's or PhD). In terms of income distribution, the largest proportion of participants reported earning between €10,000 and €25,000 per year (35.6%) or between €25,000 and €50,000 (34.6%). Lower-income (below €5,000) and higher-income (above €100,000) categories were less represented, accounting for 1.7% and 2.8% of the sample, respectively.

Procedure and materials

All participants completed an online survey that included the measures described below, which were presented in random order across respondents.

Scarcity was assessed using the Italian translation of the *Psychological Inventory of Financial Scarcity* (Van Dijk et al., 2022), a 12-item scale measuring subjective financial scarcity on a 7-point Likert agreement scale ($\alpha = .87$; e.g., “I often do not have enough money to pay for the things I really need”; “I constantly wonder whether my money will be sufficient”).

Interpersonal objectification was assessed with two measures: the *Relations Objectification Scale* (Lachowicz-Tabaczek et al., 2021), already employed in the first part of the present research, which focuses on the individuals' general tendency to perceive interpersonal relationships instrumentally (see Chapter 2) and the Italian translation of the *Objectification Scale* (Belmi & Schroeder, 2021), which addresses additional dimensions of objectification described by Nussbaum (1995) through 7 items rated on a 7-point Likert agreement scale (e.g., “I respect other people's ability to think for themselves”; “I spend time only with people who are immediately useful to me”). In order to obtain a more comprehensive assessment of interpersonal objectification, the two measures were combined and treated as a single scale for the purposes of analysis. To validate this approach, an exploratory factor analysis (EFA) was conducted using the minimum residual extraction method with oblimin rotation. The Kaiser-Meyer-Olkin (KMO) measure indicated excellent sampling adequacy

(KMO = .91), and Bartlett's test of sphericity was significant, $\chi^2(136) = 1604.63$, $p < .001$, confirming the suitability of the data for factor analysis. The EFA revealed a clear one-factor solution, with the first factor accounting for 31.96% of the total variance and an eigenvalue of 5.43. All items loaded above .40 on this single factor, and no additional factors exceeded the eigenvalue > 1 criterion. Model fit indices indicated an acceptable fit (RMSEA = .076, 90% CI [.066, .087]; TLI = .843), and the combined scale demonstrated high internal consistency ($\alpha = .87$). These results supported the decision to merge the two original subscales into a single composite measure of interpersonal objectification.

Finally, ToM was measured with the *Theory of Mind Inventory* (Hutchins et al., 2020), which had also been used in the first part of the present research (see Chapter 2; $\alpha = .92$). At the end of the survey, participants responded to a set of socio-demographic questions (age, gender, nationality, education, and income) and were then debriefed and thanked.

Results

Table 3.1 reports correlations among variables. In line with *Hp1*, scarcity showed a small positive association with interpersonal objectification, indicating that individuals who perceive greater scarcity tend to report higher levels of interpersonal objectification.

Table 3.1.

Correlation Matrix for Study 4 variables

	M	SD	1	2
1 Scarcity	3.07	1.06	—	
2 Interpersonal objectification	2.15	0.71	.12*	—
3 ToM	5.09	0.65	-.05	-.35**

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

Supporting *Hp2* and confirming findings from the first part of the present research, ToM was negatively associated with interpersonal objectification. This coefficient exceeds the

threshold for a large effect (Funder & Ozer, 2019), suggesting a substantial association, whereby higher ToM is linked to notably lower levels of interpersonal objectification.

Two analytical models were estimated to evaluate the competing hypotheses regarding whether ToM functions as a moderator or mediator of the relationship between scarcity and interpersonal objectification (see Table 3.2).

Table 3.2.

Moderation and mediation analyses of the association between scarcity, ToM, and interpersonal objectification

Effect	95% Confidence Interval				t	p
	b	SE	Lower	Upper		
Moderation model						
Scarcity → Objectification	0.11	0.06	0.00	0.22	1.97	.050
ToM → Objectification	−0.35	0.06	−0.45	−0.24	−6.28	< .001
Scarcity × ToM	−0.06	0.05	−0.17	0.04	−1.17	.242
Model R ²	.14	—	—	—	—	< .001
ΔR ² (interaction)	.004	—	—	—	—	.242
Mediation model						
Scarcity → ToM (a-path)	−0.05	0.06	−0.17	0.06	−0.89	.377
ToM → Objectification (b-path)	−0.35	0.05	−0.46	−0.24	−6.37	< .001
Scarcity → Objectification (total effect)	0.12	0.06	0.00	0.23	2.03	.044
Scarcity → Objectification (direct effect)	0.10	0.05	−0.01	0.21	1.83	.069
Indirect effect via ToM	0.02	0.02	−0.02	0.06	—	—
Model R ² (mediation)	.14	—	—	—	—	< .001

Note. Standardized variables were used. Indirect effect based on 5,000 bootstrap samples. ToM = Theory of Mind.

The moderation model (PROCESS Model 1; Hayes, 2018) included scarcity as the predictor, interpersonal objectification as the outcome, and ToM as the moderator. The overall model was significant. Scarcity showed a small positive association with objectification, consistent with *H_{p1}*. ToM exhibited a robust negative association with objectification,

replicating findings from the first research part and supporting *Hp2*. However, contrary to *Hp3a*, the interaction between scarcity and ToM did not reach significance. The change in explained variance attributable to the interaction was minimal, indicating that ToM did not moderate the effect of scarcity on interpersonal objectification. These findings do not support the moderation hypothesis: individuals with higher ToM capacities did not show attenuated increases in objectifying tendencies under scarcity.

The mediation model (PROCESS Model 4; Hayes, 2018) tested whether scarcity predicts ToM, which in turn predicts objectification, thereby representing an indirect pathway. Contrary to *Hp3b*, scarcity did not significantly predict ToM, providing no evidence that scarcity undermines ToM capacities. Consistent with *Hp2*, ToM strongly predicted lower objectification. The total effect of scarcity on objectification was significant, consistent with *Hp1*. However, the direct effect, controlling for ToM, remained significant, and the indirect effect through ToM was nonsignificant, as the confidence interval included zero. Therefore, no evidence for mediation emerged.

The absence of these effects raises critical methodological considerations. While moderation can be reasonably tested with correlational data, testing mediation is inherently problematic with such designs. Mediation processes are fundamentally causal, requiring the demonstration that scarcity causally reduces ToM, which in turn causally increases objectification, a directional sequence that correlational data cannot establish. Nevertheless, this study provides the first empirical evidence of a direct association between scarcity and interpersonal objectification, a novel finding that supports our theoretical framework and warrants further investigation. The subsequent studies were therefore designed primarily to address this limitation by experimentally manipulating scarcity and testing the mediation pathway, thereby allowing for a more rigorous examination of whether scarcity causally undermines ToM capacities, which subsequently increases objectifying tendencies.

3.8 – Study 5a and 5b: Experimental Tests of Scarcity’s Effects on Objectification and Theory of Mind

To deepen understanding of the relationship between scarcity and interpersonal objectification observed in Study 4, and particularly to test its causal direction, Study 5a and 5b adopted an experimental design to examine whether perceiving scarcity leads people to objectify others more intensely. Beyond establishing causality, Study 5a and 5b also sought to clarify the role of ToM in this process as mediator, by testing whether scarcity might impair ToM functioning, weakening a critical defense mechanism against interpersonal objectification, and thus creating a dual pathway through which scarcity promotes the treatment of others as mere objects or instruments through the mediation of impaired ToM.

Accordingly, Study 5a and 5b tested three core hypotheses: first, that participants exposed to scarcity manipulation would exhibit higher levels of interpersonal objectification compared to those in the no-scarcity condition (*H_{p1}*); second, that scarcity manipulation would reduce ToM performance, reflecting the cognitive impairment pathway through which scarcity undermines this protective capacity (*H_{p2}*); and third, that the effect of scarcity on interpersonal objectification would be partially mediated by ToM impairment (*H_{p3}*). In other words, scarcity may increase objectification both directly and indirectly by diminishing individuals’ ability to recognize others as mental agents, thereby weakening a critical defense against objectifying tendencies. To address these objectives, two different experimental manipulations were employed, each utilizing a distinct approach to inducing scarcity perceptions and assessing ToM functioning.

Study 5a

Method

Participants

The sample size was determined through a Monte Carlo power analysis for mediation models with one mediator (Schoemann et al., 2017). Conservative effect sizes and simulation parameters were selected to ensure robust estimates ($r = 0.02$, $1-\beta = 0.80$, 5,000 replications, 20,000 draws, 95% Monte Carlo confidence level). Additionally, to test the effect of the experimental scarcity manipulation on the dependent variables, power was calculated for a MANOVA model using G*Power software (Faul et al., 2007). This analysis, based on a conservative effect size, a conventional power threshold, and two groups ($f = 0.10$, $1-\beta = 0.80$, $\alpha = .05$), yielded a minimum required sample size of 100 participants. The final target incorporated both requirements, prioritizing the more conservative estimate of 250 participants.

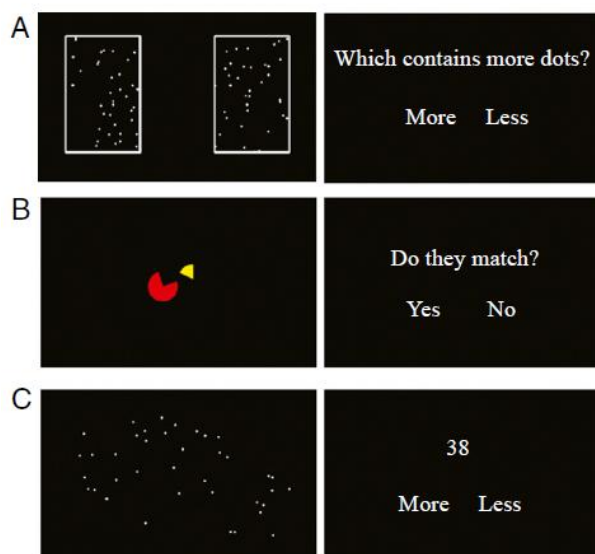
To ensure a sufficiently heterogeneous sample, participants were recruited using a snowball sampling procedure. A total of 775 participants were initially recruited. From this pool, 268 participants were excluded due to incomplete responses (i.e., failure to complete one or more scales), and 2 for inaccurate responses to the two attentional check items. The final sample consisted of 505 participants (297 women, 206 men, and 2 who identified as “other”; $M_{\text{age}} = 33.39$ years, age range = 18–79, $SD = 16.47$). All participants were Italian. Regarding educational attainment, 5.8% had completed middle school, 65.9% held a high school diploma, 11.5% held a bachelor’s degree, 11.9% held a master’s degree, and 5.0% reported obtaining a postgraduate qualification (master’s or PhD). In terms of income distribution, 6.7% reported earning less than €10,000 per year, 25.6% between €10,000 and €25,000, 38.5% between €25,000 and €50,000, 15.9% between €50,000 and €75,000, 8.5% between €75,000 and €100,000, and 4.8% more than €100,000 per year.

Procedure and materials

The study was conducted online. All participants received a link that randomly assigned them to one of two conditions and directed them to the experimental task. In the scarcity condition, participants were induced to perceive resources as limited and difficult to obtain, whereas in the non-scarcity condition, resources were presented as abundant and easily accessible. The manipulation was implemented through an adaptation of the *Stage Games paradigm*, a task in which participants accumulate tokens by correctly completing counting exercises (Huijismans et al., 2019). In the present adaptation, participants in the scarcity condition started with 1 token and were required to reach 7 tokens by the end of each phase (three phases in total), with a 5-second time limit for each response and penalties for mistakes. The task was designed so that participants could not realistically reach the target, thereby inducing a subjective sense of scarcity. Participants in the non-scarcity condition, by contrast, started with 7 tokens and were required only to retain at least 1 token, with no time limits, fostering a perception of abundance and non-scarcity (see Figure 1 for an example).

Figure 3.1.

Example of tasks used in the Stage Games paradigm (Huijismans, et al., 2019)



After the manipulation, participants completed the following measures. Interpersonal objectification was assessed as in Study 4 using a composite scale ($\alpha = .80$) combining the *Relations Objectification Scale* (Lachowicz-Tabaczek et al., 2021) and the *Objectification Scale* (Belmi & Schroeder, 2021). ToM was measured using the *Yoni Task* (Isernia et al., 2024), as in Study 1 (see Chapter 2). Unlike Study 4, the present study employed a performance-based ToM task rather than a self-report scale, enabling the assessment of participants' actual ToM capacities in real time after the manipulation rather than their self-perceived ability. Manipulation checks were specifically developed to assess perceived scarcity, scarcity-induced pressure, frustration, and wellbeing. At the end of the survey, participants answered socio-demographic questions (age, gender, nationality, education, and income) and were then debriefed and thanked.

Results

To examine the effects of the experimental manipulation, a MANOVA was conducted with condition (scarcity vs. no-scarcity) as a fixed factor and including both manipulation check variables and the main dependent variables (interpersonal objectification and ToM performance; see Table 3.2). The analysis revealed that the scarcity manipulation was successful in shaping participants' subjective experience of resource availability ($\lambda = .84$, $F(5,498) = 15.06$, $p < .001$, $\eta^2 = .154$). Specifically, participants in the scarcity condition reported significantly higher perceived scarcity, pressure, and frustration, alongside lower levels of well-being, compared to those in the no-scarcity condition. However, the results did not support *Hp1*, which predicted a direct effect of scarcity manipulation on interpersonal objectification: participants in the scarcity and no-scarcity conditions did not differ significantly in their objectification scores. Similarly, no significant differences emerged for ToM performance, contrary to *Hp2*, which proposed that scarcity would impair participants' ability to correctly infer others' mental and emotional states. Given the absence of effects of the

manipulation on both interpersonal objectification and ToM, the hypothesized partial mediation (*Hp3*) could not be tested. The necessary precondition for a mediation model, namely a significant effect of the independent variable on either the mediator or the outcome, was not met. Importantly, ToM performance was negatively associated with interpersonal objectification at the correlational level, $r = -.016, p < .001$, replicating the pattern observed in previous studies.

Table 3.3.
MANOVA results (Stage games paradigm)

	<i>F</i>	<i>p</i>	Partial η^2	No-scarcity condition		Scarcity condition		
				<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Manipulation checks								
Perception of scarcity	85.17	< .001	.145	2.61	1.53	3.92	1.66	
Scarcity pressure	63.01	< .001	.111	2.80	1.74	4.04	1.77	
Frustration	33.61	< .001	.063	2.90	1.80	3.84	1.83	
Well-being	10.40	.001	.020	4.34	1.32	3.94	1.50	
Dependent variables								
Interpersonal objectification	0.46	.496	.001	2.52	.74	2.56	.68	
ToM	1.65	.199	.003	0.80	.18	0.78	.21	

These null findings are theoretically informative. The manipulation produced clear changes in participants' psychological experience (higher perceived scarcity and affective pressure), suggesting that the absence of effects on objectification and ToM is unlikely attributable to manipulation failure. Rather, the *Stage Games paradigm*, while effective in inducing temporary scarcity sensations, may have been too abstract or task-focused to activate the psychological mechanisms underlying interpersonal objectification. Furthermore, these results suggest that the scarcity-objectification relationship documented in Study 4 may be more chronic or cumulative in nature, emerging primarily when individuals experience scarcity repeatedly or over longer periods, rather than in short-lived experimental exposures.

Additionally, it is possible that the *Stage games paradigm*, while effective in inducing a temporary sensation of scarcity, may have been too abstract or task-focused to activate the psychological mechanisms underlying interpersonal objectification. To address this potential limitation, Study 5b employed a more personal and emotionally engaging manipulation, a recall task requiring participants to reflect on their own lived experiences of financial scarcity.

Study 5b

Method

Participants

As Study 5b represents a variant of Study 5a, the same sample size planning established for Study 5a was applied. A total of 766 participants were initially recruited using a snowball sampling procedure. From this pool, 295 participants were excluded due to incomplete responses (i.e., failure to complete one or more scales), and 6 for inaccurate responses to the two attentional check items. The final sample consisted of 465 participants (301 women, 160 men, and 4 who identified as “other”; $M_{age} = 33.99$ years, age range = 18–91, $SD = 17.06$). All participants were Italian. Regarding educational attainment, 7.1% had completed middle school, 64.1% held a high school diploma, 11.0% held a bachelor’s degree, 13.1% held a master’s degree, and 4.7% reported a postgraduate qualification (i.e., master’s specialization or PhD). In terms of annual income, 4.9% reported earning less than €10,000, 26.9% between €10,000 and €25,000, 37.6% between €25,000 and €50,000, 18.1% between €50,000 and €75,000, 8.0% between €75,000 and €100,000, and 4.5% reported earning more than €100,000 per year.

Procedure and materials

The study was conducted online. All participants received a link that randomly assigned them to one of two conditions and directed them to the experimental task. In the study, scarcity

was manipulated through a recall task adapted from Roux et al. (2015). This manipulation was designed to ensure that participants in the scarcity condition engaged deeply with personal memories of financial constraint and their associated emotions, while those in the non-scarcity condition focused on neutral, everyday experiences unrelated to resource availability.

Participants in the scarcity condition completed a three-step recall procedure designed to activate personal experiences of resource scarcity. First, they were instructed: *"Sometimes in life we find ourselves in situations where the resources available to us are not sufficient and we experience the deep and difficult sensation of scarcity because what we need is beyond our economic means. For example, money may not be enough to live serenely, to cover all necessities, to carry out a project, or to afford something important or deeply desired. We ask you to take a moment to close your eyes and remember as vividly as possible one or more episodes in your life when you perceived that the money or resources available to you or your family were not sufficient. These could be brief or prolonged situations, situations where expenses exceeded economic possibilities, moments when you had to give up something important, or experiences where you felt you did not have enough to satisfy an essential need or deep desire. What matters is that you can remember what it was like for you to live that sensation of scarcity or lack of resources. Please describe below the episode or episodes that came to mind, explaining what happened and how you felt. If this has never happened to you, try to imagine it."* Second, participants were asked to close their eyes again and recall the same episode(s), then to *"list below the five things that you most desired at that moment or moments and could not have, explaining how you felt and what influence this had on you."* Third, participants were instructed once more to recall the episode(s) and to *"write below whether you fear that a similar situation could occur again and how you would feel."*

Participants in the non-scarcity condition completed a parallel three-step procedure focused on a neutral topic. First, they were instructed: *"There are many different ways to spend*

one's weekend. We ask you to take a moment to close your eyes and think back to your typical weekend. How do you spend it? What activities do you engage in? Please try to tell us below about your typical weekend." Second, they were asked to "take another moment to close your eyes and think about the five places where you usually spend the most time during your weekends. Please list them below and try to describe where they are and what they are like." Third, participants were instructed to "take another moment to close your eyes and think about your weekends. Which activity, among those you mentioned, do you prefer? Why? Please report it below and try to describe why you like it so much."

After completing the experimental task, participants reported their responses on the main study measures. Interpersonal objectification was assessed as in Studies 4 and 5a using a composite index ($\alpha=.78$) that combined the *Relations Objectification Scale* (Lachowicz-Tabaczek et al., 2021) and the *Objectification Scale* (Belmi & Schroeder, 2021). Given the multiplicity and heterogeneity of ToM measures, a different performance-based assessment of ToM was employed in the present study. While Study 5a used the *Yoni Task* (Isernia et al., 2024), the current experiment measured ToM through the *Reading the Mind in the Eyes Test* (Baron-Cohen, 2001; see Chapter 2). In addition, reflecting on the findings from Study 5a, particularly the possibility that the manipulation did not affect the dependent variables because the relationship identified in Study 4 may be chronic or cumulative in nature, Study 5b also included a measure of baseline scarcity perceptions, the *Psychological Inventory of Financial Scarcity* (Van Dijk et al., 2022; $\alpha = .89$), previously employed in Study 4. This measure served to explore whether pre-existing scarcity perceptions might moderate or interact with the experimental manipulation in shaping objectification and ToM outcomes.

As in Study 5a, a set of manipulation checks assessed perceived scarcity, pressure, frustration, and well-being. At the end of the survey, participants completed socio-demographic

questions (age, gender, nationality, education, and income), after which they were fully debriefed and thanked for their participation.

Results

As in Study 5a, a MANOVA was conducted to examine the effects of the experimental manipulation, with condition (scarcity vs. no-scarcity) as a fixed factor and including both the manipulation check variables and the dependent variables: interpersonal objectification and ToM performance (see Table 3.3).

Table 3.4.
MANOVA results (Recall task)

	<i>F</i>	<i>p</i>	Partial η^2	No-scarcity condition		Scarcity condition	
				<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Manipulation checks							
Perception of scarcity	13.18	< .001	.028	3.08	1.68	3.67	1.78
Scarcity pressure	27.71	< .001	.056	3.17	1.84	4.06	1.82
Frustration	75.68	< .001	.140	2.62	1.58	4.07	1.99
Well-being	48.78	< .001	.095	4.90	1.36	3.91	1.68
Dependent variables							
Interpersonal objectification	1.01	.316	.002	2.40	.66	2.46	.66
ToM	6.71	.010	.014	14.87	2.60	15.45	2.13

The results largely replicate those of Study 5a, as the condition again had a significant effect ($\lambda = .82$, $F(6,458) = 16.58$, $p < .001$, $\eta^2 = .178$) but only on the manipulation checks, as it did not influence interpersonal objectification, consequently failing to support *H_{p1}*. Unlike Study 5a, the manipulation in the present study did affect ToM performance, albeit in the opposite direction to that predicted (*H_{p2}*): participants in the scarcity condition demonstrated significantly better ToM performance compared to those in the no-scarcity condition. This divergent outcome likely reflects the reflective nature of the recall task: participants instructed to describe their thoughts and feelings during periods of hardship may have experienced

heightened sensitivity to mental and emotional states, temporarily enhancing performance on the *Reading the Mind in the Eyes Test*, which directly assesses such sensitivity. Given this result's divergence from theoretical predictions, its likely methodological origin, and absence of replication in other studies, it was not interpreted as theoretically meaningful regarding scarcity's effects on ToM. Consequently, the hypothesized partial mediation (*Hp3*) could not be tested. Nevertheless, correlational analyses again revealed a significant negative association between ToM performance and interpersonal objectification, $r = -.134, p < .01$, consistent with the pattern observed across the previous studies.

As already suggested in Study 5a, the null effects on interpersonal objectification across both Studies 5a and 5b indicate that scarcity may function primarily as a chronic condition, becoming psychologically consequential through repeated or extended exposure rather than brief experimental inductions. This interpretation aligns with evidence showing online scarcity manipulations often fail to produce robust effects, likely because they do not induce sufficiently salient or ecologically valid changes in perceived life circumstances (Haushofer & Salicath, 2024).

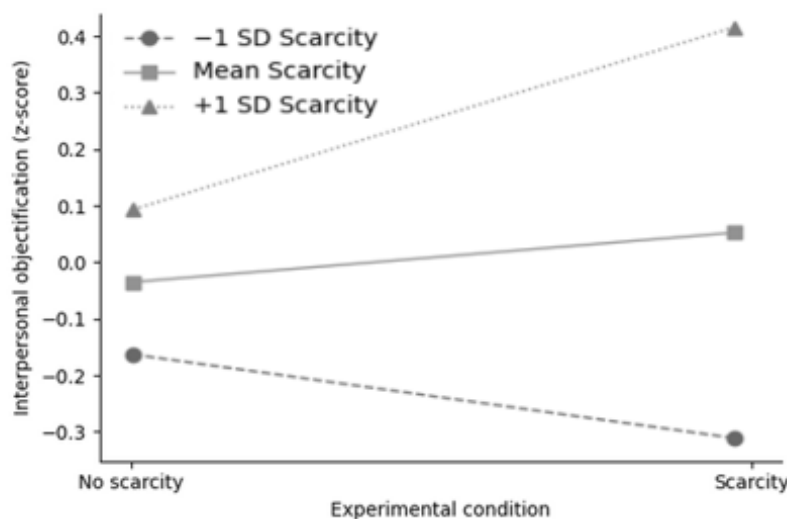
In light of this possibility, an exploratory moderation analysis was performed to test whether the effect of the experimental condition (0 = no scarcity, 1 = scarcity) on interpersonal objectification varied as a function of participants' baseline levels of scarcity in their everyday lives. The underlying hypothesis was that the manipulation would exert minimal influence on individuals who do not normally experience scarcity, while showing a stronger effect among those for whom scarcity is already a psychologically salient condition.

Results supported this interpretation. The moderation model (PROCESS Model 1; Hayes, 2018) was statistically significant, $F(3, 461) = 12.29, p < .001$, explaining approximately 7.4% of the variance in interpersonal objectification ($R^2 = .074$). Neither the intercept nor the main effect of the experimental manipulation reached significance, $b = -0.043, p = .491$, and b

$= 0.086$, $p = .336$, respectively. Baseline scarcity positively predicted interpersonal objectification, $b = 0.127$, $p = .045$, 95% CI [0.003, 0.250]. Crucially, the interaction between experimental condition and scarcity was significant, $b = 0.233$, $p = .010$, 95% CI [0.056, 0.409], indicating that the impact of the manipulation depended on participants' chronic experience of scarcity (see Figure 3.2). Simple slopes analyses clarified the nature of this interaction. At low (-1 SD) levels of baseline scarcity, the effect of the experimental manipulation on interpersonal objectification was not significant, $b = -0.146$, $p = .249$. Similarly, no significant effect emerged at mean levels of scarcity, $b = 0.086$, $p = .336$. In contrast, at high ($+1$ SD) levels of baseline scarcity, exposure to the scarcity condition was associated with a significant increase in interpersonal objectification, $b = 0.319$, $p = .012$, 95% CI [0.070, 0.568].

Figure 3.2.

Simple slopes of the effect of experimental scarcity on interpersonal objectification at low, mean, and high levels of baseline scarcity



Note. Experimental condition was coded as 0 = no scarcity and 1 = scarcity. Baseline scarcity was z-standardized. Simple slopes are plotted at -1 SD, the mean, and $+1$ SD of baseline scarcity.

Taken together, Studies 5a and 5b reveal that brief experimental manipulations, particularly in online settings, are insufficient to capture scarcity's psychological impact on

objectification and ToM. The successful manipulation checks confirm participants experienced subjective scarcity, yet this did not translate into predicted effects on objectification. The moderation analysis in Study 5b provides crucial insight: the manipulation increased objectification only among participants already experiencing high baseline scarcity, suggesting scarcity exerts influence primarily when it becomes a stable component of lived experience rather than a transient, experimentally induced state. These findings underscore the need to examine how real-world scarcity contexts shape objectification, which subsequent studies address through more ecologically valid approaches.

3.9 – Study 6: When Scarcity Feels Real. A naturalistic test of its effects on interpersonal objectification and Theory of Mind

Given the necessity of studying scarcity and its effects in a manner that more closely approximates real-world conditions, Study 6 aimed to replicate Studies 5a and 5b while modifying the experimental manipulation to enhance its realism and thereby examine the impact of a concrete scarcity threat on participants' tendency to objectify others, as well as on ToM performance. To this end, the study drew inspiration from an actual event: the blackout that struck the Iberian Peninsula on April 28, 2025, a massive and sudden disruption of electrical supply that affected Spain and adjacent areas, impacting approximately 60 million people. This blackout had pervasive consequences for daily life: transportation systems were paralyzed, communications and internet connections were severed, and numerous critical infrastructures, such as hospitals or banking facilities experienced significant interruptions. The event generated a genuine temporary scarcity of fundamental resources—not merely material goods, but also access to information and essential services—creating conditions of widespread stress, emotional pressure, and frustration. For many individuals, this blackout constituted an experience of confronting suddenly limited and unpredictable resources, inducing a concrete

perception of vulnerability and scarcity. The sudden and total nature of the blackout, combined with its duration of several hours and the impossibility of immediate planning, provided a unique context for investigating how a real scarcity threat might influence social and cognitive processes.

Study 6 was therefore conducted approximately two months after the event, at a point still temporally proximate to the blackout, when individuals' memories and emotions remained vivid and experiences of scarcity were readily accessible. This temporal proximity allowed the experimental manipulation to anchor itself to a real and meaningful event, thereby enhancing the strength of the manipulation relative to previous studies, which had relied on more artificial and brief interventions. The objective was thus to examine whether the activation of a genuinely experienced scarcity threat could increase tendencies to objectify others and influence ToM performance, thereby undermining what constitutes a protective factor against objectification and providing a more realistic account of how scarcity may affect social behavior and cognitive capacities.

Accordingly, Study 6 tested the same three core hypotheses of Study 5a and 5b: first, that participants exposed to scarcity manipulation would exhibit higher levels of interpersonal objectification compared to those in the no-scarcity condition (*Hp 1*). Second, that scarcity manipulation would reduce ToM performance, reflecting the cognitive impairment pathway through which scarcity undermines this protective capacity (*Hp 2*). Third, that the effect of scarcity on interpersonal objectification would be partially mediated by ToM impairment (*Hp 3*).

Method

Participants

As this study constituted a replication of Studies 5a and 5b, with the sole modification being the experimental manipulation, the same sample size was adopted. Participants were

recruited through Prolific, an online platform for participant recruitment. Eligibility criteria included being residents of Spain and having been present in Spain on the day of the blackout. A total of 454 participants were included in the final sample (220 women, 227 men, and 7 who identified as “other”; $M_{\text{age}} = 35.80$ years, age range = 19–76, $SD = 11.63$). With respect to educational attainment, 4.0% had completed compulsory secondary education, 20.3% held a high school diploma or vocational training qualification, 40.1% held a bachelor’s degree, 21.8% held a master’s degree, and 13.9% reported having completed postgraduate studies (master’s or PhD). In terms of income distribution, 7.5% reported earning less than €1,000 per month, 25.3% between €1,000 and €1,800, 27.1% between €1,800 and €2,800, 26.2% between €2,800 and €4,000, 9.9% between €4,000 and €6,000, and 4.0% reported earning more than €6,000 per month.

Procedure and materials

All participants received a link that randomly assigned them to one of three conditions and directed them to the experimental task. The manipulation consisted of three sequential phases, each requiring participants to engage with condition-specific imagery and respond to open-ended prompts.

Participants in the high-scarcity condition completed a three-phase procedure designed to induce vivid perceptions of resource insufficiency. In the first phase, they were instructed: *"We now ask you to close your eyes and imagine that an event similar to the blackout of April 28, 2025, is occurring again across Spain. Imagine that, as on that occasion, electricity and telephone service suddenly disappear. However, unlike April 28, 2025, this new blackout is not resolved within the first twenty-four hours. A couple of days pass, and it is still unclear when it will end. Authorities state that it may be necessary to wait 'a few more days.' All activities remain suspended; ATMs are not functioning, electronic payments are unavailable, and the few shops that remain open accept cash only. Because you did not anticipate such a situation, you*

find yourself completely unprepared. At home, your resources are truly beginning to run out: you have very little cash, no more than 20 euros, and very limited supplies of food, water, and other essential goods that you normally use. Please describe below how you would experience this situation, keeping in mind that your resources (e.g., money, food, water, essential goods, etc.) might not be sufficient to last until the end of the blackout." In the second phase, participants were asked to close their eyes again and continue imagining the prolonged blackout, then to *"indicate which resources whose scarcity or complete depletion in this situation would concern you the most, and explain why."* In the third phase, participants once more closed their eyes and continued the visualization, then were asked to *"describe how you would behave in a situation like this."*

Participants in the low-scarcity condition completed a parallel three-phase procedure with identical scenario framing but contrasting resource availability. In the first phase, they were instructed: *"We now ask you to close your eyes and imagine that an event similar to the blackout of April 28, 2025, is occurring again across Spain. Imagine that, as on that occasion, electricity and telephone service suddenly disappear. However, unlike April 28, 2025, this new blackout is not resolved within the first twenty-four hours. A couple of days pass, and it is still unclear when it will end. Authorities state that it may be necessary to wait 'a few more days.'* All activities remain suspended; ATMs are not functioning, electronic payments are unavailable, and the few shops that remain open accept cash only. Fortunately, although you did not anticipate such a situation, you are sufficiently prepared. At home, you have enough cash and ample supplies of food, water, and other essential goods that you normally use. Please describe below how you would experience this situation, keeping in mind that your resources (e.g., money, food, water, essential goods, etc.) would be more than sufficient to last until the end of the blackout." In the second phase, participants continued imagining the scenario and were asked to *"indicate which resources you would like to have in abundance in this situation,*

and explain why." In the third phase, they were asked to *"describe how you would behave in a situation like this."*

Participants in the control condition completed a three-phase procedure focused on neutral everyday experiences. In the first phase, they were instructed: *"We now ask you to close your eyes and think about your everyday life, and in particular about your usual routine during typical days. Please describe it below."* In the second phase, they were asked to *"take another moment to close your eyes and think about your everyday life, and in particular about your usual routine during typical days. Please indicate below the places where you spend most of your time and describe what they are like."* In the third phase, they were instructed to *"take one more moment to close your eyes and think about your everyday life, and in particular about your usual routine during one of your typical days. Please indicate below the activities you enjoy the most and explain why."*

This manipulation was designed to ensure that participants in the high-scarcity condition experienced vivid imagery of resource insufficiency within a concrete, personally relevant scenario, while those in the low-scarcity condition imagined the same situation with adequate preparation and resources, and those in the control condition engaged with emotionally neutral content unrelated to scarcity or threat, allowing for comparison of objectification tendencies and ToM performance under normal, non-threatening circumstances.

Following the experimental manipulation, participants completed a series of measures. Interpersonal objectification was assessed using a Spanish translation of the composite scale ($\alpha = .89$) combining the *Relations Objectification Scale* (Lachowicz-Tabaczek et al., 2021) and the *Objectification Scale* (Belmi & Schroeder, 2021), already employed in Study 4, 5a and 5b. ToM was measured using Spanish-language version of the *Reading the Mind in the Eyes* (López & Richaud, 2020). The study also incorporated the same manipulation checks specifically developed in Study 4 to evaluate perceived scarcity, scarcity-induced pressure, negative

emotions, and wellbeing. At the conclusion of the survey, participants provided socio-demographic information, including age, gender, nationality, educational attainment, and household income level. Following completion of all measures, participants were fully debriefed and thanked.

Results

To examine the effects of the experimental manipulation, a MANOVA was conducted including the four manipulation checks (perceived scarcity, scarcity-related pressure, frustration, and well-being), interpersonal objectification, and ToM performance as dependent variables. The independent variable was the experimental condition (no scarcity vs. low scarcity vs. high scarcity). The MANOVA revealed a significant multivariate effect of condition on the manipulation checks ($\lambda = .70$, $F(12,892) = 14.23$, $p < .001$, $\eta^2 = .161$), confirming that the experimental manipulation was successful (see Table 3.6).

Table 3.6.
MANOVA results (Black-out scenario). Study 5

		<i>F</i>	<i>p</i>	η^2_p	Control		Low scarcity		High scarcity	
					<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Manipulation checks										
	Perception of scarcity	57.76	< .001	.204	3.31	1.68	4.27	1.80	5.40	1.48
	Scarcity pressure	45.31	< .001	.167	3.28	3.28	3.52	1.76	5.01	1.58
	Negative emotions	30.48	< .001	.119	3.08	1.62	3.90	1.68	4.58	1.62
	Well-being	38.13	< .001	.145	4.77	1.29	3.92	1.63	3.27	1.45
Dependent variables										
	Interpersonal objectification	10.53	< .001	.045	2.57	.85	2.65	.83	3.01	.90
	ToM	1.78	.170	.008	13.92	2.41	13.38	2.73	13.70	2.40

Regarding the key dependent variables, the univariate analyses indicated a significant effect of condition on interpersonal objectification. Consistent with *Hp1*, participants in the high-scarcity condition reported higher levels of objectification than those in the low-scarcity condition and the no-scarcity condition. These results supported *Hp1*, indicating that

experiencing scarcity increases the tendency to objectify others. In contrast, the manipulation did not produce significant differences in ToM performance. Mean ToM scores were comparable across the three conditions. The absence of an effect of scarcity on ToM did not support *Hp2* and therefore did not allow for testing ToM as a mediator of the effect of scarcity on interpersonal objectification (*Hp3*). Nevertheless, correlational analyses once again revealed a statistically significant negative association between ToM performance and interpersonal objectification, $r = -.024$, $p < .001$, consistent with the pattern observed across the previous studies.

Study 6 provides experimental confirmation that scarcity causally promotes interpersonal objectification when experienced as sufficiently realistic and salient. Unlike the brief and relatively abstract manipulations used in Studies 5a and 5b, the blackout scenario grounded in a concrete, recently experienced event proved decisive. This finding experimentally validates the correlational evidence from Study 4: scarcity functions as a contextual factor that increases objectifying tendencies. Participants exposed to the high-scarcity condition reported significantly higher levels of objectification than those in both the low-scarcity and neutral conditions. The absence of such evidence in Studies 5a and 5b likely reflect the fact that the manipulations employed in those studies, while effective in generating subjective experiences of scarcity and pressure, were not sufficiently potent or personally relevant to alter a complex and multifaceted construct such as interpersonal objectification. In contrast, the blackout scenario used in Study 6 was grounded in a recent, collectively experienced event, thereby creating a manipulation that was simultaneously realistic, threatening, and emotionally resonant.

However, consistent with Study 5a, Study 6 found no effect of scarcity on ToM performance despite the manipulation's increased realism. This suggests ToM abilities involved in recognizing others' mental and emotional states are stable and resistant to temporary

contextual pressures. The experimental studies thus far (5a, 5b, 6) examined only experimentally induced scarcity. They did not address whether chronic exposure to scarcity might influence ToM capacity through specific cognitive mechanisms. Study 7 was designed to address these unresolved questions.

3.10 – Study 7: The cognitive pathways from scarcity to interpersonal objectification

Studies 4-6 established that scarcity associates with and causally promotes interpersonal objectification, while ToM consistently shows negative associations with objectification. However, ToM appears unaffected by temporary scarcity manipulations (Studies 5a, 5b, 6), and neither moderation nor mediation by ToM received support in correlational analysis (Study 4). Study 7 was designed to reconcile these findings by examining variables that may better account for the scarcity-objectification relationship while testing whether chronic (vs. temporary) scarcity might relate to ToM differently.

The first factor considered was a key contextual variable: perceived socioeconomic inequality. As discussed in this chapter, scarcity is inherently linked to socioeconomic inequality, as inequality structures the very distribution of resources within a society. Moreover, perceptions of inequality can shape whether individuals experience their own resources as sufficient or deficient. The same objective level of resources may be interpreted as adequate or insufficient depending on the relevant comparison group: upward comparisons to those who are better off may elicit feelings of deprivation, whereas downward comparisons may evoke a sense of relative abundance (Sánchez-Rodríguez et al., 2019). If perceived inequality determines whether people interpret their circumstances as secure or deprived, it is also plausible to imagine that it would be associated with increased perceived scarcity.

In addition to this contextual dimension, Study 7 introduced two individual-level cognitive variables that may contribute to explaining why scarcity increases interpersonal

objectification: attentional tunnelling on money and short-term time orientation. As outlined earlier in this chapter, the rationale behind these variables derives from two complementary assumptions. First, scarcity narrows attentional focus to the resource perceived as lacking; in the case of economic scarcity, attention becomes disproportionately directed toward money. As presented in Chapter 1, increased salience of money is known to promote interpersonal objectification. Second, scarcity encourages decision-making strategies that prioritize immediate benefits over long-term outcomes, which may foster more instrumental views of social relationships. Individuals guided by short-term gains may therefore be more inclined to treat others as means to achieving immediate ends.

Finally, within this framework, Study 7 addressed the critical theoretical question regarding the role of ToM in the scarcity-objectification relationship. As discussed earlier in this chapter, two competing theoretical perspectives suggest different roles for ToM: it may function as a stable individual difference that moderates the impact of contextual factors on objectification, or it may operate as a dynamic cognitive capacity that is itself influenced by social-structural variables such as perceived inequality and scarcity. The previous experimental studies (Studies 5a, 5b, and 6) revealed no significant effect of scarcity manipulations on ToM, suggesting that short-term experimental inductions may be insufficient to affect this capacity. However, chronic exposure to inequality and scarcity, as reflected in individuals' subjective perceptions, may have different effects.

Study 7 adopted a dual analytical strategy to test both theoretical possibilities within a comprehensive mediation framework. ToM was examined both as a moderator that could buffer effects of scarcity and its cognitive consequences on objectification (Model A), and as an additional mediator that might itself be influenced by perceived inequality and scarcity while subsequently affecting objectification (Model B). Accordingly, Study 7 tested the following hypotheses through two complementary analytical models that differed in their

conceptualization of ToM's role. Model A (Figure 3.3) examined ToM as a moderator within a moderated serial mediation framework, testing whether individual differences in ToM capacities attenuate the effects of perceived inequality and scarcity on objectification.

Model B (Figure 3.4) examined ToM as an additional serial mediator, testing whether perceived inequality and scarcity influence ToM capacities, which in turn affects objectification. Despite this critical difference, both models shared a common core structure and tested the same foundational hypotheses regarding the pathways from perceived inequality to objectification through scarcity and its cognitive consequences.

Figure 3.3.

Model A: Moderated serial mediation with ToM as moderator

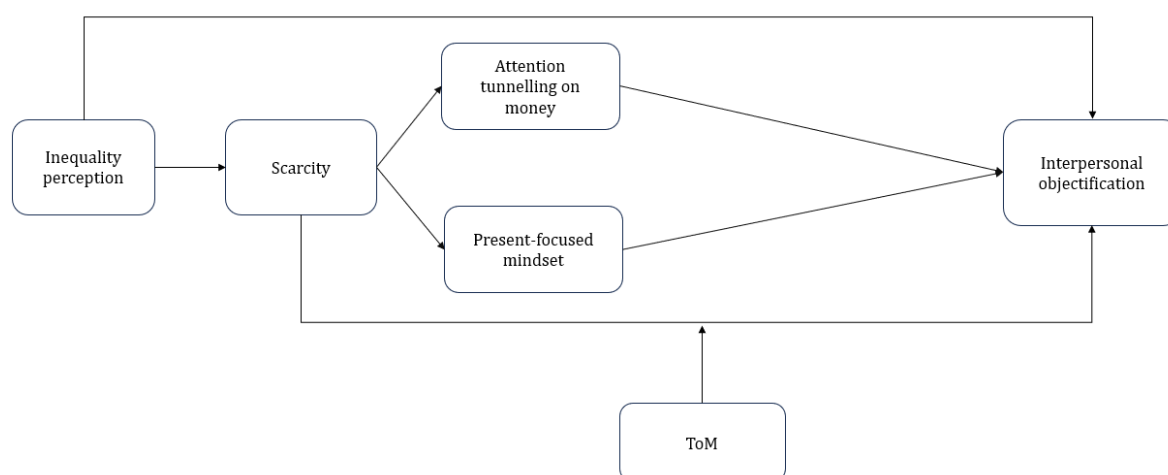
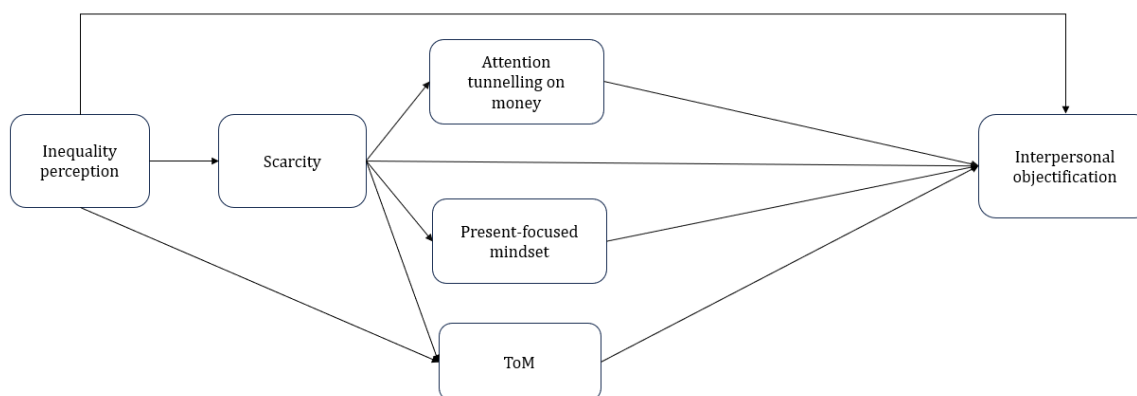


Figure 3.4.

Model B: Serial mediation with ToM as mediator



The shared hypotheses, tested identically in both models, were as follows. First, it was hypothesized that individuals who perceive higher levels of inequality in their environment would also report stronger feelings of scarcity (*Hp1*). In turn, scarcity was expected to influence interpersonal objectification through multiple pathways. A direct effect was predicted, whereby greater scarcity would lead to increased objectification of others, with individuals viewing them more as means to an end than as agents with their own thoughts and feelings (*Hp2*). Beyond this direct pathway, two parallel mediations were hypothesized: first, experiencing scarcity would be associated with higher levels of attentional tunneling on money (*Hp3*), and that this cognitive focus would mediate the relationship between scarcity and interpersonal objectification (*Hp4*). Secondly, it was hypothesized that scarcity would increase this present-focused mindset (*Hp5*), and that this temporal orientation would mediate the effect of scarcity on interpersonal objectification (*Hp6*).

The divergence between the two models concerned the role of ToM, which was formulated as two alternative hypotheses (*Hp7*). In Model A's moderated mediation framework (*Hp7a*), it was hypothesized that higher ToM capacities would attenuate the relationships between perceived inequality, scarcity, and their cognitive consequences on interpersonal objectification, thereby functioning as a protective individual difference that buffers against contextual risk factors. In Model B's serial mediation framework (*Hp7b*), it was alternatively hypothesized that perceived inequality and scarcity would themselves influence ToM—potentially enhancing mentalizing capacity through increased need for social vigilance, or depleting it through scarcity-induced cognitive load—and that ToM would in turn predict interpersonal objectification. In this second framework, ToM functions as a dynamic mediating process within the causal chain rather than as a stable moderator of existing pathways.

Method

Participants

The sample size was determined through a Monte Carlo power analysis for mediation models with five mediators (Schoemann et al., 2017). Conservative effect sizes and simulation parameters were selected to ensure robust power estimates ($r = 0.04$, $1-\beta = 0.80$, 5,000 replications, 20,000 draws, 95% Monte Carlo confidence level). The analysis indicated that a minimum sample size of 347 participants was required to achieve a statistical power of 0.81 (95% CI = 0.80, 0.82). A total of 529 participants were initially recruited through a snowball sampling procedure. From this pool, 138 participants were excluded due to incomplete responses (i.e., failure to complete one or more scales), and 6 for inaccurate responses to the two attentional check items. The final sample consisted of 385 participants (251 women, 129 men, 2 who identified as “other,” and 3 who preferred not to respond; $M_{age} = 36.28$ years, age range = 18–87, $SD = 16.13$). All participants were Italian. Regarding educational attainment, 5.5% had completed middle school, 47.5% held a high school diploma, 17.1% held a bachelor’s degree, 21.3% held a master’s degree, and 8.6% reported a postgraduate qualification (i.e., master’s specialization or PhD). In terms of annual income, 8.1% reported earning less than €10,000, 26.8% between €10,000 and €25,000, 38.7% between €25,000 and €50,000, 18.7% between €50,000 and €75,000, 3.6% between €75,000 and €100,000, and 4.2% reported earning more than €100,000 per year.

Procedure and materials

All participants completed an online survey that included the measures described below, which were presented in random order.

Scarcity was assessed using the *Psychological Inventory of Financial Scarcity* (Van Dijk et al., 2022; $\alpha = .87$), previously employed in Study 4 and 5b. Interpersonal objectification was assessed as in Studies 4, 5a, 5b and 6 using a composite index ($\alpha = .85$) that combined the *Relations Objectification Scale* (Lachowicz-Tabaczek et al., 2021) and the *Objectification Scale* (Belmi & Schroeder, 2021). ToM was measured with the *Theory of Mind Inventory* (Hutchins

et al., 2020; $\alpha = .91$), already employed in the first part of the present research (see Chapter 2) and in Study 4. Perceived inequality was assessed using an Italian translation of the *Perception of Economic Inequality in Everyday Life* (PEIEL) scale (García-Castro et al., 2018): participants indicated their agreement with 12 items on a 7-point scale (1 = “*strongly disagree*”; 7 = “*strongly agree*”) assessing perceptions of economic disparities in their social environment ($\alpha = .89$; e.g. “Among the people I surround myself with, there are some people who can afford access to a better health service than others”; “Among the people I surround myself with, there are some people who can afford access to a better education than others”). Attention tunneling on money was measured using an adapted version of the paradigm developed by Shah et al. (2018; $\alpha = .75$) to capture the salience of cost-related thoughts in everyday situations. Participants read four scenarios involving common experiences with an implicit economic dimension (e.g., buying wine for a friend’s birthday, treating a friend to lunch, taking an unexpected cab ride, drinking a beer at home). For each scenario, they rated on a 10-point Likert scale (1 = “I wouldn’t think about it at all,” 10 = “I would think about it a lot”) the extent to which they would think about several aspects of the experience. Each scenario included one cost-related item (e.g., “How much will I need to chip in for the wine?”) and multiple non-cost-related items (e.g., “What kind of wine will they order?”). Ratings for cost-related items were averaged across scenarios to create a composite index of monetary salience. Present-focused mindset was assessed using an Italian translated version of the *Consideration of Future Consequences Scale* (Strathman et al., 1994). This 12-item self-report instrument measures the extent to which individuals consider distant versus immediate consequences of their current behavior. Participants rated each statement on a 7-point Likert scale (1 = “*extremely uncharacteristic*,” 7 = “*extremely characteristic*”), with higher scores indicating a more present-focused mindset ($\alpha = .76$; e.g. “I only act to satisfy immediate concerns, figuring the future will take care of itself”; “I think that sacrificing now is usually unnecessary since future

outcomes can be dealt with at a later time”). At the end of the survey, participants responded to a set of socio-demographic questions (age, gender, nationality, education, and income) and were then debriefed and thanked.

Results

Table 3.7 reports correlations among variables. Perceived inequality showed a small positive association with scarcity, consistent with *Hp1*.

Table 3.7.
Correlation Matrix for Study 7 variables

	M	SD	1	2	3	4	5
1 Perceived_inequality	5.12	0.95	—				
2 Scarcity	2.98	1.01	0.149**	—			
3 Attention tunneling on money	3.64	1.16	0.241***	0.261***	—		
4 Present-focused mindset	3.10	0.75	-0.075	0.249***	-0.002	—	
5 ToM	5.28	0.64	0.260***	-0.071	0.092	-0.107*	—
6 Interpersonal objectification	2.00	0.62	-0.064	0.175***	0.207***	0.307***	-0.277***

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

Perceived inequality was also moderately and positively associated with attentional tunneling on money and with ToM, suggesting that individuals who perceive greater inequality report both heightened scarcity-related cognitions and somewhat higher mentalizing capacities. No meaningful association emerged between perceived inequality and interpersonal objectification. Scarcity displayed a medium association with attentional tunneling on money and with present-focused mindset, supporting *Hp3* and *Hp5*. Scarcity also showed a small-to-medium positive association with interpersonal objectification, consistent with *Hp2*. As expected based on Studies 5a–6, scarcity was not significantly related to ToM. Attentional

tunneling on money was positively correlated with interpersonal objectification, a medium effect that aligns with *Hp4* and with the theorized role of resource-focused cognition in fostering instrumental social perception. A present-focused mindset exhibited a large positive association with interpersonal objectification, consistent with *Hp6* and indicating that individuals oriented toward immediate gains tend to view others more instrumentally. Present focus was also weakly negatively associated with ToM, reflecting a small effect. Finally, ToM showed a medium-to-large negative association with interpersonal objectification, replicating findings from Study 4 and providing a foundational rationale for the dual conceptualization tested in the present study.

Taken together, the correlational pattern supports the core assumptions of the theoretical framework guiding Study 7: higher perceived inequality is linked with higher perceived scarcity; scarcity is linked to cognitive processes (resource-focused attention and short-term temporal orientation) that, in turn, show meaningful associations with interpersonal objectification. ToM emerges as a robust negative correlate of interpersonal objectification.

To examine the mechanisms through which perceived inequality influences interpersonal objectification, two analytical approaches were implemented using PROCESS macro (Hayes, 2018): Model A, which tested ToM as a moderator of direct and indirect pathways (see Figure 3.3), and Model B, which examined ToM as an additional serial mediator (see Figure 3.4). Both models included perceived inequality as the independent variable, scarcity as the first mediator, attentional tunneling on money and present-focused mindset as parallel second mediators, and interpersonal objectification as the dependent variable. All continuous variables were standardized prior to analysis.

Model A: ToM as Moderator

Direct Effects and Mediation Pathways. The moderated serial mediation model (PROCESS Model 89) explained 22.72% of the variance in interpersonal objectification, $F(9, 375) = 12.25, p < .001$. As hypothesized, perceived inequality significantly predicted scarcity,

supporting *Hp1* (see Table 3.5). However, the direct effect of scarcity on objectification was not significant, suggesting scarcity's influence operates entirely through cognitive mechanisms rather than directly.

Table 3.5
Direct and Indirect Effects for Model A

Path	β	SE	95% CI	z	p
Direct effects					
Perceived inequality → Scarcity	.149	.051	[.049, .248]	2.944	.003
Scarcity → Attention tunneling on money	.230	.049	[.134, .326]	4.714	< .001
Scarcity → Present-focused mindset	.278	.051	[.177, .378]	5.426	< .001
Attention tunneling on money → Interpersonal objectification	.239	.049	[.143, .335]	4.900	< .001
Present-focused mindset → Interpersonal objectification	.274	.048	[.181, .368]	5.762	< .001
ToM → Interpersonal objectification	-.272	.049	[-.367, -.177]	-5.607	< .001
Scarcity → Interpersonal objectification	.039	.050	[-.059, .137]	0.783	.434
Perceived inequality → Interpersonal objectification	-.044	.049	[-.140, .053]	-0.892	.373
Perceived inequality × ToM → Interpersonal objectification	.102	.047	[.010, .194]	2.175	.030
Scarcity × ToM → Interpersonal objectification	-.013	.047	[-.105, .078]	-0.283	.777
Conditional effects of Perceived inequality on Interpersonal objectification at levels of ToM					
Low ToM (-1 SD)	-.145	.068	[-.279, -.012]	-2.139	.033
Mean ToM (0)	-.044	.049	[-.140, .053]	-0.892	.373
High ToM (+1 SD)	.058	.067	[-.074, .190]	0.862	.390
Indirect effects at mean level of ToM					
Perceived inequality → Attention tunneling → Interpersonal objectification	.049	.018	[.015, .086]	2.758	.006
Perceived inequality → Present-focused mindset → Interpersonal objectification	-.029	.016	[-.063, -.001]	-1.756	.079
Perceived inequality → Scarcity → Interpersonal objectification	.006	.009	[-.011, .027]	0.624	.533
Perceived inequality → Scarcity → Attention tunneling on money → Interpersonal objectification	.008	.004	[.002, .017]	2.230	.026
Perceived inequality → Scarcity → Present-focused mindset → Interpersonal objectification	.011	.005	[.003, .023]	2.389	.017
Conditional indirect effects at levels of ToM					
<i>Via Scarcity → Attention tunneling on money</i>					
Low ToM (-1 SD)	.010	.006	[.001, .024]	1.610	.107
Mean ToM (0)	.008	.004	[.002, .017]	2.230	.026
High ToM (+1 SD)	.007	.004	[.000, .016]	1.735	.083
<i>Via Scarcity → Present-focused mindset</i>					
Low ToM (-1 SD)	.014	.006	[.004, .028]	2.218	.027
Mean ToM (0)	.011	.005	[.003, .023]	2.389	.017
High Theory of Mind (+1 SD)	.009	.005	[.002, .022]	1.976	.048
Total effects					
Total effect of Scarcity on Interpersonal objectification	0.118	0.052	[0.014, 0.218]	2.269	.023
Total indirect effect of Perceived inequality (at mean ToM)	.046	.021	[.007, .090]	2.201	.028
Total effect of Perceived inequality on Interpersonal objectification	.002	.049	[-.094, .098]	0.041	.968

Consistent with *Hp3* and *Hp4*, scarcity was positively associated with attentional tunnelling on money, which in turn was positively linked with objectification. Similarly, supporting *Hp 5* and *Hp 6*, scarcity was significantly associated with an increased present-focused mindset, which in turn was linked with increased objectification.

Indirect Effects. Bootstrap analyses with 5,000 samples revealed several significant indirect pathways from perceived inequality to objectification. The pathway through attentional tunnelling on money was significant at mean levels of ToM. The serial mediation through scarcity and attentional tunnelling on money was also significant. Additionally, the serial pathway through scarcity and present-focused mindset was significant.

Total effects. The total effect of scarcity (combining direct and all indirect pathways) was significant, $\beta = .118$, $p = .023$, indicating total mediation through attentional tunneling on money and present-focused mindset. The total indirect effect of perceived inequality on objectification was also significant, while the total direct effect was not significant, indicating that perceived inequality's effects operate entirely through the mediated pathways.

Moderation by ToM. Regarding *Hp7*, contrary to the hypothesis that ToM would buffer scarcity's effects, the interactions between ToM and scarcity in predicting objectification was non-significant, thus not supporting the moderation hypothesis: ToM did not attenuate the cognitive pathways through which scarcity promotes objectification. Unexpectedly, ToM moderated the direct relationship between perceived inequality and objectification. Conditional effects analysis revealed that at low levels of ToM, perceived inequality was associated with decreased objectification. This effect became non-significant at mean levels and remained non-significant at high levels of ToM.

Model B: Theory of Mind as Serial Mediator

Direct Effects and Extended Mediation Model. An alternative analytical approach examined ToM as an additional serial mediator rather than a moderator (PROCESS Model 81;

see Table 3.6). This model explained 21.03% of the variance in interpersonal objectification, $F(5, 379) = 20.18, p < .001$, with a total effect of perceived inequality on objectification that was not significant.

Table 3.6.
Direct and Indirect Effects for Model B

Path	β	SE	95% CI	z	p
Direct effects					
Perceived inequality → Scarcity	.149	.051	[.049, .248]	2.944	.003
Scarcity → Attention tunneling on money	.230	.049	[.134, .326]	4.714	< .001
Scarcity → Present-focused mindset	.267	.050	[.169, .364]	5.355	< .001
Perceived inequality → ToM	.277	.050	[.179, .374]	5.570	< .001
Scarcity → ToM	-.112	.050	[-.210, -.014]	-2.256	.025
Attention tunneling on money → Interpersonal objectification	.231	.049	[.136, .327]	4.769	< .001
Present-focused mindset → Interpersonal objectification	.269	.048	[.175, .362]	5.646	< .001
ToM → Interpersonal objectification	-.257	.048	[-.351, -.163]	-5.387	< .001
Scarcity → Interpersonal objectification	.035	.050	[-.063, .132]	0.700	.485
Perceived inequality → Interpersonal objectification	-.038	.049	[-.135, .059]	-0.775	.439
Indirect effects					
Perceived inequality → Attention tunneling on money → Interpersonal objectification	.048	.019	[.016, .089]	2.572	.010
Perceived inequality → Present-focused mindset → Interpersonal objectification	-.031	.016	[-.066, -.003]	-1.898	.058
Perceived inequality → ToM → Interpersonal objectification	-.071	.023	[-.122, -.032]	-3.135	.002
Perceived inequality → Scarcity → Interpersonal objectification	.005	.009	[-.011, .027]	0.598	.550
Perceived inequality → Scarcity → Attention tunneling on money → Interpersonal objectification	.008	.004	[.002, .017]	2.247	.025
Perceived inequality → Scarcity → Present-focused mindset → Interpersonal objectification	.011	.005	[.003, .021]	2.371	.018
Perceived inequality → Scarcity → ToM → Interpersonal objectification	.004	.003	[.000, .010]	1.545	.122
Scarcity → Attention tunneling on money → Interpersonal objectification	.053	.018	[.022, .092]	2.970	.003
Scarcity → Present-focused mindset → Interpersonal objectification	.072	.020	[.036, .115]	3.574	< .001
Scarcity → ToM → Interpersonal objectification	.029	.015	[.003, .062]	1.919	.055
Total effects					
Total indirect effect of Scarcity	.154	.033	[.093, .223]	4.636	< .001
Total effect of Scarcity on Interpersonal objectification	.189	.054	[.084, .294]	3.529	< .001
Total indirect effect of Perceived inequality	.044	.029	[-.009, .104]	1.516	.130
Total effect of Perceived inequality on Interpersonal objectification	.006	.050	[-.092, .104]	0.121	.904

Consistent with Model A, perceived inequality was positively associated with scarcity, supporting *Hp1*. As in Model A, the direct effect of scarcity on objectification was not significant, confirming that scarcity's influence operates through cognitive mechanisms.

Consistent with *Hp3* and *Hp5*, scarcity was significantly and positively associated with both attentional tunneling on money and present-focused mindset. Both cognitive mediators were significantly positively linked to objectification, supporting *Hp4* and *Hp6*.

Theory of Mind as Outcome and Predictor. Critically, this model revealed novel patterns regarding ToM that extend beyond the original hypotheses. Perceived inequality was significantly associated with ToM, suggesting that perceiving greater inequality is linked to enhanced ToM. However, at the same time scarcity showed a significant negative effect on ToM, indicating that experiencing scarcity is associated with reduced ToM capacity. In the final model, ToM emerged as a significant negative correlate of objectification with one of the strongest direct effects in the model. This strong negative association indicates that higher ToM is linked to substantially lower objectification tendencies. Furthermore, the significant indirect pathway from perceived inequality through ToM to objectification supports *Hp7b*, confirming that ToM functions as a dynamic mediator: perceived inequality is associated with higher ToM, which in turn is associated with lower objectification.

Indirect Effects Through Theory of Mind. Bootstrap analyses revealed multiple significant indirect pathways. The pathway through attentional tunneling on money remained the strongest positive indirect association, consistent with the mediation pattern hypothesized in *Hp4*. The serial pathways involving scarcity and attentional tunneling on money, and involving scarcity and present-focused mindset, were both significant, further supporting the hypothesized mediation chains (*Hp4* and *Hp6*). However, the pathway through ToM showed a significant negative indirect effect, indicating that perceived inequality's association with higher ToM was subsequently linked to lower objectification, a pattern consistent with *Hp 7b*. Notably, a paradoxical pathway emerged involving scarcity and ToM: perceived inequality was associated with higher scarcity, which was associated with lower ToM, which in turn was associated with higher objectification. This marginally significant pathway reveals a potential

cognitive cost of scarcity on ToM. The pathway through present-focused mindset alone again showed a marginally significant negative effect, replicating the suppression pattern observed in Model A.

Total Effects. The total effect of scarcity on objectification (combining direct and all indirect pathways) was significant and positive, indicating that scarcity's overall association with objectification remained positive despite the pathway through ToM. This total effect was larger in Model B than in Model A, reflecting the additional indirect pathways that include ToM as a mediator. The total indirect effect of scarcity was also significant, suggesting substantial mediation through attentional tunneling on money and present-focused mindset. In contrast, neither the total indirect effect nor the total effect of perceived inequality on objectification reached significance, reflecting the presence of competing positive and negative pathways that offset each other.

Contrasts Between Indirect Effects. Pairwise contrasts between indirect effects revealed significant differences in pathway strength. The contrast between the attentional tunneling on money pathway and the ToM pathway was significant and substantial, indicating that the positive effect through cognitive tunneling on money significantly exceeded the negative protective effect through ToM. Similarly, the ToM pathway was significantly more negative than all scarcity-mediated pathways, confirming that ToM represented the strongest mediator in the relationship among perceived inequality, scarcity and objectification. However, these contrasts also reveal that ToM's protective influence was ultimately outweighed by the combined positive effects of the cognitive pathways (attentional tunneling on money and present-focused mindset) that promote objectification. This pattern underscores a fundamental tension: while perceiving inequality is associated with higher ToM, the scarcity associated with it co-occurs with cognitive mechanisms linked to objectification and with lower mentalizing resources that could inhibit it.

Both models converged on several key findings: a) perceived inequality consistently associated with scarcity; b) scarcity reliably associated with both attentional tunnelling on money and present-focused mindset; c) both cognitive mediators significantly and positively associated with interpersonal objectification. The direct associations between perceived inequality and objectification, and between scarcity and objectification (when controlling for mediators), were consistently non-significant in both models, indicating these relationships operate entirely through cognitive mechanisms. The serial mediation pathways from perceived inequality through scarcity to cognitive mediators, and subsequently to objectification, were significant in both models.

On the other hand, the two models revealed divergent yet complementary perspectives on ToM's function. In Model A, ToM did not act as a moderator. In contrast, Model B, where ToM functioned as a serial mediator, revealed a more dynamic and nuanced role. Here, ToM emerged as both reinforced from inequality perception and a strong inhibitor of objectification. This model demonstrated that perceiving inequality is associated with higher ToM, potentially reflecting greater sensitivity toward and a sense of unity with others in similar circumstances, which subsequently reduces objectification tendencies. However, this protective pathway was partially undermined by scarcity's negative effect on ToM, revealing a cognitive cost: scarcity depletes the mental resources necessary for ToM, thereby indirectly facilitating objectification through ToM degradation. The significant indirect effect through the ToM pathway was the largest negative pathway in the model, yet it was outweighed by the combined positive effects through attentional tunneling on money and present-focused mindset.

Overall, findings suggest that perceived inequality sets in motion two competing forces: a direct enhancement of ToM that inhibits objectification, and an indirect degradation of this capacity through scarcity-induced cognitive load. Simultaneously, scarcity activates cognitive

mechanisms (tunnelling, temporal shortsightedness) that promote objectification. The net effect on objectification thus depends on the relative strength of these competing mechanisms.

3.11 – Discussion of the results from Studies 4, 5a, 5b, 6 and 7

The studies of the second part of the research project provided converging evidence for the relationship between scarcity and interpersonal objectification, while revealing the cognitive mechanisms through which this relationship operates and exploring the potential protective role of ToM. Across correlational analyses (Studies 4 and 7) and experimental manipulations (Studies 5a, 5b, and 6), a consistent pattern emerged: scarcity constitutes a psychological and contextual factor that may promote interpersonal objectification, though the strength and manifestation of this effect depend critically on the nature, duration, and strength of the scarcity experience.

Study 4 established foundational correlational evidence demonstrating that scarcity showed a positive association with interpersonal objectification, while ToM exhibited a robust negative relationship with objectification. Consistent with findings from the first part of this research project (see Chapter 2), this pattern identified both a potential risk factor (scarcity) and a protective factor (ToM) warranting experimental investigation. However, neither the moderation nor the mediation analyses yielded significant results. ToM did not buffer against scarcity's objectifying effects, nor did scarcity appear to undermine ToM functioning. The absence of both moderating and mediating effects in this cross-sectional design highlighted a critical methodological consideration: correlational data may lack the sensitivity to detect dynamic processes through which scarcity influences ToM and objectification, particularly if these effects unfold through temporal mechanisms or require experimental manipulation to become apparent.

The subsequent experimental studies sought to establish causal evidence for scarcity's impact on objectification while testing whether scarcity might impair ToM functioning. Studies 5a and 5b employed two different scarcity manipulations (the *Stage games paradigm* and a recall task) both of which successfully induced subjective experiences of scarcity, as confirmed by significant effects on manipulation check variables. However, neither manipulation affected interpersonal objectification, suggesting that temporary scarcity experiences alone are insufficient to alter this complex social-cognitive construct. Crucially, an exploratory moderation analysis in Study 5b revealed a theoretically important pattern: the manipulation increased objectification only among participants who already experienced relatively high levels of chronic scarcity in their everyday lives. This suggests that scarcity's effects on social perception may require chronic or cumulative exposure rather than emerging in response to brief, isolated experimental inductions, particularly in online settings where manipulations may lack sufficient salience or ecological validity (Haushofer & Salicath, 2024).

Regarding ToM, Study 5a found no effect of scarcity manipulation on performance, consistent with the hypothesis that this ability is relatively resistant to short-term experimental inductions, a pattern that converged with results from Studies 2a and 2b in the first part of this research project. Study 5b revealed an unexpected improvement in ToM under scarcity, likely reflecting the reflective nature of the recall task: participants instructed to describe their thoughts and emotions during periods of hardship may have experienced temporarily heightened sensitivity to mental states, enhancing performance on the *Reading the Mind in the Eyes Test*. Given this result's divergence from theoretical predictions, its likely methodological origin, and absence of replication across other studies, it was not interpreted as theoretically meaningful regarding scarcity's effects on ToM.

Study 6 addressed the limitations of Studies 5a and 5b by employing a more realistic manipulation anchored to a concrete event that participants had recently experienced: the April

2025 blackout that affected the Iberian Peninsula. This methodological shift proved decisive. Unlike the brief and relatively abstract manipulations used previously, the blackout scenario provided a sufficiently realistic, threatening, and emotionally resonant scarcity threat, one grounded in a collectively experienced event that remained vivid in participants' memory. Under these conditions, the predicted effect emerged clearly: participants exposed to the high-scarcity condition reported significantly higher levels of objectification than those in both the low-scarcity and neutral conditions, providing experimental confirmation of the correlational evidence from Study 4. However, consistent with Study 5a, Study 6 found no effect of scarcity on ToM performance despite the increased realism, further confirming that ToM abilities are stable and resistant to temporary experimental inductions. This pattern—scarcity affecting objectification but not ToM in experimental contexts—left open the possibility that chronic exposure to scarcity might exert different effects on ToM. Study 7 was designed to address this critical question while simultaneously unpacking the cognitive mechanisms linking scarcity to objectification.

Study 7 provided robust correlational support for the hypothesized cognitive pathways. Building on psychosocial literature linking inequality and scarcity, this study introduced perceived inequality as an antecedent variable to capture the social-structural conditions that generate experiences of scarcity in real-world contexts. The study examined a comprehensive set of variables: perceived inequality as the initial predictor, scarcity as a proximal consequence, two cognitive mechanisms (attentional tunneling on money and present-focused mindset) as consequences of scarcity, ToM as both a potential moderator and mediator, and interpersonal objectification as the ultimate outcome. To examine these complex relationships, two complementary analytical models were tested. Model A employed a moderated serial mediation framework, testing whether ToM functions as a stable protective individual difference that buffers against contextual risk factors. Model B treated ToM as a dynamic mediator within the

causal chain itself, testing whether perceived inequality and scarcity themselves influence ToM capacities, which in turn affect objectification.

Both models confirmed that perceived inequality was positively associated with scarcity, which in turn showed associations with increased attentional tunneling on money and a more present-focused mindset. Both cognitive consequences of scarcity showed substantial positive associations with interpersonal objectification, consistent with theoretical predictions that scarcity creates a cognitive context conducive to instrumental social perception. These findings support the theoretical framework: scarcity is associated with narrowed attentional focus on resource-related concerns, which co-occurs with market-pricing mindsets that promote cost-benefit evaluation of relationships and short-term thinking that prioritizes immediate utility.

However, the two models revealed divergent yet complementary perspectives on ToM's function. Model A revealed no evidence for ToM's moderating role: ToM did not buffer against the associations between scarcity's cognitive mechanisms and objectification, though it unexpectedly moderated the direct relationship between perceived inequality and objectification. In contrast, Model B, which examined ToM as a serial mediator, provided a more nuanced and theoretically rich account, revealing several novel patterns. First, perceived inequality was positively associated with ToM, suggesting that perceiving greater disparities is linked to heightened sensitivity to others' mental states—potentially an adaptive response for navigating complex social hierarchies (Muscatell et al., 2012). Second, and critically, scarcity showed a significant negative association with ToM, providing the first empirical evidence that while temporary experimental manipulations (Studies 5a and 6) may be insufficient to affect ToM, chronic exposure to scarcity, as reflected in self-reported perceptions, is associated with reduced ToM levels. Third, ToM emerged as one of the strongest correlates of objectification, with higher ToM associated with substantially lower objectification tendencies.

The divergent findings between Models A and B highlight a crucial theoretical insight: ToM does not function as a static buffer that moderates contextual influences, but rather operates as a dynamic capacity that is itself shaped by social-structural conditions while simultaneously influencing social perception. The pattern of indirect effects in Model B illuminated the complex interplay of competing mechanisms. The pathway through ToM represented the strongest negative indirect effect: perceived inequality enhanced ToM, which reduced objectification. However, this beneficial effect was partially undermined by scarcity's negative impact on ToM. The marginally significant pathway from perceived inequality through scarcity to reduced ToM to increased objectification revealed a cognitive cost: scarcity depletes the very capacity that could inhibit objectification. Ultimately, the pathway through ToM was outweighed by the combined positive effects through attentional tunneling on money and present-focused mindset. This reveals a fundamental tension: perceived inequality simultaneously strengthens ToM (a protective mechanism) while generating scarcity that both depletes ToM and activates cognitive processes that directly promote objectification.

Finally, the direct associations of scarcity and perceived inequality with objectification were consistently non-significant in Study 7's mediation models, indicating that their influence operates entirely through cognitive consequences rather than direct pathways. This pattern of total mediation underscores the importance of understanding the specific cognitive mechanisms through which structural and economic conditions shape social perception. Crucially, this finding reveals that objective or perceived structural conditions do not deterministically produce interpersonal outcomes but exert influence through measurable psychological processes. This aligns closely with the integrative framework proposed by Civali et al. (2024), which emphasizes that structural and economic conditions shape social perception indirectly, through identifiable and potentially modifiable psychological mechanisms. Rather than viewing inequality as directly associated with objectification, this mediated pathway model reveals

intermediate processes where intervention becomes possible, even when broader structural change remains challenging.

GENERAL DISCUSSION

The present doctoral research project addressed a fundamental question at the intersection of social cognition and structural inequality: how can we protect and restore the recognition of humanity in interpersonal relationships within contemporary society? Across seven empirical studies encompassing correlational, experimental, and intervention methodologies, this work examined Theory of Mind (ToM) as a protective factor against interpersonal objectification while investigating how contextual conditions, particularly scarcity, may amplify objectifying tendencies and potentially undermine this protective mechanism.

The research unfolded in two complementary parts. The first research part established ToM as a robust protective factor against interpersonal objectification across multiple methodological approaches. Study 1 provided first correlational evidence demonstrating that individuals with higher ToM capacities, assessed through both performance-based tasks and self-report measures, consistently exhibited lower tendencies to objectify others, whether measured as instrumental treatment of relationships or perception of others as objects. Studies 2a and 2b sought to establish causality through experimental manipulation of ToM activation. Although brief exposure to audio-visual stimuli designed to activate either cognitive or affective ToM did not produce measurable reductions in objectification, these null findings proved theoretically informative rather than contradictory. They revealed that ToM's protective influence operates primarily through stable individual differences, deeply internalized capacities developed over time, rather than through temporary situational activation. This interpretation aligns with the developmental literature showing that ToM represents a complex socio-cognitive achievement requiring sustained cultivation rather than a capacity easily primed through brief experimental procedures (e.g. Tomasello, 2019; Wellman, 2014). Building on these considerations, Study 3 provided the most compelling evidence for ToM's causal role in

reducing objectification. A structured school-based training program adapted from validated interventions (Lecce et al., 2014) successfully enhanced children's ToM abilities while simultaneously reducing their tendency to objectify peers across multiple assessment measures. Crucially, both cognitive and affective training conditions produced comparable benefits, suggesting that cultivating either dimension of ToM, understanding others' thoughts or emotions—provides meaningful protection against instrumental social perception. These findings indicate that ToM can be systematically strengthened through educational interventions, which in turn may generate cascading benefits for interpersonal relationships and social harmony.

The second research part extended the analysis from individual-level protective factors to contextual risk factors, examining how economic scarcity shapes interpersonal objectification and potentially compromises ToM functioning. Study 4 established foundational correlational evidence linking scarcity to increased objectification while replicating the protective association between ToM and reduced objectification observed in the first part of this research project. Notably, neither moderation nor mediation analyses yielded significant results: the interaction between scarcity and ToM did not reach statistical significance, and scarcity showed no significant association with ToM in this cross-sectional design. These null findings left open competing interpretations regarding whether ToM represents a stable protective capacity under scarcity or becomes vulnerable to scarcity's cognitive demands. Studies 5a and 5b attempted to establish causality through experimental manipulation, employing two distinct scarcity inductions: the *Stage games paradigm* and a recall-based task. Although both manipulations successfully induced subjective experiences of scarcity (confirmed through manipulation checks), neither produced significant effects on objectification in primary analyses. These null findings illuminated crucial methodological constraints: brief online manipulations proved insufficient to capture the psychological reality of sustained, real-world

scarcity. However, exploratory moderation in Study 5b revealed a theoretically critical pattern: the manipulation increased objectification only among participants already experiencing chronic scarcity in their everyday lives, suggesting that scarcity's psychological consequences accumulate over time rather than emerging from isolated exposures. Study 6 addressed these limitations through a more realistic and immersive design, anchoring the manipulation to a concrete recent event (the April 2025 Iberian Peninsula blackout) that considered participants had genuinely experienced. This methodological shift proved decisive: when scarcity was induced through sufficiently realistic, salient, and credible threat, the predicted effect emerged clearly. Participants exposed to high-scarcity conditions reported significantly elevated objectification compared to both low-scarcity and neutral conditions, providing experimental confirmation that scarcity causally promotes instrumental social perception when experienced as authentic rather than abstract. Finally, Study 7 unpacked the cognitive mechanisms linking scarcity to objectification through comprehensive mediation analyses. Employing two complementary analytical frameworks, one examining ToM as moderator (Model A), the other as mediator (Model B), this study revealed that scarcity showed associations with objectification entirely through specific cognitive pathways rather than through direct effects. Perceived inequality was associated with heightened scarcity, which correlated with both attentional tunneling on monetary concerns and present-focused temporal orientation. These cognitive patterns linked to scarcity demonstrated substantial positive associations with interpersonal objectification, consistent with theoretical predictions that resource constraints are associated with a psychological context conducive to instrumental social perception.

Critically, Study 7's findings regarding ToM diverged between analytical frameworks yet converged on a coherent theoretical interpretation. Model A revealed limited evidence for moderation: ToM did not buffer the scarcity-objectification relationship. Model B provided a more nuanced account: perceived inequality was directly and positively associated with ToM

(potentially through heightened social sensitivity), which subsequently was negatively linked to interpersonal objectification. However, scarcity showed a significant negative association with ToM, indicating that chronic resource constraints may be associated with depleted mental resources necessary for this capacity. The net pattern of associations on objectification thus depended on the relative strength of these competing mechanisms—inequality's association with enhanced ToM versus scarcity's dual associations through both cognitive pathways relating to objectification and correlation with depleted protective capacity itself.

Synthesizing across both research parts yields a comprehensive framework for understanding interpersonal objectification that operates simultaneously at individual and contextual levels. At the individual level, ToM emerges as a deeply human capacity that protects against instrumental social perception by enabling recognition of others as complex mental agents rather than mere means to personal ends. This protective function proves robust across diverse measurement approaches and manifests both correlationally and causally when examined through appropriate methodologies respecting ToM's developmental trajectory and stability. At the contextual level, scarcity functions as a powerful antecedent of interpersonal objectification, reshaping cognitive priorities in ways that facilitate instrumental treatment of others. Scarcity narrows attentional focus toward monetary concerns, making resource-related schemas chronically accessible and promoting cost-benefit evaluation of social relationships. Simultaneously, scarcity fosters short-term temporal orientation and impulsivity, leading individuals to prioritize immediate gains and evaluate others primarily through their utility for resolving pressing problems. These mechanisms operate in parallel, jointly promoting objectification through distinct yet complementary pathways.

The relationship between these two levels—individual protective factors and contextual risk factors—proves more complex than simple additive models would suggest. ToM does not uniformly buffer against scarcity's effects across all individuals and contexts. Instead, ToM

abilities may depend critically on whether scarcity is rendered only temporarily salient or is experienced as a chronic and cumulative condition. Brief scarcity exposures may be insufficient to overwhelm well-developed ToM, allowing this capacity to maintain its protective function. However, sustained scarcity may exert a cumulative cognitive burden that could be associated with depleted mental resources necessary for ToM, thereby potentially removing a critical defense mechanism precisely when it becomes most needed.

This pattern suggests a concerning asymmetry in how scarcity and ToM may interact: while high ToM seems to provide meaningful protection under conditions of mild or temporary scarcity, prolonged resource constraint may progressively undermine this protective capacity. The very cognitive processes that enable recognition of others' humanity, requiring sustained attention, working memory, and executive control, may be compromised by the persistent demands that scarcity places on these same limited cognitive resources. This could create a vicious cycle wherein those experiencing the greatest contextual pressures toward objectification simultaneously lose access to the individual-level resources that might otherwise inhibit such tendencies.

Theoretical contributions and implications

Theory of Mind. This work contributes significantly to ToM literature by demonstrating its relevance beyond traditional domains of social cognition and developmental psychology. First, it establishes ToM as a dimensional construct with meaningful individual variation in adulthood, where higher ToM capacities consistently predict more humanizing interpersonal perception. This extends prior research emphasizing ToM's role in cooperation and social understanding (Apperly et al., 2009; Paal & Berezkei, 2007) by revealing its moral and relational implications. Second, the findings challenge oversimplified models of ToM as either purely cognitive or purely affective. Although initial hypotheses predicted stronger effects for affective ToM based on its connection to emotional resonance and empathy, both dimensions

proved equally protective against objectification across studies. This convergence aligns with neuroscientific evidence showing that cognitive and affective ToM operate synergistically in real-world social contexts (Schurz et al., 2021; Preckel et al., 2018), suggesting that recognizing others' humanity requires integrated processing of both mental states and emotional experiences and, thus, that distinguishing between a cognitive and affective dimension of this construct is perhaps non particularly effective. Third, this research illuminates ToM's malleability and the conditions under which it can be strengthened or compromised. The successful school-based intervention demonstrates that structured training can enhance its development, confirming ToM as a trainable capacity responsive to systematic intervention. Conversely, findings from Study 7 regarding scarcity's negative impact on ToM reveal vulnerability in this supposedly fundamental human capacity, showing that chronic resource constraints can undermine even deeply developed socio-cognitive skills.

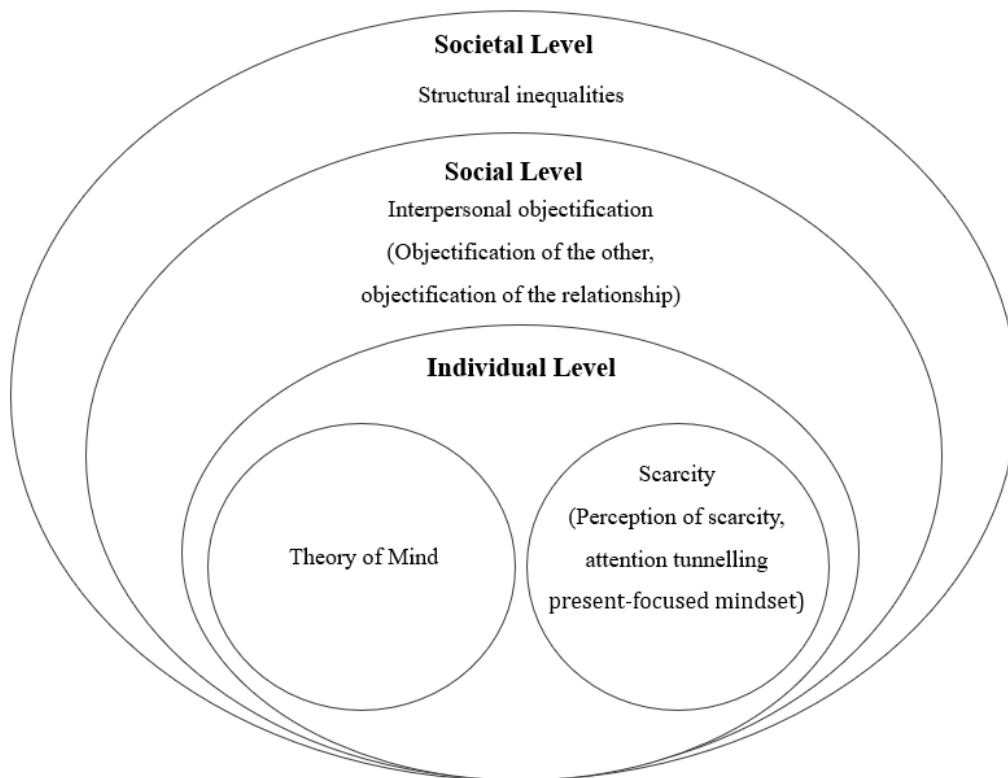
Interpersonal objectification. The present work addresses a critical gap in objectification literature by shifting focus from domain-specific analyses toward general interpersonal dynamics. Previous research concentrated overwhelmingly on sexual objectification and self-objectification (Calogero et al., 2011; Fredrickson & Roberts, 1997) or workplace objectification (Baldissarri et al., 2017; Belmi & Schroeder, 2021), with limited attention to protective factors applicable across contexts. By identifying ToM as a transversal protective mechanism operating independently of specific domains or relationships, this research opens new avenues for intervention and prevention. Moreover, these findings challenge deterministic accounts suggesting that objectification flows inexorably from structural conditions such as inequality or technological mediation. While acknowledging these contextual influences, the research demonstrates that individual differences in social-cognitive capacities meaningfully modulate vulnerability to objectifying dynamics. This suggests intervention possibilities even when broader structural transformation remains challenging—a

crucial consideration for applied psychology in contemporary societies characterized by persistent inequality. Notably, the identification of specific cognitive mechanisms linking scarcity to objectification—attentional tunneling on money and present-focused temporal orientation—provides unprecedented insight into how socioeconomic conditions penetrate social perception. Rather than viewing scarcity's effects as global or diffuse, these findings reveal precise psychological pathways amenable to targeted intervention and suggest potential leverage points for reducing objectification.

Bridging levels of analysis. Perhaps the most significant theoretical contribution lies in demonstrating how micro-level cognitive processes and macro-level structural conditions jointly determine social perception. Contemporary social psychology increasingly recognizes the necessity of multi-level analysis (Oishi et al., 2009). The present research accomplishes this integration by showing how: 1) structural inequality are strictly linked to psychological experiences of scarcity; 2) scarcity experiences reshape cognitive priorities through well-specified mechanisms (attentional tunneling, temporal discounting) while potentially depleting protective capacities (ToM); individual differences in social-cognitive capacities (ToM) can moderate vulnerability to these contextual pressures; 3) interpersonal objectification emerges as the joint product of these interacting forces, neither purely individual nor purely structural but irreducibly multilevel. This framework integrates both purely individualistic accounts that locate objectification solely in personality traits or cognitive deficits, and purely structuralist accounts that deny meaningful role for individual agency and capacity. Instead, it reveals interpersonal objectification as emerging from dynamic transactions between people and contexts, where protective individual capacities can be either strengthened through development and education or undermined through sustained contextual adversity (see Figure 1).

Figure 1

A multilevel conceptual framework bridging structural inequality, scarcity, Theory of Mind and interpersonal objectification.



Practical implications and intervention strategies

These findings suggest intervention opportunities at multiple levels. The success of the school-based ToM training (Study 3) demonstrates that systematic cultivation of this capacity can meaningfully reduce objectifying tendencies. This suggests several promising directions for educational practice. Given that ToM undergoes significant development during childhood and adolescence while also showing considerable malleability during this period, incorporating ToM training into school curricula may prevent objectifying orientations from crystallizing. Moreover, family-based interventions could extend these benefits beyond formal education. Research consistently shows that family conversations rich in mental-state language facilitate

ToM development (Ruffman et al., 2002). Programs teaching parents to engage children in reflective dialogue about emotions, beliefs, and motivations might amplify the benefits of school-based interventions while also strengthening family relationships—a secondary benefit with independent value. Also, organizational interventions represent a valuable opportunity, particularly in workplace contexts where objectification proves especially prevalent and consequential. Organizations might simultaneously: (a) enhance ToM through leadership training emphasizing perspective-taking and recognition of employees' psychological needs; (b) reduce objectifying conditions through job redesign that increases autonomy and reduces repetitiveness; (c) implement policies ensuring adequate compensation and job security to minimize economic scarcity among workers.

Finally, at a more structural level, the causal evidence linking scarcity to objectification (Studies 5b, 6) combined with findings showing scarcity's negative impact on ToM (Study 7) points toward the fundamental importance of reducing experienced resource constraint through structural reform. Direct resource provision through policies such as universal basic income, child allowances, or housing assistance can reduce subjective scarcity by ensuring basic material security. While full elimination of economic inequality may be politically challenging, even modest increases in resource adequacy for those experiencing chronic scarcity could yield meaningful psychological benefits by reducing cognitive load and preserving mental resources necessary for ToM.

Methodological contributions and limitations

The present research demonstrates several methodologically innovative approaches that future work might profitably adopt or extend. Multi-method convergence proved essential for establishing confidence in core findings. The consistent negative association between ToM and objectification emerged across performance tasks, self-report inventories, and intervention outcomes, strengthening evidence that this relationship transcends methodological artifacts.

Future research should continue employing diverse assessment approaches. Moreover, realistic manipulation enhancement represented a crucial methodological insight. Only when scarcity was induced through reference to a concrete recently-experienced event (the blackout) rather than abstract scenarios or brief laboratory tasks did predicted effects emerge. This suggests that research on chronic psychological states like scarcity may require manipulations that engage participants' lived experiences rather than attempting to create new psychological realities from scratch within artificial settings. Finally, developmental intervention rather than purely experimental manipulation proved essential for demonstrating ToM's causal influence on objectification. The school-based training succeeded where brief laboratory priming failed, confirming that meaningful change in stable socio-cognitive capacities requires sustained intervention rather than temporary activation.

Despite these methodological strengths, several limitations merit acknowledgment and suggest directions for future research. First, sample characteristics constrain generalizability. The predominantly Italian and Spanish samples across studies may not represent populations with different cultural orientations toward individualism-collectivism, social hierarchy, or economic values. Mediterranean societies' particular configurations of family structure, welfare provision, and social norms regarding interdependence could shape how ToM, scarcity, and interpersonal objectification relate to one another. Cross-cultural replication in diverse societal contexts remains essential before claiming universal applicability.

Second, measurement limitations affect both key constructs. Objectification was assessed primarily through explicit self-report, raising concerns about social desirability bias and insufficient coverage of implicit, behavioral, or interactional manifestations. ToM measurement presents additional challenges: although multiple instruments were employed to capture its complexity, the modest intercorrelations among tasks (consistent with Warnell & Redcay, 2019) complicate interpretation of which specific cognitive components—for example,

spontaneous versus deliberate mentalizing, first- versus second-order reasoning—exert the strongest protective effects. Systematic comparisons of ToM subcomponents would sharpen theoretical precision.

Third, regarding the ToM training intervention (Study 3), the absence of a control group limits causal inference. Additionally, results were obtained in a child population, whereas other studies relied on adults, introducing developmental discontinuity: generalizing the effects of ToM training to adult samples requires tailored interventions with older populations.

Furthermore, although ToM played a significant protective role, it is unlikely to be the only inhibitor of objectification. Empathy, moral reasoning, prosocial values, or justice sensitivity may interact with or complement ToM in reducing instrumental social perception. Integrating multiple protective mechanisms could yield a more comprehensive explanatory framework.

Limitations also concern causal inference. The correlational studies permit alternative causal interpretations that warrant careful consideration. Study 7's findings, in particular, face inherent constraints due to the cross-sectional nature of the data. The observed positive association between perceived inequality and ToM, for instance, admits multiple directional interpretations: while inequality perception may enhance ToM by increasing social sensitivity and motivating attention to others' mental states, it is equally plausible that individuals with higher ToM capacities are more attuned to detecting and recognizing social inequalities in their environment. This suggests a potentially bidirectional relationship wherein perceived inequality enhances ToM, yet simultaneously, elevated ToM sharpens perception of existing inequality—a recursive dynamic that cross-sectional designs cannot disentangle.

More broadly, the correlational evidence linking scarcity to objectification leaves open competing causal pathways: individuals who objectify others may experience greater relational conflict or social isolation, contributing secondarily to economic hardship and subjective

scarcity experiences. Alternatively, shared antecedents—chronic stress, early adversity, or attachment insecurity—may jointly predict both scarcity experiences and objectifying tendencies without direct causal connections between them.

A related limitation concerns the divergent findings from temporarily induced versus chronically experienced scarcity. Experimental manipulations generally failed to affect ToM, whereas correlational Study 7 suggested a negative association between perceived scarcity and ToM. This discrepancy implies that ToM may be sensitive to prolonged, cumulative exposure rather than short-lived scarcity, or that chronic scarcity correlates with unmeasured contextual factors (educational access, cognitive stimulation, social complexity) that also shape ToM. Future longitudinal research with repeated assessments tracking individuals experiencing varying degrees of economic constraint across extended periods, combined with experimental interventions targeting specific causal pathways, would clarify whether scarcity directly depletes ToM capacities over time or whether the observed associations reflect selection effects and confounding variables, ultimately illuminating the temporal dynamics through which structural conditions penetrate individual psychology.

CONCLUSIONS

Social relationships in contemporary societies are undergoing a profound crisis. Market logics, consumerist values, and an abuse of digital technologies risk transforming human interactions into transactional exchanges, in which others become mere instruments for personal goals. The proliferation of objectification across domains—from sexualized media representations to algorithmic workplace management—threatens both individual dignity and social cohesion. Yet existing literature has offered limited guidance regarding protective psychological resources that might resist these dehumanizing pressures or intervention strategies that might restore humanizing perception.

The present work addressed this gap by demonstrating that Theory of Mind—the fundamental human capacity to recognize others' thoughts, feelings, and intentions—functions as a powerful protective factor against interpersonal objectification. When individuals see others as complex mental agents rather than mere physical entities or functional tools, instrumental treatment becomes psychologically incongruent and morally objectionable. This protective mechanism proved robust across multiple assessment methods and amenable to systematic cultivation through educational intervention, suggesting realistic pathways for resistance against objectifying cultural currents.

However, the research also revealed troubling vulnerability in this protection. Scarcity, which is a product of structural inequality increasingly characterizing contemporary societies, creates psychological conditions conducive to objectification through specific cognitive mechanisms while simultaneously undermining ToM, the very capacity that could provide defense, thus creating a particularly pernicious dynamic.

These findings carry profound implications for both theory and practice. Theoretically, they demonstrate the essential interdependence of individual capacities and structural conditions in shaping social behavior. Practically, they indicate that reducing objectification

requires coordinated intervention at multiple levels. Efforts to cultivate ToM skills through education and training represent necessary but insufficient responses; enhancing economic stability may not fully restore humanizing social relationships if they neglect the development of social-cognitive capacities enabling recognition of others' subjectivity. Optimal intervention strategies likely involve integrated approaches simultaneously developing individual resources and reforming structural conditions, that could strengthen both the capacity for humanizing perception and the contexts enabling its expression.

The challenge facing contemporary societies, then, is not merely technical (e.g., identifying effective interventions) but fundamentally ethical and political: summoning collective will to prioritize human dignity over economic efficiency, to invest in capacities enabling recognition of shared humanity, and to construct social arrangements preserving space for relationships irreducible to instrumental exchange. This research demonstrates that such priorities rest not on utopian aspiration but on empirically grounded psychological realities. People genuinely do possess capacities for humanizing perception that protect against objectification; social and structural conditions shape whether those capacities are cultivated or eroded, and interventions can strengthen both individual resources and structural conditions. Whether contemporary societies choose to act on this knowledge, or allow further drift toward pervasive objectification, remains an open question whose answer will profoundly shape the quality of human relationships and the possibility of authentic social connection in decades to come.

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