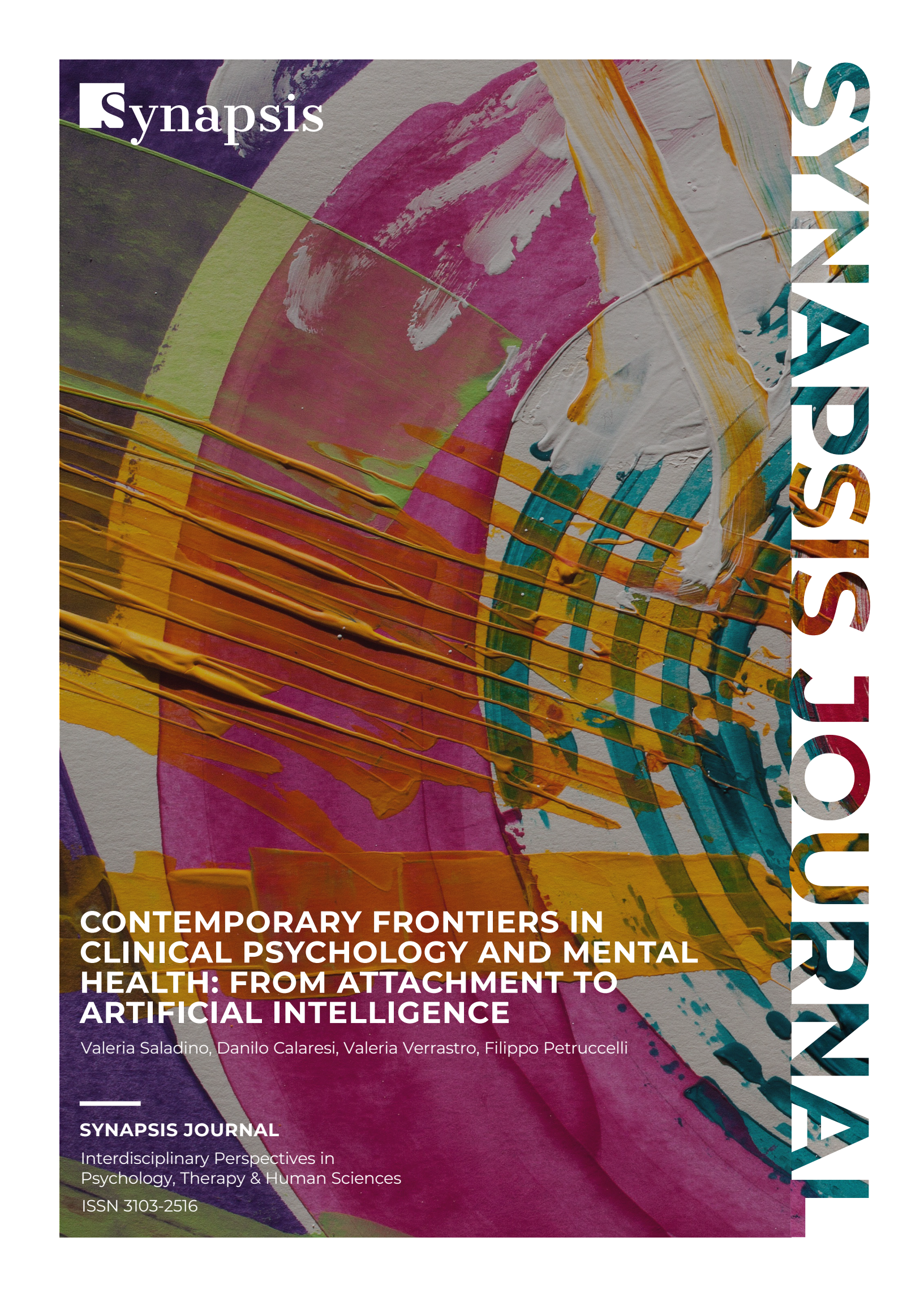




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CLINICAL PSYCHOLOGY AND MENTAL
HEALTH: FROM ATTACHMENT TO
ARTIFICIAL INTELLIGENCE**

Valeria Saladino, Danilo Calaresi, Valeria Verrastro, Filippo Petruccelli

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Digital Emotions and the Commodification of Affect: Toward a Critique of Vital Subsumption

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Abstract

This study critically reflects on the concept of "vital subsumption" by examining the complex interaction between emotions, digital technologies, and the contemporary social fabric. The analysis explores the process through which these emotional experiences acquire the dual value of commodities and tools, with significant economic and social implications. This exploration is informed by the recognition that emotions, historically rooted in face-to-face interactions, are now transmitted and transformed through digital platforms. The study underscores the manner in which digitalization contributes to the redefinition of relational dynamics, thereby fostering the emergence of a novel paradigm in which emotions are not only intrinsic and private, but also an integral part of market logic and communication strategies. The study draws on a critical review of extant literature, highlighting aspects related to behavioral changes induced by the adoption of digital technologies, emphasizing the need to reconsider traditional relational models. Moreover, the notion of "vital subsumption" is identified as pivotal to the interpretation of novel emotional articulations and the provision of insights for the reinterpretation of the ethical and social ramifications of this transformation. The results obtained provide a solid theoretical basis for further studies, contributing significantly to the debate on the frontiers of digitalization and the interaction between emotions and society.

Keywords: vital Subsumption, digital emotions, emotional economies

Introduction

In contemporary society, digital technologies have profoundly changed the ways in which people experience, express and share emotions. Digital platforms are complex devices that mediate and shape emotional relationships, generating new forms of interaction and blurring the boundaries between public and private, and between authenticity and performance. As Eva Illouz (2007) observes, in modern societies, emotions are increasingly codified through cultural and media logics. In late capitalist societies, this process is intensified through the integration of emotions into digital circuits, where they become marketable 'mediated objects' and 'relational goods'. Digital culture not only facilitates emotional communication but also introduces new regimes of visibility and affective performativity (Papacharissi, 2014). These impose normative practices that guide the construction of identity and the regulation of emotions. The digital self is not spontaneously expressive; it is constructed through a process of 'affective attunement' (Paasonen, 2016), in which emotional sharing is often guided by algorithmic logic and visibility metrics. According to Taina Bucher (2018), this creates an algorithmic infrastructure of affectivity in which emotions circulate, are curated, ordered, and monetized by the plat-

forms themselves. Consequently, when analyzing emotions, it is crucial to consider the logics of power, the market and subjectivation that underpin the digitalization of everyday life. In line with the analyses of Foucault (1982) and, more recently, Hardt and Negri (2000), subjectivity is not innate but is produced within biopolitical systems. In the digital age, these systems are characterized by an 'affective capture' of users' lives. As Zuboff (2019) explains in her theory of 'surveillance capitalism', emotions are increasingly being expropriated, quantified, and redirected. They are becoming not only resources to be monetized, but also tools for prediction and behavioral governance. This contribution to the current theoretical debate proposes the concept of 'vital subsumption' as a means of understanding how digital capitalism appropriates and reconfigures emotions. Borrowed and reworked from post-Marxist reflections, this concept describes the tendency of capitalism to incorporate not only the workforce, but also the entirety of existence. It incorporates elements of affective, relational, and cognitive life into production processes (Hardt & Negri, 2004; Berardi, 2009). Vital subsumption specifically refers to the complete integration of life into the productive machine according to a logic of continuous valorization, whereby affections are transformed into labor power and relationships into economically computable resources (Marazzi, 2010). In

platform capitalism, emotions are captured and translated into data, which is then reinserted into value extraction circuits via algorithmic mechanisms that amplify its reach and economic usability. As Shoshana Zuboff (2019) points out, surveillance capitalism does not merely observe behavior; it also aims to predict and shape users' emotional responses, exploiting them for control and monetization purposes. Digital platforms therefore operate as devices for absorbing emotions, converting them into 'emotional capital' (Illouz, 2007) that can be commodified. By analyzing everyday digital practices — such as likes, voice messages, emotional memes, and the use of emojis and reactions — we aim to demonstrate how emotions serve dual functions as commodities and as tools for connection and loyalty. As Tiziana Terranova (2004) observes, in digital economies, affective production is a central component, not a by-product, of the value generated. Thus configured, emotions become objects of consumption and vectors of control and governance of subjectivity according to logics that intertwine affectivity, power and algorithms (Beller, 2018; Terranova, 2022). The study has two objectives. Firstly, it seeks to provide an in-depth theoretical analysis of the changes impacting relational and emotional models in contemporary society, focusing specifically on the intersection between emo-

tional experiences and digital media. Secondly, the analysis aims to critically examine digital infrastructures as active agents in shaping emotional experience and capable of influencing forms of subjectivation and social dynamics, rather than merely as neutral tools of communicative mediation. Adopting a mixed methodology that integrates a critical and selective review of theoretical literature with an empirical observation of technologically mediated communicative and affective practices, this study contributes to the interdisciplinary debate on the ethical, social, and political implications of the affective economy. The study thus seeks to provide an analytical framework that can illuminate the logic of the valorization and commodification of emotions within the digital ecosystem and stimulate critical reflection on emerging relational paradigms. Before delving into the details of this paper, it is helpful to introduce some theoretical concepts to assist the reader in navigating the subject matter more easily. Several studies focus on experiences generated online that produce emotional states fundamental to the recipient. For example, the analysis of emotional states conducted by Liu et al. in 2017 on 181 university students in California and Los Angeles, aged 18–20, confirms that publishing updates, tweets, and hashtags on Twitter (now X) is linked to one's emotional state at the time. According to the authors, tweets and social

media communications reflect the feelings and emotions experienced at the time of publication and can therefore provide real-time monitoring of users' stress levels and emotional well-being. Another interesting study was conducted in 2016 by Seabrook et al., investigating the link between anxiety, depression, and social network use. Significant associations emerged from the analysis. Therefore, digitalization is not only transforming the social fabric, but also the emotional fabric. This is defined by López and Marcuello-Servós as 'the set of relationships, structures and elements involved in the adoption of ICTs in any aspect of life' (López and Marcuello-Servós, p. 801, 2018). These technologies are transforming innovation itself, deconstructing what has until now been recognized as the norm — such as the caution some people used to exercise when accessing the internet — and restructuring not only the internet itself, but also scientific practices (Auriemma, 2023). Clearly, such a process of adaptation is neither useful nor sufficient (López & Marcuello-Servós, 2018). In this regard, this process lacks in-depth analyses of the media used, modes of interaction, and the intensity of emotions experienced. Consequently, we find ourselves in a situation where, on the one hand, empathy and emotions in general are being devalued, while, on the other hand, a fetishism of emotions is developing — a constant desire for excitement. Emotions thus

become a necessary tool for generating a system of supply and demand. The risk is that, within a process of subsumption, we become distracted, dependent consumers not only of our work, but also of the emotions we experience while working (Auriemma, 2023).

Emotions as commodities and tools

In today's digital economies, emotions have gradually acquired an ambivalent status, becoming both exchangeable commodities and operational tools for economic and symbolic enhancement within online platforms. This transformation can be understood in the context of a cultural and technological paradigm shift that has gradually shifted the focus from material production to affective experience as an economically relevant resource (Hardt, 1999). In this sense, emotions are no longer merely internal states of individuals; they have become cultural artefacts and performative devices that are generated, codified and circulated within a technical-media infrastructure which allows them to be extracted, quantified and monetized. One of the most obvious manifestations of this process can be seen in the architecture of social platforms, where seemingly trivial gestures, such as 'liking', 'hearting' or using an emoji, are continuously collected, analyzed and converted into behavioral data that can be used to profile users. As Shoshana Zuboff (2019) observes, within 'surveillance capitalism',

digitized emotions constitute an immaterial raw material extracted from unsuspecting individuals to fuel predictive models and targeted advertising. From this perspective, emotions are subsumed under extractive logics that erase their subjective and relational dimensions, transforming them into computable capital. However, the economy of emotions is not limited to passive commodification. Emotions also operate as active tools for negotiating and constructing identity. As Zizi Papacharissi (2014) points out, users consciously employ affective repertoires to curate their personal narratives within 'affective publics', which are digital spaces where feelings become a privileged medium for social and political participation. Through these practices, individuals express emotional states and perform affiliations, ideological positions, and symbolic relationships. This contributes to the construction of what Arlie Hochschild (1983) defines as 'emotional management', which is redefined today within algorithmic logics. This instrumentalization of emotions is part of a broader change in contemporary culture, where, as Eva Illouz (2007) argues, emotional discourse has become the lingua franca of social relations, marketing, and work interactions. In this context, emotions are used not only to promote products and services, but also to create and consume content, which is subject to standardization, aestheticization and

optimization. Platforms act as catalysts for these dynamics, shaping emotional expression through engagement-oriented design, personalized feeds and quantitative metrics that incentivize the visibility of affection. Therefore, the affective dimension can no longer be conceived as a residue of intimacy or interiority, but rather as a strategic resource situated at the intersection of the economy, technology and culture. In this sense, digital emotions become true political and productive agents at the center of a post-Fordist regime in which value is constructed through continuous interaction between subjectivity and platform (Berardi, 2009; Masumi, 2002). This requires a radical rethink of the role of emotions in social life. Rather than being considered secondary data in human experience, emotions are now seen as crucial to understanding contemporary power relations and neoliberal dynamics. In the current socio-technological landscape, the affective economy is one of the most significant emerging forms of capitalist valorization. Here, individual emotional experiences are systematically translated into economic value via the technological mediation of digital platforms. This process forms part of a broader post-Fordist transformation in which immaterial labor, particularly affective labor, plays a central role in wealth production (Hardt, 1999). Rather than being a marginal or

decorative element of digital interactions, affectivity becomes the fulcrum of a new cognitive-relational economy in which users' emotional reactions are resources to be capitalized on. As both Hardt (1999) and Illouz (2007) observe, the affective economy is based on the contemporary capitalist system's ability to capture, shape, and reinvest emotions as forms of value. On digital platforms such as Facebook, Instagram, TikTok and X (formerly Twitter), users' emotional expressions (e.g. likes, hearts, emojis, reactions, comments and shares) are constantly tracked and collected through sophisticated algorithmic monitoring systems. Although these affective signals are minimal in terms of their materiality, they function as highly significant behavioral indicators as they allow tastes, inclinations, desires and moods to be mapped. Their aggregation and analysis fuel the extractive logic of platform capitalism (Srnicek, 2017), in which the primary goal is to generate behavioral data that can be used to create consumer profiles, design targeted advertising campaigns and optimize digital environments. Thus, emotions enter the circuits of value production and are transformed into actual units of semiotic and economic exchange. As Zuboff (2019) points out, such affective data constitute the raw material of 'surveillance capitalism', a new accumulation regime in which anticipating and influ-

encing users' future behavior is more profitable than directly selling goods or services. Digital platforms therefore operate as semiotic machines, converting emotional experience into symbolic and monetary capital through gamification, visibility metrics, and reward systems that incentivize the continuous production of affectivity. This dynamic has significant effects from economic, cultural and psychosocial perspectives. As Eva Illouz (2007) points out, emotional discourse is taking on an increasingly central role in the construction of identity and social relations. This discourse is being codified and media-tized according to the logic of mediated communication. The way emotions are expressed, performed and recognized in digital contexts does not allow for spontaneity; rather, they are filtered through the technical design of platforms and the imposed affective grammars. In this sense, emotions are consumer products and normative devices that regulate access to visibility and social legitimacy. Therefore, the affective economy does not merely record users' emotional state; it produces, organizes and redistributes it according to algorithmic criteria in a continuous cycle of extraction and valorization. This transformation necessitates critical reflection on the assumptions of contemporary subjectivity, which is increasingly shaped by the logic of emotional transparency, affective performativity, and the commodification of

the self. In the context of contemporary digital culture, the so-called 'emotionalization of communication' (Wittel, 2001) is a cross-cutting and structural element of the various media regimes that characterize the platform era. This concept describes the increasing importance of emotions in communication processes. Rather than being a marginal element of information transmission, emotions become the core of performative and relational processes through which social bonds are formed and maintained. In other words, emotions are not just expressed or shared; they represent the primary symbolic currency of interactions and can generate value in the form of social capital, media attention, and algorithmic recognition. Andreas Wittel (2001) has effectively described this dynamic in his analysis of the transformation of communication in networked societies. He observes how the liquid, discontinuous and performative nature of digital relationships imposes a new form of 'network sociality' based on the constant production and circulation of emotional content. In this scenario, communication is less oriented towards the rational exchange of information, and more towards producing temporary, situated — often weak, yet emotionally dense — bonds that act as catalysts for engagement and social visibility. The centrality of emotions in this media ecosystem must be considered considering a broader cultural shift. As Eva Illouz (2007) has

demonstrated, affectivity is no longer viewed as a private, spontaneous and natural phenomenon. Instead, it is a culturally and historically codified construct, shaped by discursive grammars, social expectations and technological practices. In other words, emotions are cultural devices that are learned, performed and consumed within specific socio-technological contexts, rather than universal biological entities. Illouz highlights how contemporary capitalism, particularly in its neoliberal forms, has embraced emotional discourse as a strategic resource, resulting in what she terms 'emotional capitalism': a system in which the language of emotion permeates market relations, work practices, and personal interactions. This process of emotional codification is particularly relevant in the context of digital platforms. Through the design of interfaces, algorithms and metrics, digital media impose ways of expressing and managing emotions. Emojis, reaction buttons, automatic reactions, short comments and temporary stories all structure affective communication according to pre-established forms, encouraging the simplification and standardization of emotional states. These devices are by no means neutral but constitute what Illouz (2007) defines as an 'emotional regime', i.e. a set of norms and practices that guide the production, expression, and recognition of emotions. In this context, emotions also become fundamental to the

construction of digital identity. In fact, affective performativity lies at the heart of what Papacharissi (2014) refers to as 'affective publics': digital communities formed around shared emotional narratives that replace argumentative logic with a more sensitive and sentimental approach. Users connect, participate and mobilize not only based on common ideologies or interests, but primarily through emotional bonds that foster feelings of belonging, empathy and indignation. This 'emotionalization of the public sphere' redefines the construction of collective discourses, transforming political, cultural or social debate into an arena dominated by emotions, sensations and instant reactions. In this sense, digital platforms operate as biopolitical devices that capture attention and shape users' subjective experience, inducing specific forms of 'emotional availability'. The design of interfaces encourages users to have the expected and desired emotional responses and reinforces mechanisms of social recognition by providing immediate feedback such as likes, views and comments. This association between emotional expression and visibility is reinforced. As Berardi (2009) points out, in a context dominated by hyperstimulation and cognitive saturation, emotion becomes the primary means of conveying meaning, gradually replacing reflection with reaction and depth with immediacy. The performative and regulated nature of emotional

expression in digital contexts also has profound psychosocial implications. As Ahmed (2004) observes, emotions are not only the result of social relations, but also a cause: they 'circulate' between bodies, creating proximity and distance simultaneously, and including and excluding at the same time. In digital environments, this circulation is mediated by technical infrastructures that amplify certain emotions, such as indignation, fear, and compassion, while silencing others. This generates veritable selective affective economies. This phenomenon is particularly evident in the algorithmic logic of virality, which rewards emotionally intense, polarizing and easily shareable content, thereby encouraging a culture of 'hyper-emotionalization' (Leys, 2011). The consequence is the progressive internalization of this logic by users, which influences how they construct their sense of self. Digital identity is shaped by constant interaction with a platform's emotional codes, producing subjectivities defined by how users feel and express these feelings publicly. From this perspective, the self becomes a 'brand persona' that must continually demonstrate emotional authenticity to gain visibility, approval, and social capital (Marwick & Boyd, 2011). Emotions are therefore not only a means of communication, but also a criterion for legitimization and a measure of social participation. In this context, it is

crucial to question how emotions are channeled, managed and exploited by the technical architecture of platforms. Digitally mediated emotional communication is never neutral, but is always oriented towards economic, governance and control purposes. As Zuboff (2019) points out, digitized emotions are one of the most important assets of surveillance capitalism as they enable not only the prediction of future behavior, but also its conditioning through sophisticated affective engineering. In short, the so-called 'emotion-alization of communication' is now a multi-level process involving technological, cultural, economic and psychological dimensions simultaneously. Emotions are no longer merely an intimate aspect of human experience; they are at the heart of an epistemic and productive regime in which affect, information, and value converge. They are generated, performed and measured according to extractive and regulatory logics, which impose new modes of subjectivation and hierarchies of visibility. Understanding these mechanisms therefore requires a critical, interdisciplinary approach that can grasp the profound interconnection between emotion, technological mediation and power. From this perspective, emotions are not only objects of exchange, but also genuine tools for engaging with, optimizing and governing users.

Materials and Methods

This narrative review employs an interdisciplinary approach, integrating critical theory, media studies, and affect theory to conceptualize the transformation of emotional life within the context of digital capitalism. Rather than collecting primary empirical data, the research utilizes a structured interpretative analysis of existing theoretical frameworks. A particular focus is placed on the manner in which concepts such as the commodification of emotions, the phantomization of affect, and algorithmic governance are articulated in contemporary academic literature. The research was conducted using the digital library for social sciences JSTOR, according to the following inclusion criteria: a) articles published from 2019 to 2024; b) articles only in English language.

The analytical process is divided into three primary phases:

-A selection of theoretical sources was made for the purposes of this study. The contributions under scrutiny were selected based on their thematic pertinence and critical acclaim within the domains of digital media, the sociology of emotions, and political theory. The conceptual foundation of the investigation was established through the contributions of renowned authors such as Illouz, Ahmed, Zuboff, Hardt, and Foucault.

-The following elements are incorporated into the conceptual mapping and synthesis: The

selected texts were examined to trace how affective phenomena are theorized in relation to technological infrastructures and market dynamics. A comparative analysis of recurring themes was conducted, encompassing emotional performativity, the datafication of affect, and networked intersubjectivity.

-The heuristic application of the concept of vital subsumption is demonstrated as follows: The study draws from post-Marxist and Foucauldian traditions, proposing vital subsumption as an interpretative lens to understand how emotions are incorporated into digital value-generating systems. This concept underwent a process of refinement through iterative dialogue with existing literature, culminating in its utilization to underscore the epistemological lacunae inherent in prevailing approaches.

Results

Redefining relationships in the digital age: Emotional performativity, identity and social bonds

In today's world, where digital technology plays a significant role in our daily lives, the ways in which people establish, maintain and transform social connections are undergoing significant changes. The emergence of an affective economy and the increasing 'emotion-alization' of digital platforms mean that we

need to reconsider the nature of social relations. These are no longer based solely on face-to-face interaction or discursive communication; they are also deeply influenced by digital emotional codes. From this perspective, emotions not only reflect internal states or accompany relationships, but also perform, constitute and enable them within algorithmic communication ecosystems. To grasp the impact of digitized emotions on relationship dynamics, the paradigm of performativity is a useful reference point. This concept has been gaining prominence in the social sciences since the 1990s. The term 'performative' was originally developed by Austin (1962) in the context of the philosophy of language. It was subsequently adopted by Judith Butler (1990) to describe the social production of gender and identity through iterative linguistic and bodily acts. Within this theoretical framework, identity is not considered an inherent quality, but rather the result of repeated and socially codified practices. Applying this perspective to the fields of emotions and digital interactions reveals that emotions not only accompany social relations, but also constitute them through codified practices of expression, reception, and recognition. As Sara Ahmed (2004) has argued, 'emotions are not simply something you have or are, but something you do': they are performative acts that generate attach-

ments, exclusions, and affective configurations of the social world. In the digital environment, these emotional acts are mediated by technical infrastructures, such as emojis, reaction buttons and visibility algorithms, which determine their form, frequency and meaning. In the context of digital platforms, the expression of emotions takes on a coded, publicly visible form. Seemingly simple actions such as liking, sharing content, inserting an emoji or posting a story constitute performative acts through which individuals communicate emotions and actively construct identities, social positions and networks of relationships. These practices form part of what Papacharissi (2014) defines as the formation of 'affective publics': temporary communities that are built around shared emotional narratives rather than ideological or rational foundations. In these configurations, emotion is not only a vehicle for content, but also the foundation of social bonds. Therefore, relationships are not necessarily structured based on physical proximity or discursive coherence, but rather through forms of emotional resonance intensified by algorithmic infrastructure. Digital emotional expressiveness is thus a practice that renders individuals visible while simultaneously placing them within affective hierarchies, temporary communities, and circuits of meaning. Emotional visibility becomes a value in itself — a strategic resource that can be exploited in terms of

attention, influence, participation, and social recognition (Marwick & Boyd, 2011). These mechanisms constantly construct and negotiate identity through the public reiteration of coded affections, balancing authenticity with performativity. Digital platforms do not merely host users' emotional performativity; they also profoundly condition its modalities through technical and economic logics. As Gillespie (2014) points out, visibility algorithms operate as regulatory devices that select, order and hierarchies emotional content based on predictive and economic criteria. In this sense, emotional expression is encouraged when it is 'engaging', i.e. when it can stimulate rapid reactions, sharing and involvement. Digital emotional performativity is therefore embedded within an algorithmic regime that favors certain emotions, such as indignation, surprise, nostalgia and fear, while penalizing those that are considered less functional within the attention economy. This mechanism produces a 'natural selection' of visible emotions, contributing to the polarization of public discourse and the standardization of connection methods. The resulting relationships are often ephemeral and reactive, oriented towards visibility rather than depth. Another element that characterizes the redefinition of relationships in the digital environment is the increasing dramatization of intimacy. As Illouz (2007) observes, contemporary culture is permeated by a 'mediatization

of emotions' that transforms the affective sphere into a public performance. On social media, this trend is evident in the common practice of sharing personal moments, moods, and emotional connections via highly curated visual and textual narratives that adhere to the platforms' aesthetic and moral standards. Such practices of affective self-narration are not only a means of self-expression, but also a form of emotional labor (Hochschild, 1983), which is aimed at producing recognition, symbolic support and sometimes economic capital. The spectacularizing of intimacy redefines the concept of 'private' and generates new relational configurations, blurring the boundaries between authentic affection, performance, and communication strategy. From this perspective, digital emotions take on the function of real relational infrastructure, providing a structural, albeit immaterial, basis on which social bonds are built and maintained. They accompany interactions and constitute their precondition. Mutual recognition, trust, loyalty and solidarity are increasingly conveyed through minimal emotional signals (such as likes, reactions and story views) that take on significant meaning within the everyday microphysics of online social relationships. As Massumi (2002) has demonstrated, emotions precede and influence rational meaning; they are pre-cognitive 'intensities' that direct attention, desire and action. In the digital

sphere, these intensities are continuously recorded, analyzed and mobilized by platforms that operate as 'affective machines' capable of channeling emotion towards forms of participation and consumption. In this sense, emotions are not merely content; they are infrastructures through which society is constructed, articulated and governed. The redefinition of relationships considering emotional performativity also raises important ethical questions. Internalizing performative and algorithmic logics in the management of emotions carries significant risks, including the loss of emotional authenticity, the instability of relationships, dependence on external feedback and emotional manipulation by economic actors. As Berardi (2009) argues, the colonization of imagination and affectivity by the market produces forms of alienation that affect not only work, but also the entire psychic and relational life of the individual. In response to these critical issues, there is a need to develop a new relational ethic that recognizes the complexity of emotional performativity and promotes more conscious, plural and inclusive forms of interaction. This requires, firstly, the deconstruction of the emotional regimes imposed by platforms, and secondly, the promotion of relational practices that transcend the logic of visibility, calculation and efficiency. Redefining relationships in the digital environment is one of the most complex and fascinating challenges

of our time. Emotions digitized and performed on platforms do not merely reflect identity and social bonds; they also constitute, shape and regulate them. In this context, emotional performativity is an ambivalent practice: it enables new connections, solidarity and visibility, but also exposes individuals to control, standardization and relational insecurity. Understanding these mechanisms requires an interdisciplinary approach that combines social theory, media studies, ethics and digital anthropology. Only then will it be possible to analyze and imagine alternatives to the dominant modes of relationship building in the digital world.

Future and innovative paradigms: Calling for a relational ethic that matches the new emotional infrastructures

What has been described is therefore a sort of preamble to what we are experiencing today on the internet, particularly in the part of the internet that has become the new American dream. The quest for fame is becoming increasingly urgent. The world is based on views, likes and comments, and their absence denotes a social position that relegates a person to anonymity. In his analysis of transcendental subjectivism (i.e. the a priori of experience), Husserl (1952) aimed to emphasize that sensory experience should be set aside to place the Ego at the center. This is lacking today, with a preference for sensory

experience, which Husserl defines as a 'dream', but which has been transformed into a series of virtual images projected onto the individual. This represents a return to a pre-Cartesian conception, which sanctions the disappearance of the subjective self and leaves individuals with a passive view of the world. Socio-technological transformations triggered by digital platforms and ubiquitous communication technology have radically changed the forms of social relations and the ways in which emotions are expressed, shared, codified and valued. In this context, the future of human relations appears as a field of tension and experimentation, in which it is essential to develop new theoretical and practical approaches to confront the growing algorithmic infrastructure of the emotional sphere. Emotions are no longer confined to the intimate realm of subjective experience; they have become tangible objects of governance, exchange and capitalization (Illouz, 2007; Striphas, 2023). Considering these changes, it is crucial to develop a critical and proactive approach to the future that considers the complexity of the dynamics at play and directs individual and collective action towards fairer, more diverse and more sustainable forms of emotional coexistence. As Hardt (1999) and Illouz (2007) note, the intertwining of technology, emotion and capitalism takes shape in the configuration of an affective economy — a productive regime in

which emotions become resources to be mobilized and monetized. In this context, emotions are transformed into data flows, segments of attention, and behavioral patterns that can be used to profile users and predict their future behavior (Zuboff, 2019). Interaction devices such as likes, hearts, reactions and emojis are not merely expressive tools; they are mediatized interfaces through which emotion is computed, classified and redistributed according to the logic of algorithmic optimization. Digital platforms, as affective architectures (Paasonen, 2023), influence not only what we can feel, but also how and in what form we should express it. They structure emotions as units of calculation and symbolic capital (Marwick & Boyd, 2011), thereby promoting a performative and quantified view of the self and of relationships. In this scenario, the future of social interactions appears to be governed by an algorithmic rationality which not only measures the emotional world, but also actively produces it, thereby generating new socially and economically functional regimes of affectivity (Gillespie, 2014). As the affective economy evolves, artificial intelligence systems that can recognize, interpret and simulate human emotions are playing an increasingly important role. Technologies such as sentiment analysis, emotional facial recognition systems, and affective voice assistants are changing the way

humans interact with machines and are redefining the boundaries between humans and machines. Conversational agents (chatbots, AI companions, etc.) are now designed to establish empathetic relationships by modulating the emotional tone of communication and simulating 'credible' emotional responses (Crawford, 2021). These technologies raise crucial ethical, political, and anthropological questions: what does it mean to 'feel' emotions in a context where they can be simulated or artificially modulated? What are the implications of delegating care, listening or comfort to non-human entities that operate according to predictive protocols? Furthermore, what new forms of dependence or relational alienation may emerge from the intimacy established with synthetic affective agents (Danaher, 2019)? In this sense, critical reflection on the ontological and epistemic status of digital emotions, and on the possibility of discerning between lived, performed and computed emotion, is essential for the future of relationships. In an environment where the appearance of affectivity can replace its embodied experience and emotional competence is trained rather than felt, the distinction between authenticity and simulation is becoming increasingly blurred. Considering these developments, there is an urgent need to explore the potential for new theoretical paradigms that can capture the unique nature of relationships in the digital

age, moving beyond the limitations of individual psychology and traditional sociology of emotions. Some recent contributions to the fields of affect studies (Clough, 2007; Ahmed, 2004) and media theory (Parikka, 2012; Paasonen, 2023) offer valuable insights in this regard. These approaches emphasize the relational, transindividual and infrastructural nature of affect, rejecting an internalized and essentialist view of emotion in favor of a situated, processual, technologically mediated understanding. In this context, emotions are not the property of a subject, but rather flows, vectors and intensities that traverse bodies, devices and environments. In turn, the subject is configured as an unstable node within affective networks that traverse, constitute and modify it. Therefore, emotional subjectivation does not occur in isolation, but is shaped by digital emotional ecologies that select, amplify or inhibit certain emotional patterns (Massumi, 2002; Braidotti, 2013). This process has two outcomes: firstly, a greater awareness of the intersubjective and mediated nature of affections, and secondly, growing exposure to normative regimes that regulate emotional expressiveness according to metrics of visibility, engagement, and adaptation to standards of algorithmic recognizability. In this context, the relationship must be reconceptualized as a political and aesthetic space in which the sense of 'being with' others — whether human or non-human — is

removed from functional logic and returned to the sphere of encounter, otherness and co-creation. If the present is characterized by the colonization of emotions by extractive and computational logics, then the future must be conceived as a space for critical imagination where alternatives to dominant emotional infrastructures can be developed. This suggests, above all else, the acknowledgement of the political character of emotions: they are not merely private sentiments, but rather components of the social structure, instruments of inclusion and exclusion, mobilization and control (Ahmed, 2004). This necessitates the conceptualization of digital environments and interaction models that do not reduce emotions to commodities or signals of consumption but rather recognize them as dimensions of the human condition. This entails the promotion of platforms that facilitate non-mediatized forms of affective communication, recognize the complexity of emotional experience, protect vulnerability and encourage relational practices based on listening, care and reciprocity (Van Dijck, 2013). In this regard, it is possible to delineate several design principles that can serve as a framework for the development of alternative affective futures. Decentralized affectivity can be defined as the promotion of relational models that are not based on the centrality of the self, but rather on reciprocity, widespread rela-

tionality and the recognition of interdependence. The concept of situated emotionality can be defined as the valuing of cultural, historical and bodily specificities of emotions. This contrasts with the standardizing universalism of global platforms. The ethics of care emphasize the promotion of practices of active listening and empathetic response. These practices are not directed towards data accumulation or control, but rather towards the provision of mutual support and the co-construction of inclusive affective spaces. In the context of the digitalization of emotions and the growing centrality of platforms as spaces for socialization, production and affective consumption, there is a strong need for a new ethical horizon that can regulate and guide the relationship between technologies and individuals. The present paper calls for a relational ethics that is commensurate with the new emotional infrastructures. To achieve this, it is necessary to imagine and design spaces for interaction that not only promote emotional well-being, but do so in an equitable, fair and responsible manner. In addition, such spaces must protect the authenticity of human experience and promote harmonious integration between affective, social and technological dimensions. This ethical framework acknowledges the inherent vulnerability of emotion while simultaneously affirming its transformative capacity. It is a system that

fosters the establishment of stronger, fairer, and more conscious bonds.

Discussion

The transformations brought about by the digitalization of emotions and the emergence of new affective infrastructures profoundly question not only the nature of social relations, but also the very constitution of the subject in the contemporary era. Emotions, which have always been subject to social regulation (Hochschild, 1983), now appear to have been completely restructured by extractive and algorithmic logics, which reduce their complexity and ambivalence to standardizable metrics, computable signals, inputs for behavioral profiling and predictive governance of bodies and subjectivities (Zuboff, 2019; Gillespie, 2014). In this context, as Illouz (2007) has argued, the affective sphere can no longer be conceptualized as a private and autonomous dimension of experience. Instead, it should be understood as the result of socio-technical processes that are historically situated and deeply politicized. The centrality assumed by digital platforms in the production and circulation of emotions therefore necessitates a profound revision of the theoretical paradigms through which we analyze subjectivity, intimacy and sociality. Contemporary affective infrastructures, which include digital architectures, recommendation algorithms, user interfaces and machine

learning models, actively produce the conditions of possibility for what is emotionally sayable, visible and monetizable (Paasonen, 2023; Coleman, 2025). These technologies do not merely function as a means of mediation; rather, they act as normative environments that prefigure and direct the construction of emotions themselves. This radical reinterpretation of the relationship between emotion and technology gives rise to inevitable ethical and political questions. On the one hand, it engenders new opportunities for affective expression, empathic connection and collective processing of emotional states. Conversely, it has been argued that this shift engenders novel forms of emotional surveillance, relational alienation and symbolic manipulation, whereby affective spontaneity is translated into a communication strategy, vulnerability becomes a computable resource, and intimacy is transformed into economic value (Marwick & Boyd, 2011; Berardi, 2009). Confronted with these challenges, there is an imperative to formulate a relational ethics that is commensurate with the emergent emotional infrastructures. This ethics is not confined to the establishment of limits on the technological manipulation of affectivity; rather, it is capable of conceptualizing intersubjective, plural and non-hierarchical relationships founded upon care, listening and mutual recognition (Butler, 2004; Ahmed, 2004). Such an ethic should guide

not only individual behavior but also technological design processes, pushing towards forms of affective design that restore dignity and complexity to the emotional experience. Finally, it should be emphasized that the construction of alternative affective futures cannot be conceived as a mere exercise in regulatory norm-setting, but as a collective process of critical imagination, in which theoretical reflection, political action and technological innovation are integrated into a shared vision of emotional justice. It is imperative to comprehend that this is the sole method through which digital environments can be engineered to genuinely accommodate, encourage and cherish the heterogeneity of emotional experiences, thereby circumventing the algorithmic reification of intimacy.

Limitations and Future perspectives

No original data were collected, and no systematic content analysis was conducted. However, the theoretical framework is supported and illustrated through the application of empirical insights derived from extant sociological and media studies. These studies include, but are not limited to, research on emotional labor, online behavior, and algorithmic dynamics. These references fulfill a purely contextual function and do not constitute primary data that was analyzed during the study. This contribution is a theoretical and critical reflection aimed at constructing

an interpretative framework for emotions in the context of digital capitalism. Future research could integrate qualitative methodologies to empirically verify the formulated conceptual hypotheses. A variety of methodologies have been employed to investigate the expression, coding, and negotiation of affective practices in digital communities. These methodologies include netnographic observation, semi-structured interviews with users and content creators, and analysis of emotional discourse on social media. These tools have proven to be particularly promising. The utilization of primary data would facilitate the validation and refinement of the concept of vital subsumption. Furthermore, it would inform the design of more inclusive and ethically aware digital environments. From this perspective, it is hoped that a convergence will be observed between theoretical innovation and situated observation, thereby strengthening the transformative potential of affect theory in the critical analysis of the platformization of emotions.

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Strategic Phototherapy: Individual and Couple Therapeutic Techniques

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Abstract

Strategic phototherapy uses photography as a transformative therapeutic tool, drawing on its evocative and reflective power to facilitate change in both individual and relational dynamics. This approach provides creative techniques to disrupt dysfunctional patterns, stimulate insights, and promote tangible, lasting changes through a corrective emotional experience, from a strategic perspective, that is, within a systemic-constructivist framework. Photography captures moments that become memories, but strategic phototherapy transforms them into something memorable. Techniques like paradoxical photography, where “blocked” situations are symbolically reinterpreted to inspire new perspectives, and narrative phototherapy, which reconstructs personal stories through a series of curated images, help patients to explore emotions, redefine their narratives, and encourage change. In couples therapy, photography symbolically represents conflicts, desires, and significant moments, creating a space for mutual understanding and the restructuring of relational narratives. An innovative example proposed in this work is the use of the photo booth, which provides an intimate and playful context for partners to visualize the progress and the potential of their relationship, thus encouraging deeper, more conscious communication. Through the incorporation of photographs in strategic prescriptions, this prospective work offers a methodological reflection on the clinical potential of strategic phototherapy as an effective operational tool to promote significant change in interpersonal dynamics and emotional processes and provides practical insights for future empirical validation.

Keywords: Strategic phototherapy, change, corrective emotional experience, paradoxical photography, photo booth, strategic prescriptions

Introduction

Photography was officially born in 1839 with the patent by Louis Jacques Mandé Daguerre (1787–1851), during the Second Industrial Revolution, which was rich in important inventions that changed not only our way of living but also our way of thinking (Daniel, 2004). Among the most significant innovations of the time were the automobile and electricity. Within this historical framework, photography progressively evolved, fully leveraging technological advancements to become one of the essential tools for social growth. Initially compared to painting, it gradually asserted its own artistic identity and, over time, became one of the most influential art forms. However, photography is much more than a mere technical tool for capturing images: it is a powerful and complex medium that intertwines art, memory, communication, and introspection—a visual language that surpasses cultural and linguistic boundaries. Each image conveys a visual message that can be interpreted differently depending on the observer's personal experience and context. Its accessibility, now amplified by smartphones and social media, has transformed the way we communicate. In the past, photographs were rare and symbolically rich objects, carefully preserved to pass on memories of important events. With technological progress and digitalization, the cost of photography

has decreased, and taking pictures has become increasingly routine and performative. However, this abundance has changed our relationship with images: from tangible and intimate objects, they have become often ephemeral digital memories, consumed quickly and by a vast, sometimes unknown, audience. Beyond its aesthetic value, photography holds strong evocative power. Roland Barthes (1980) introduced the concept of *punctum*, the most personal, intimate, and unpredictable element of a photograph—the part of the image that emotionally strikes the viewer—emphasizing how images operate on an emotional and symbolic level, becoming tools to explore one's inner world. According to authors such as Judy Weiser (2013) and Mastandrea (2011), the photographic image acts as a bridge between emotion, memory, and reflection, allowing access to deep contents that are difficult to express through verbal language alone. Photography, therefore, not only captures a moment but amplifies its meaning through the subjective filter of the observer. From a strategic perspective, it functions as a tool for change, making the invisible visible: emotions, roles, stories, and lived experiences can be narrated and transformed through the image. The very act of taking a photograph is already an intentional action that alters the perception of experience. In this sense, photography becomes a tool for

intervention—not merely for expression—enabling symbolic action on the Self and activating corrective experiences on a cognitive, emotional, and relational level.

Theoretical Framework: From Photography as Expression to Photography as a Therapeutic Strategy

In clinical settings, photography has historically been used to stimulate narration, evoke memories, or symbolically represent the patient's inner world. Numerous scientific studies show how photography is useful in processes of change and healing for patients suffering from eating disorders (Wessells, 2008), depressive and anxiety disorders (Seifert, 2014), obsessive-compulsive disorders (Mancini, 2006), and for empowerment (Levin et al., 2007). Methods such as *photovoice*, the use of family albums, or therapeutic self-portraits have been applied in various psychotherapeutic contexts. However, these tools remain predominantly exploratory and lack an operational structure aimed specifically at change. The strategic approach, derived from systemic-constructivist models, is based on the idea that the problem is not what happens, but how it is perceived and maintained through dysfunctional attempted solutions. From this perspective, photography is no longer used to "express" but to alter perception and generate new corrective

experiences, allowing the patient to see themselves and the world in a new way. Strategic Phototherapy emerges from this theoretical and operational integration, placing photography not as an object of analysis but as an active, experiential, and transformative intervention, structured within the therapeutic protocol.

Strategic Phototherapy: A New Clinical Methodology

The strategic approach, founded on the work of Paul Watzlawick and further developed by Giorgio Nardone (2015), is based on the idea that therapeutic change can occur through brief but profoundly impactful interventions. These are not focused on removing the cause of the problem, but on breaking the cycle of dysfunctional attempted solutions. The therapeutic techniques are tailored to the individual and aim to produce corrective emotional experiences capable of altering perceptions, emotions, and behaviors in a short period. Strategic phototherapy was developed with the intent to integrate the visual and symbolic dimension of photography into the strategic clinical intervention. In this context, photography is not merely a representation of the past but a simulation of a new possible reality, through which the patient can observe themselves from different perspectives, uncover rigidity, and activate new expressive

and experiential possibilities. Precisely because of its evocative and transformative power, certain prescriptive rules should be followed when using photography in strategic therapy. The first rule is that the photos used will not be seen by anyone outside the therapeutic context. This requirement removes the element of performance, as a photo taken without spontaneity often leads individuals to adopt poses or expressions they believe will make them more likable to others. Another important aspect is that all photos used in sessions—whether pre-existing or newly taken—must be printed. This is essential for the images to be tangible objects that can be touched, torn, or used to build collages in the construction of new narratives. Finally, it is preferable for the photos to remain with the patient. This is both for legal reasons (in case other people are visible in the photos and cannot sign a release form, or if the photos involve nudity or intimacy) and so that the patient can choose to keep them, destroy them, or finally disclose to someone (Scaringello, 2024).

Techniques of Strategic Phototherapy for Individual Therapy

Within individual therapy practice, specific techniques have been developed that integrate photography as an essential part of the therapeutic strategy. The operational core of

the approach consists of creating personalized photographic interventions, tailored to the type of problem and the phase of the therapeutic process. The photographic techniques follow the logic of strategic prescriptions, that is, concrete actions designed to disrupt perceptual patterns and promote cognitive restructuring. The main techniques include:

Strategic Photo-Portrait: In this technique, the patient is invited to create a sequence of symbolic self-portraits representing different aspects of the self: the ideal self, the self perceived by others, the rejected self, and the authentic self. The goal is to produce a visual comparison between these perceived identities to break the crystallization of the self-image and facilitate the integration of denied or repressed parts. These self-portraits are then used in sessions to guide strategic reflections, trigger inner dialogues, and stimulate processes of transformative self-narration.

Paradoxical Photo: The therapist gives the patient a paradoxical prescription, which involves creating a specific photographic image with defined emotional and symbolic characteristics. For example, a patient stuck in a pattern of control might be asked to photograph themselves in a state of total disorder, with the goal of breaking the rigid perceptual-reactive system that maintains the problem.

Paradoxical Albums: The patient builds a photographic album containing images that

contradict their dysfunctional thoughts (e.g., a person who feels inadequate composes an album of personal successes). The collection acts as visual evidence that challenges self-limiting beliefs.

Narrative Phototherapy: The person tells a story using a sequence of photographs. The therapist helps identify dysfunctional patterns and rewrite the narrative in a more adaptive way.

Symbolic Representations of Success: Through photography, it is possible to create the representation of the person after change, helping them internalize this future state. For example, someone might create a photo collage that illustrates their goals or an ideal future life.

Paradoxical prescriptions, such as those described, work by disconfirming dysfunctional beliefs, interrupting the confirmation loop between perception and behavior. Photography not only symbolically represents the blockage but becomes an active tool for creating an alternative emotional experience. Visual confrontation, in fact, facilitates distancing from dysfunctional self-narratives and stimulates the reconstruction of a more integrated self-image.

The Photo Booth: A Therapeutic Space for Couples

The photo booth, reimagined as a therapeutic space, represents a unique tool in couple

therapy. It is a protected, enclosed environment rich in symbolic value: a place of intimacy, playfulness, but also of automatic repetition—just like in dysfunctional relationships. Entering the booth means posing together, negotiating shared space, and deciding how to present oneself to others. It becomes a powerful metaphor for relational dynamics within the couple, and the resulting images serve as tangible representations of these dynamics. The booth allows the couple to act concretely and symbolically on their relationship, breaking routine and promoting new perspectives. It offers a space for spontaneous and creative interaction, free from the pressure of a traditional therapeutic setting. The images produced can then be used to explore and represent aspects of the relationship that may be difficult to access through verbal dialogue. Each photo becomes a visual metaphor for relational dynamics, unspoken emotions, or untold stories that partners live daily. Each image can be reinterpreted and discussed by the therapist and the couple as a new narrative of the relationship—one that may replace or revise the existing one. The booth thus becomes a starting point for reconsidering how the couple tells their story, challenging limiting beliefs or dysfunctional roles, and evolving into a powerful therapeutic tool. With its physical and symbolic structure, the photo booth provides a unique setting that can be particularly

useful in therapy. It is a confined and intimate space where the couple is invited to share moments of closeness, express themselves through poses and facial expressions, and interact in an unfamiliar way. This shared experience, captured in instantly viewable photos, becomes an opportunity to explore the relationship, highlighting both strengths and challenges. By entering the booth and choosing how to pose, the couple can explore and reinterpret their relational dynamics, gain new perspectives on their interaction, and stimulate change in communication and behavior. The booth offers an opportunity to decode and restructure the couple's narrative, fostering the creation of new stories, new roles, and, most importantly, new solutions. In a strategic therapeutic context—where the goal is practical and functional change—photography becomes a tangible strategy to transform the vision of the relationship, helping the couple see themselves and each other in a new, more positive and constructive light. A model of intervention will be proposed below.

The Booth Protocol

The intervention follows a series of clearly defined phases:

Phase 1: Free Shot

The couple enters the booth and takes a sequence of photo strips without any instructions, revealing the spontaneity (or rigidity) of their interaction.

Phase 2: Thematic photographic prescription

The couple is asked to embody different emotions or situations: “take a photo as lovers,” “one as if you're angry,” “one as parents”. This exercise is designed to explore the roles they take on in the relationship and to observe how flexible—or stereotyped—those representations are.

Phase 3: Strategic Review

The photos are analyzed together in session, highlighting relational patterns, repetitive scripts, and potential transformation points.

Phase 4: Photographic restructuring

The couple is given a symbolic photographic assignment to complete outside the therapy room. The goal is to break dysfunctional relational patterns or introduce new modes of emotional connection.

It is important to emphasize that this protocol should not be understood as a rigid and standardized model, but rather as a flexible guideline to be adapted to the specific characteristics, needs, and dynamics of the couple. Each phase can be modified, omitted, or explored thoroughly depending on the therapeutic context and the goals of the intervention, always keeping in mind the centrality of the subjective experience and the importance of supporting each partner's evolutionary process within the relationship.

Clinical Benefits

Using the photo booth helps stimulate non-verbal communication: the expressions, postures, and interactions captured in the photo strips offer a valuable opportunity to explore these aspects. Moreover, the photographs become a form of documentation of the therapeutic journey and can serve as a relational mirror during moments of crisis or stagnation. The booth is a neutral and protected space, distant from everyday dynamics. Here, the couple can experiment with new ways of relating without external pressures. The printed images also provide instant visual feedback. The couple can reflect on what emerges from the photos, discussing the emotions and meanings they evoke. Through these images, difficult topics can be approached indirectly but effectively, using photography as a catalyst for dialogue. The couple can take photos that symbolically represent the problems they are facing and then discuss them during the session to identify the steps needed to overcome the barriers. These images can also be used to capture the couple's spontaneous interactions, offering a starting point for reflection on roles, emotional distance, intimacy, or tension (who led the interaction? Who followed?). Another benefit of this tool is the rediscovery of playfulness and lightness. In many distressed relationships, play and complicity are sacrificed to conflict or daily stress. The photo booth, with its playful aspect, of-

fers an opportunity to rediscover the joy of doing something together. Even in couple therapy, photos can be used to symbolically represent the process of change. For instance, the couple can take two series of photo strips: one representing their current state, and another portraying what they hope to become together. Finally, the booth can be used to document significant moments of the therapeutic journey. Each photo can represent a milestone, helping the couple visualize the progress made.

Clinical Example: Marco and Luisa

A concrete example of the effectiveness of the photo booth as a therapeutic tool comes from the case of Marco (45 years old) and Luisa (42 years old), who have two young children and are married since ten years. The couple entered therapy during a period of emotional disengagement, marked by frequent arguments and Luisa's perception of being emotionally neglected. She complained about a lack of attention and closeness, while Marco described an exhausting work situation and financial difficulties that made him less emotionally available. After an initial phase of exploring their dynamics, the couple was assigned a cycle of tasks aimed at rekindling mutual care and symbolic courtship, including the photo booth experience. The task involved going together to a booth to

take a series of spontaneous photos, followed by themed shots (e.g. “a photo as lovers,” “a photo representing a happy moment from the past”). In the following session, the couple reported—somewhat to their surprise—that the experience had been unexpectedly intimate and fun. Together with the therapist, they analyzed the photos, exploring how they were seated, their physical closeness or distance, facial expressions, eye contact, and most importantly, the feelings experienced during the shoot. This led to the emergence of shared positive memories and a renewed emotional closeness that had been absent for some time. The photo booth experience was then prescribed again, with new symbolic prompts, this time aimed at visually representing the “couple they wish to become”. In subsequent sessions, the images were used to highlight observed changes, renewed emotional intentionality, and the possibility of constructing a new narrative of their relationship.

Limitations of the Approach

Despite its observed effectiveness in clinical practice, strategic phototherapy presents several methodological limitations. First and foremost, the lack of structured empirical studies limits the potential for scientific validation of the approach. Additionally, the effectiveness of the techniques relies heavily on

the subjectivity of the individual and the relational context with the therapist, making replicability challenging. Caution is also necessary when using images, as they may evoke traumatic content or be interpreted defensively if not adequately contextualized within the therapeutic process.

Discussion

As described in this brief overview, the use of photography in individual and couple therapy can prove to be a valuable tool for fostering introspection, communication, and emotional connection. The ability of images to evoke memories, emotions, and personal meanings allows individuals to explore aspects of their identity and relationships in a creative and non-verbal way. In individual therapy, photography allows one to explore one’s own identity, to reinterpret past experiences, and to construct new narratives that support self-understanding and self-acceptance. In couple settings, it can amplify mutual understanding, stimulate dialogue, and strengthen the emotional bond. The innovative approach of phototherapy, by combining art and psychology, shows how photography can overcome communication barriers, promoting processes of change and personal growth. It also encourages an experiential dimension that helps individuals and couples see themselves and others in a new light, facilitating the development of greater awareness and

change strategies. Despite the undoubtedly promising foundations, further investigation into the topic is considered necessary. A concrete proposal for future research could involve the design of a qualitative and quantitative study based on multiple clinical cases documenting the therapeutic process of couples and individuals treated with strategic phototherapy techniques. This study should specifically evaluate the perceived effectiveness of the intervention, changes in relational and emotional processes, the therapeutic alliance, and outcomes in terms of symptom reduction and increased subjective well-being.

It would be advisable to adopt pre- and post-treatment assessment tools to ensure systematic data collection and to support the empirical validation of the approach. This would not only strengthen the scientific foundation of the model but also allow for the development of more clearly defined operational guidelines, promoting the ethical, effective, and replicable use of strategic phototherapy in clinical practice.

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Attachment and Abusive Relationships: State of the art and future perspectives in health promotion. A bibliometric review

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Abstract

Relationships serve as a protective factor for health. Psychological literature suggests that the degree of relationship satisfaction at age 50 is a more accurate predictor of health outcomes at age 80 than cortisol levels. The quality of relationships built over a lifetime is influenced by attachment patterns developed in childhood. Dysfunctional attachment may be associated with problematic relationship dynamics. This research examines the intersection of attachment and abusive relationships by identifying major trends, emerging themes, and existing gaps within the literature. A bibliometric and visual analysis was conducted using R/bibliometrix and R/biblioshiny to provide an overview of the current academic landscape. A total of 291 articles published from 1993 to 2025 were retrieved from the Web of Science database. The analysis considered publication trends, authors, contributing countries, institutions, journals, and key research topics. Results suggest that the number of studies examining the link between attachment and abusive relationships has increased over time, while topics such as emotions and adolescents have become more prominent in recent years. Keywords related to resources and health promotion have remained peripheral compared to those associated with risk factors and critical issues. Future research should focus more on health promotion and prevention strategies to develop more effective interventions. Future research should not only deepen the understanding of these dynamics but also promote preventive approaches aimed at fostering secure attachment early on. This may play a crucial role in reducing dysfunctional relational dynamics and promoting healthier couple relationships across the lifespan.

Keywords: Attachment theory, abusive relationships, intimate partner violence, health promotion, bibliometric analysis

Introduction

Healthy interpersonal interactions are acknowledged in scientific literature as a protective factor for both mental and physical health throughout life (Camilo et al., 2024; Forcadell-Díez et al., 2023). According to Smith (2010), there is evidence that fostering strong social bonds is associated with a lower risk of morbidity and mortality, as well as increased psychological resilience and overall life satisfaction. For instance, studies in psychology have shown that relationship satisfaction at midlife can more accurately predict positive health outcomes later in life than conventional biological indicators such as cortisol levels (Robles et al., 2014; Seeman et al., 2011).

It should be noted, however, that despite the large number of studies already published, the literature on attachment and relationship outcomes remains fragmented across disciplines, partly due to the use of methodologies and theoretical approaches that lack internal consistency, which ultimately hinder an integrated understanding. Ultimately, such fragmentation complicates efforts to identify universal models or design comprehensive intervention strategies.

The origin of relational dynamics lies in the fundamental role played by early attachment patterns, which shape the quality of interper-

sonal relationships throughout life. Attachment models are key to the development of Internal Working Models (IWMs), which are the mental representations of the self and others that shape relational expectations and behaviors (Bowlby, 1969, 1988; Mikulincer & Shaver, 2016). Mary Ainsworth identified three attachment patterns: secure, anxious-avoidant, and anxious/ambivalent. Main and Solomon (1986, 1990) added a fourth pattern, disorganized/disoriented attachment, characterized by contradictory behaviors, reflecting unresolved fear or confusion (Ainsworth et al., 2015). Attachment patterns are not static: they emerge during infancy and tend to stabilize toward the end of the first year of life; however, early attachment experiences are those that exert the greatest and most lasting influence on emotional development and functioning in adult relationships (McConnell & Moss, 2011; Mikulincer & Shaver, 2016). Insecure attachment patterns can manifest in romantic relationships through an excessive need for reassurance, fear of abandonment, or an inability to tolerate closeness; these are behaviors that can undermine relationships and eventually lead to relationship instability.

A substantial body of research relates insecure attachment styles to the perpetration and victimization of intimate partner violence (IPV; see Condino et al., 2022; Molero et al.,

2017; Velotti et al., 2022). Disorganized attachment is commonly associated with perceived confusion about love and safety, sometimes resulting in a simultaneous desire and fear of intimacy. In addition to this, dysfunctional attachment patterns can predispose individuals to problematic relationship dynamics, including abusive relationships (Dutton, 1998; Simpson & Rholes, 1994; Bartholomew & Allison, 2006; Dumas et al., 2008; Shaver & Mikulincer, 2011; Wilson et al., 2013). Individuals with attachment-related-vulnerabilities may be at risk of perpetuating cycles of abuse. Walker's Cycle of abuse (2009) describes three phases in intimate partner abuse: tension building, acute battering incident and honeymoon phase. Relational dynamics between partners, often referred to as matching, should also be considered. For example, the combination of an anxious attachment style in women and a fearful attachment style in men is more frequently associated with abusive and mutually harmful behaviors. Violence in these dynamics often serves as an attempt to draw the partner closer, thereby restoring a sense of security threatened by fears of separation and abandonment (Figure 1). Despite the clinical relevance of these findings, research explicitly addressing preventive interventions remains surprisingly limited. Although some programs grounded in attachment theory have shown

promise in reducing relational distress and intimate partner violence, such studies are relatively few and often lack longitudinal validation. The scarcity of integrated, attachment-based prevention models highlights a gap between theoretical insights and practical applications, underscoring the need for more systematic research in this area. Available data on the number of research studies on the intersection of attachment and abusive relationships indicate a growing interest, despite a research landscape that appears fragmented. The heterogeneity of methodological approaches and theoretical frameworks employed has, to some extent, limited the integration of findings and complicated the identification of general trends and critical gaps in knowledge. Recent work regarding attachment, relationships and intimate partner violence (IPV, defined by the World Health Organization – WHO- as “any behavior within an intimate relationship that causes physical, psychological or sexual harm to the persons involved in the relationship”) includes the systematic review by Velotti et al. (2018), a 2022 meta-analysis focused on perpetrators (Ibid.) and a meta-analysis by Stefania et al. (2023) focused on victims of abuse.

Such fragmentation makes it difficult to obtain, and subsequently analyze, a coherent and comprehensive overview of the field. Bibliometric analysis serves as a valuable tool for objectively and systematically mapping the

development of the literature. This method makes it possible to identify publication trends and thematic networks, thereby providing a structured overview. Given the above, the present study proposes an updated bibliometric and visual analysis of the literature on attachment and abusive relationships, covering the period up to February 2025. covering the period up to February 2025. The authors aim to pursue two main goals: first, to identify dominant trends, emerging themes, and gaps in knowledge; and second, to offer evidence-based insights to inform both theoretical refinement and relational health promotion strategies.

Materials and Methods

Data source and retrieval strategy

A comprehensive and systematic search was conducted on February 12, 2025, using the Web of Science (WoS) online database, one of the most frequently used databases for bibliometric analysis. WoS was selected as the sole database for this bibliometric analysis due to its high-quality indexing standards and comprehensive coverage of peer-reviewed journals across the social sciences and psychology. Compared to other databases, WoS provides robust citation data and facilitates consistent export formats required for bibliometric tools such as VOSviewer and Bibliometrix (Birkle et al., 2020; Šubelj, 2014). The database search was limited to a single

day to avoid potential bias from frequent database updates. The time span for the database search covered all available years in WoS up to the search date (i.e., from 1900 to 2025), without any restriction by publication year, to ensure a comprehensive retrieval of relevant literature.

Inclusion criteria

The search query included the following terms: ("adult attachment" OR "attachment theory" OR "secure attachment" OR "anxious attachment" OR "avoidant attachment" OR "disorganized attachment") AND ("abusive relationships" OR "domestic violence" OR "intimate partner violence" OR "psychological abuse"). These terms were applied to the titles, abstracts, and keywords of indexed publications.

The retrieved data were exported in BibTeX format, including key bibliographic information such as article titles, author names and affiliations, abstracts, keywords, journal names, and citation metrics.

Statistical methods

The bibliometric analysis was conducted using the open-source software RStudio (version 4.3.1), employing the R packages *bibliometrix* and its web interface *biblioshiny* (Aria & Cuccurullo, 2017), which are specifically developed for comprehensive science mapping and bibliometric analysis.

The dataset, retrieved from the Web of Science in BibTeX format, was imported and converted into a bibliometric data frame.

Basic performance indicators, including total number of publications, annual scientific production, document average age, average citations per document, and authorship metrics (e.g., h-index, g-index, m-index), were computed. The most prolific journals and authors were identified through frequency and impact metrics. Country productivity was analyzed based on corresponding author affiliations. Author collaboration networks and keyword co-occurrence networks were constructed and visualized.

Results

Descriptive statistics

Table 1 presents data from the WoS database. The collection includes 291 documents published between 1993 and February 2025, with an annual growth rate of 4.43%. The earliest records date back to 1993, thus defining the 1993–2025 timespan. This overview provides baseline descriptive indicators of the analyzed literature.

Table 1

Annual output and growth trend of publications

The annual volume of literature is a crucial metric that reflects the current state of research within a given field. In this study, to

provide a general perspective on the level of interest and development in this area of study, we conducted an analysis of the entire body of papers indexed in WoS, covering the period from Jan. 1, 2013, to Feb. 12, 2025. The data were compiled and presented in the form of a bar graph (Figure 2), which effectively conveys an overview of the research landscape's status.

Figure 2

Most relevant authors

Table 2 and Figure 3 present the main authors who contributed to research papers relating abusive relationships to attachment; a total of 812 authors contributed across 291 papers.

In bibliometric research, various indicators are commonly employed to assess authors' scientific impact, combining measures of productivity and citation influence. Popular metrics include the h-index, g-index, and m-index, each offering a distinct perspective on academic performance. The h-index balances productivity and citation impact, favoring authors with a consistent publication record over time. The g-index emphasizes highly cited articles, giving greater prominence to researchers who have produced fewer papers of exceptional impact. Lastly, the m-index normalizes the h-index by the number of years since an author's first publication, enabling a fairer comparison between early-career and senior researchers (Gurnani & Kaur, 2021).

Table 2**Analysis of the sources: most relevant journals**

The Web of Science database identified 142 journals publishing a total of 291 papers. The top ten journals with the highest number of publications on abusive relationships related to attachment are as follows: Journal of Interpersonal Violence (37 articles); Journal of Family Violence (24 articles); Partner Abuse (10 articles); Violence and Victims (8 articles); Trauma, Violence, & Abuse (7 articles); Journal of Marital and Family Therapy (6 articles); Aggression and Violent Behavior (5 articles); Child Abuse & Neglect (5 articles); Development and Psychopathology (5 articles); and Frontiers in Psychology (5 articles).

Bibliometric analysis of countries

A total of 42 countries contributed to this scientific production. The most prolific countries are the United States with 118 articles, followed by Canada with 36, the United Kingdom with 19, Australia and Italy each with 17, Spain with 14, France with 6, and Belgium with 5. Generally, Australia, North America, and Western Europe have produced most publications on these issues, while there are considerably fewer studies from Asia and South America, and very few from Africa.

Thematic map

The thematic map revealed several semantic clusters positioned along two key axes. The

“centrality/relevance axis” measures the extent to which a cluster is connected to others, indicating the strategic importance of a theme within the overall structure of the literature. The “density/development axis” reflects the internal cohesion of a cluster, indicating its level of theoretical development.

Basic Themes (low density, high centrality) include concepts such as adult attachment, intimate partner violence, abuse, and mental health. These themes are central to the field but still require further theoretical refinement. In contrast, Motor Themes (high density, high centrality)—including infant attachment, children, substance use, and family of origin—are both well-established and highly interconnected, forming the theoretical and empirical core of research on attachment and family dynamics.

Niche Themes (high density, low centrality) highlight well-developed but more peripheral areas of inquiry, such as studies on fathers, interparental conflict, and African American families. Finally, Emerging or Declining Themes (low density, low centrality), including validation, attachment theory, and validity, suggest a relatively limited and possibly declining interest in methodological or foundational theoretical issues (Figure 3 and Table 3).

Figure 3**Table 3**

Centrality is based on the sum of co-occurrences (links) between the keywords of a cluster and those of other clusters. It measures external connection. If a cluster contains keywords that frequently co-occur with keywords from other clusters, it has high centrality.

Density is based on the sum of co-occurrences among keywords within the same cluster. It measures internal connection. If the keywords in a cluster frequently co-occur with each other, the cluster has high density. Frequency refers to the total number of occurrences of the keywords within a given cluster in the analyzed literature. It indicates the overall prominence or attention that the theme represented by the cluster receives in the research field. Higher frequency suggests that the topic is widely discussed or studied across the body of literature.

Co-occurrence network

The keyword co-occurrence network reveals two main thematic clusters. The first cluster focuses on concepts such as adult attachment, intimate partner violence, abuse, domestic violence, and behavior. These keywords exhibit high values of betweenness, indicating the frequency with which a keyword serves as a bridge between different subject areas, and PageRank, a measure reflecting the overall importance of a keyword within the co-occurrence network, thereby highlighting their central role in linking diverse strands of

literature. Adult attachment shows the highest betweenness value (218.20), confirming its function as a primary semantic "node" within the field.

The second cluster (Cluster 2) is characterized by keywords including mental health, trauma, depression, symptoms, and post-traumatic stress disorder. These terms represent a preeminent clinical and diagnostic orientation focused on the psychopathological consequences of abuse.

Overall, the co-word network reveals a literature structured around two main axes: First, the relational dynamics involving attachment and violence; second, the impact of such experiences on victims' mental health (Figure 4 and Table 4).

Figure 4

Table 4

Discussion

The bibliometric analysis showed a steady growth in scientific production on the topic of attachment and abusive relationships from 1993 to 2025, with an average annual growth rate of 4.43%. This increase confirms the growing interest of the scientific community in understanding the relational mechanisms underlying abusive dynamics, consistent with the consolidation of theoretical models that position adult attachment as a predisposing factor in dysfunctional intimate relationships (Mikulincer & Shaver, 2016). The thematic

clusters identified through word analysis suggest a field structured around two main axes. The first axis focuses on relational constructs, particularly adult attachment, intimate partner violence, and abuse, highlighting the significant relevance of attachment theory in explaining risk factors for relational dysfunction. In contrast, the second axis centers on clinical consequences, focusing on mental health outcomes such as depression, PTSD, and dissociative symptoms. Notably, terms related to health promotion and preventive frameworks occupy a relatively peripheral position in both the thematic map and the keyword network. This imbalance may indicate that the field is predominantly reactive, emphasizing risk identification and post-trauma intervention. At the same time, proactive approaches aimed at fostering safe relational environments before violence occurs are largely neglected.

This gap is particularly critical in light of interdisciplinary research showing that early relational adversity—such as inconsistent caregiving, attachment breakdown, or exposure to domestic violence—affects biological stress systems and mental health, causing long-term effects (Berens et al., 2017). Although this evidence is well known, attachment-based preventive interventions remain underrepresented in the field.

Among the most promising intervention models are the Nurse-Family Partnership (Olds,

1997) and relational interventions for high-risk families (Narayan et al., 2019), which have demonstrated how providing early support to caregivers can interrupt intergenerational cycles of neglect and abuse. Similarly, attachment-based therapeutic approaches such as mentalization-based treatment (Bateman & Fonagy, 2004; Malda-Castillo et al., 2019) offer valuable tools useful both for clinical populations and for adaptation in community-based preventive settings.

While interventions aimed at early childhood have been emphasized, more attention should also be devoted to attachment-based approaches for adult couples, particularly in the contexts of relationship education, couples therapy, and violence prevention programs. Interventions focusing on strengthening emotional attunement, communication, and secure bonding in adult romantic relationships have shown encouraging results in reducing conflict escalation and improving relational resilience (Johnson, 2019; Simpson & Rholes, 2012). Embedding such interventions within broader health promotion contexts could help couples avoid entering patterns of abuse, especially when exposed to high-stress environments or life transitions.

Another factor that may contribute to the paucity of health promotion literature is disciplinary silos, where attachment theory is primarily studied within clinical psychology, while violence prevention and early intervention are

predominantly investigated in social work and public health. Bridging these fields could lead to multisystem interventions targeting both risk reduction and relational resilience.

Future research should prioritize integrative approaches that go beyond post-abuse treatment by exploring the preventive potential of attachment theory. Programs that focus on early caregiving, parental sensitivity, and emotional regulation could serve not only clinical purposes but also broader public health goals, thus aligning with calls for upstream strategies to mitigate relational violence and promote mental well-being.

Limitations and Future perspectives

The present analysis has several limitations. First, it was restricted to a single database, Web of Science, thus excluding potentially relevant sources indexed in databases such as Scopus, PubMed, or PsycINFO. Second, no co-citation or bibliographic coupling analyses were performed, which would have enabled a more nuanced reconstruction of schools of thought and author networks. Moreover, limiting the dataset to English-language publications may have excluded significant contributions from non-English sources.

Another limitation lies in the exclusive reliance on quantitative bibliometric methods. While these techniques are effective in mapping the structural and thematic organization of the literature, they do not account for the

interpretive depth that qualitative approaches can provide. The absence of methodological triangulation might limit the richness of the thematic interpretations.

This bibliometric review aimed to map the evolving research landscape at the intersection of attachment theory and abusive relationships, highlighting key trends, central concepts, and thematic gaps.

The data indicate that the literature has grown steadily and consolidated the centrality of adult attachment as a risk factor in dysfunctional relationships. However, the focus remains predominantly on clinical outcomes and posttraumatic responses. Concepts related to prevention, resilience, and health promotion remain marginal, revealing a gap in the proactive application of attachment theory.

Beyond highlighting this imbalance, this paper advocates for a paradigm shift from reactive approaches to preventive strategies, and from an emphasis on pathology to one on protection.

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Wilson, J. B., Gardner, B. C., Brosi, M. W., Topham, G. L., & Busby, D. M. (2013). Dyadic adult attachment style and aggression within romantic relationships. *Journal of Couple & Relationship Therapy*, 12(2), 186-205. <https://doi.org/10.1080/15332691.2013.779185>

Figure. 1 Relationship between attachment and intimate partner violence (IPV)

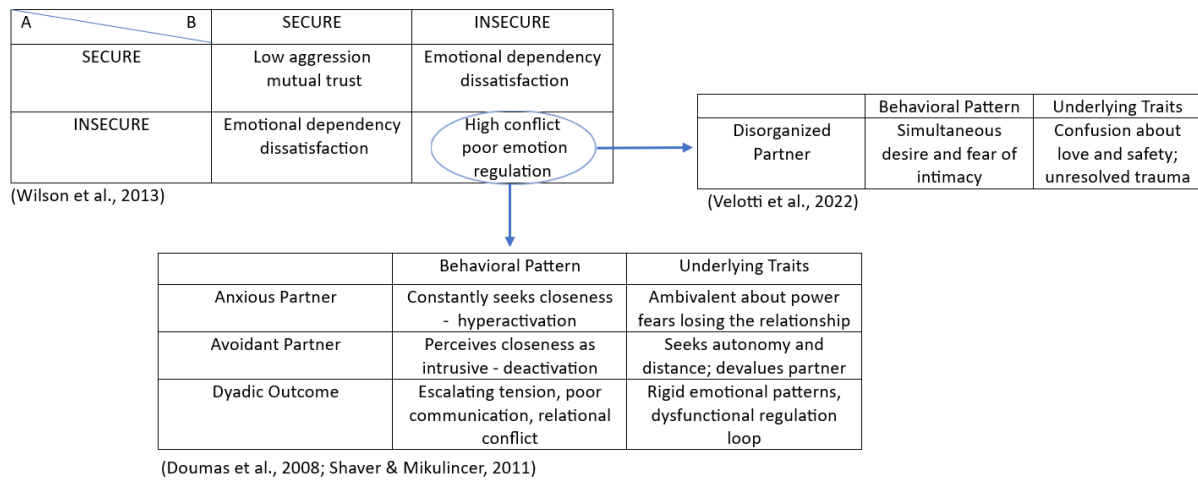


Table. 1 Descriptive statistic

Main Information About Data	Value
Timespan	1993 - 2025
Sources (Journals, Books, etc)	142
Documents	291
Annual Growth Rate %	4.43
Document Average Age	7.8
Average Citations per Document	23.68
Average Citations per Year per Doc	2.283

Figure. 2 Annual volume of literature

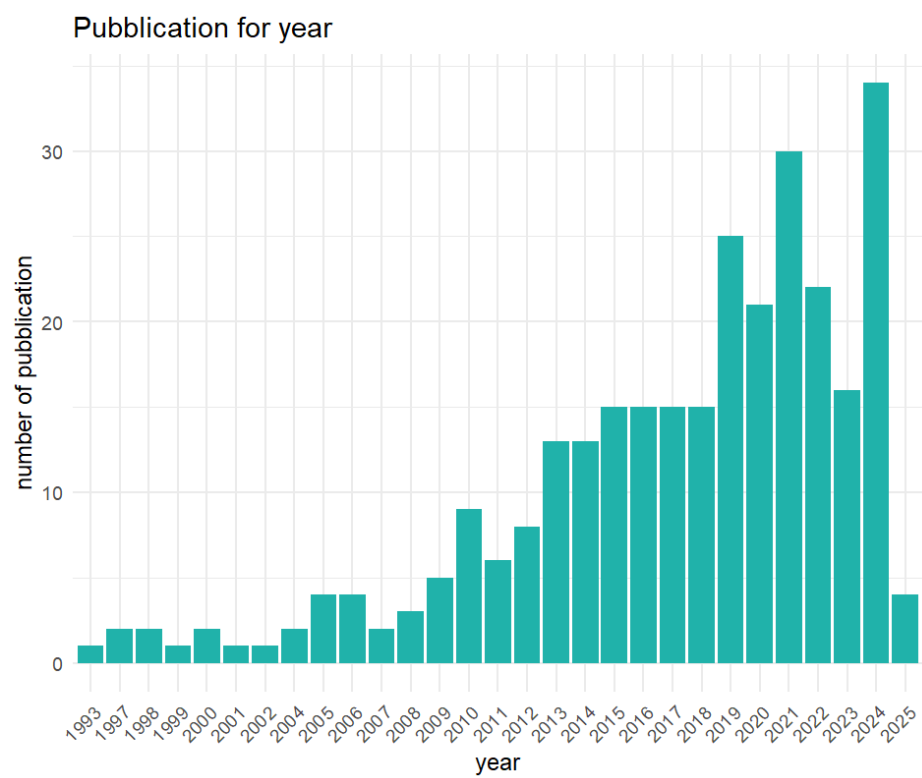


Table. 2 Most relevant authors

Author	h_index	g_index	m_index	Total Citations	Number Publications	Publication Year start
Brassard A.	5	8	0.333	162	8	2011
Godbout N.	5	7	0.294	216	7	2009
Lafontaine M.F.	5	6	0.5	61	6	2016
Bogat G.A.	4	4	0.182	238	4	2004
Dugal C.	4	5	0.364	58	5	2015
Levendosky A.A.	4	5	0.182	268	5	2004
Lopez F.G.	4	4	0.235	146	4	2009
Peloquin K.	4	6	0.333	63	6	2014
Sandberg D.A.	4	4	0.25	87	4	2010
Dayton C.J.	3	3	0.188	163	3	2010

Figure. 3 Thematic maps

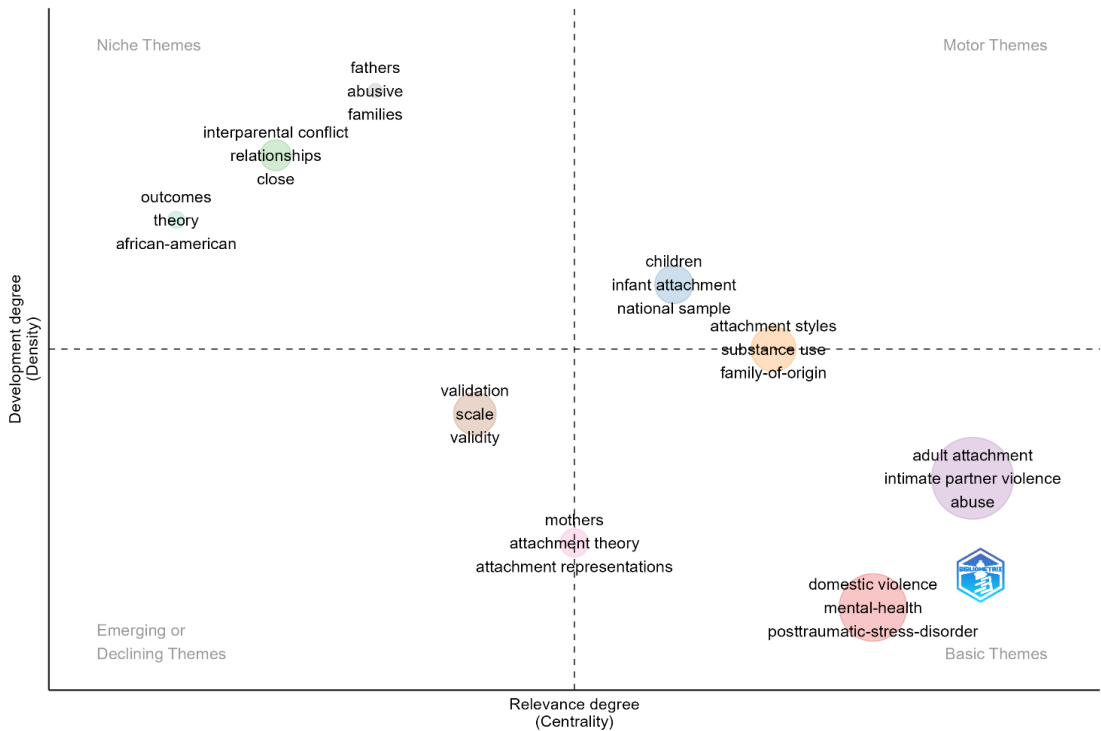


Table. 3 Bibliometric Indicators of the Thematic Map: Centrality, Density, and Frequency

Cluster	Callon Centrality	Callon Density	Rank Centrality	Rank Density	Cluster Frequency
domestic violence	15,16	42,07	8	1	454
children	3,32	58,63	6	6	53
interparental conflict	0,4	75	2	8	31
adult attachment	22,61	48,93	9	3	1296
attachment styles	3,42	57,98	7	5	86
validation	1,91	49,02	4	4	72
mothers	2,03	43,91	5	2	25
fathers	0,67	77,08	3	9	9
outcomes	0,33	62,5	1	7	11

Figure. 4 Co-occurrence network of keywords

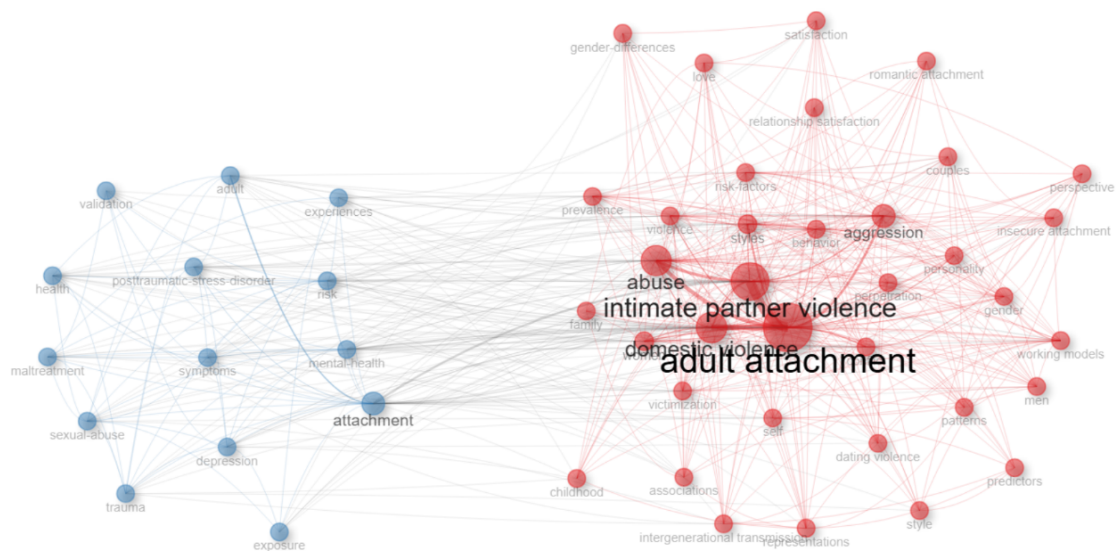


Table. 4 Bibliometric Indicators of the Thematic Map: Betweenness, Closeness, and PageRank

Node	Cluster	Betweenness	Closeness	PageRank
adult attachment	1	218,202	0,019	0,091
intimate partner violence	1	109,234	0,019	0,067
domestic violence	1	81,102	0,020	0,055
abuse	1	66,756	0,018	0,055
aggression	1	36,815	0,016	0,039
women	1	10,145	0,014	0,028
styles	1	11,963	0,015	0,030
violence	1	7,651	0,014	0,022
conflict	1	13,823	0,015	0,026
behavior	1	10,908	0,015	0,025
risk-factors	1	3,591	0,014	0,020
working models	1	6,697	0,014	0,022
prevalence	1	7,018	0,014	0,020
victimization	1	5,106	0,014	0,020
gender	1	2,192	0,014	0,017
self	1	2,716	0,013	0,013
insecure attachment	1	1,633	0,013	0,016
perpetration	1	6,071	0,014	0,019
personality	1	0,747	0,013	0,014
intergenerational transmission	1	1,643	0,012	0,012
representations	1	1,317	0,012	0,011
childhood	1	0,798	0,012	0,010
couples	1	0,962	0,013	0,014
men	1	0,641	0,013	0,013
dating violence	1	0,863	0,012	0,011
love	1	0,904	0,012	0,011
patterns	1	1,476	0,012	0,013
style	1	0,784	0,011	0,010

associations	1	0,946	0,012	0,011
predictors	1	0,421	0,011	0,008
romantic attachment	1	0,269	0,012	0,011
family	1	0,452	0,011	0,009
gender-differences	1	0,221	0,012	0,010
perspective	1	0,656	0,012	0,010
relationship satisfaction	1	0,167	0,012	0,010
satisfaction	1	0,539	0,012	0,010
attachment	2	30,496	0,016	0,037
mental-health	2	4,744	0,014	0,022
risk	2	7,155	0,014	0,022
posttraumatic-stress-disorder	2	2,419	0,013	0,017
adult	2	1,300	0,012	0,015
sexual-abuse	2	2,581	0,013	0,013
symptoms	2	2,190	0,013	0,014
experiences	2	1,332	0,012	0,013
maltreatment	2	2,432	0,012	0,013
depression	2	3,730	0,012	0,012
health	2	2,941	0,013	0,014
trauma	2	1,584	0,012	0,011
validation	2	0,289	0,011	0,008
exposure	2	0,380	0,011	0,008

The Cognitive and Psychological Resilience of Intelligence Analysts in the Age of Artificial Intelligence: Morphological Analysis, Future Scenarios to 2030, and Neurobiological Perspectives

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Abstract

The advent of artificial intelligence (AI) has radically transformed the operational landscape of intelligence, posing complex challenges to analysts, cognitive and psychological resilience. These challenges arise from AI's capacity to psychometrically profile analysts using advanced behavioral and cognitive algorithms, predicting and potentially manipulating their decision-making processes. Information behavior aims to understand human behavior related to the search, retrieval, and use of information. It is based in research paradigms such as psychology, sociology and education. Furthermore, human-AI interaction creates long-term cascading effects on analytical quality through short and long-term neurobiological mechanisms. This theoretical-conceptual study adopts General Morphological Analysis (GMA), combined with Parsons, Kruijt, and Fox's cognitive resilience model and other neurobiological concepts well known, to assess in detail the interconnections among technological, cognitive, organizational and neurobiological factors. The analysis explores possible configurations focusing on AI-human analytical interactions through systematic scenario development. Three primary scenarios emerge: AI dominance, balanced collaboration, and human-centric separation; balanced collaboration is identified as optimal. A backcasting roadmap with specific milestones from 2025 to 2030 is proposed to guide implementation.

Keywords: Artificial intelligence, cognitive resilience, psychological resilience, intelligence analysis, general morphological analysis, neurobiology, 2030 scenarios

Introduction

Five main phases compose traditional intelligence: Planning and direction, collection, processing, analysis, dissemination. Thus phases combined to organizational factors such as structure and philosophy, communication strategies, team resources and administrative support play a crucial role for the success of information system implementation (Yeoh & Popovic 2016).

The integration of artificial intelligence into intelligence processes represents a revolution that has deeply altered how analysts collect, process, and interpret information. This transformation unfolds across three key dimensions, each redefining the analyst's role and their relationship with technology: (1) large-scale data processing, (2) advanced predictive support, and (3) intelligent automation of processes. However, we must remember that consistent research suggest that AI and algorithms should be used cautiously as this may lead to algorithmic/automation bias (Labib et al 2021)

Modern AI systems can analyze terabytes of data—such as satellite imagery, social media posts, and financial transactions—in near real-time, identifying correlations (e.g., a terrorist network through metadata analysis) that would take human teams months.

This technological shift introduces significant cognitive and psychological challenges

Among these, cognitive manipulation, information overload, and technological dependence intertwine with neurobiological implications such as dopamine-driven stress and the amplified cognitive biases (Glickman & Sharot, 2023).

Research Question: How can resilience be preserved and enhanced in the face of increasing AI autonomy and complexity through 2030?

Study Objectives: This study aims to: (1) map the multidimensional interactions between AI systems and analyst, neurocognitive and psychological resilience, (2) identify optimal configurations for human-AI collaboration, (3) develop actionable scenarios for organizational adaptation, and (4) provide a roadmap for maintaining analytical quality while integrating advanced AI capabilities.

Contribution to Literature: This research contributes to the emerging field of human-AI interaction in high-stakes environments by integrating cognitive resilience theory with morphological analysis methodology, offering both theoretical insights and practical frameworks for intelligence organizations navigating AI integration.

While the language remains academic, examples such as the rapid detection of a cyber threat using AI versus manual analysis (10 minutes vs. hours) are included to enhance accessibility for non-experts in intelligence or neuroscience.

To our knowledge, this is the first study to combine MGA with neurobiological aspects in assessing the interaction between AI and intelligence analysts, and it is the first to evaluate the theoretical interventions to be implemented by 2030 to make the most of the AI-human interaction. The next step is the longitudinal study to validate in the field what we have endorsed at a theoretical level.

Transformation of the Operational Landscape

The integration of artificial intelligence into intelligence processes represents a revolution that has profoundly changed the way analysts collect, process, and interpret information.

This change is articulated through three fundamental dimensions, each of which redefines the role of the analyst and his or her relationship with technology:

-Large-scale data processing:

Modern AI systems are capable of processing massive amounts of data - terabytes or even petabytes – in real or near-real time. For example, an AI system could simultaneously analyze streams of data from wiretaps, satellite images, social media posts and financial transactions, identifying correlations that a human analyst could not pick up without weeks of manual work. This capability relies on machine learning algorithms that recognize complex patterns, such as the suspi-

cious behavior of an individual that only emerges from the intersection of heterogeneous sources (text, images, numerical data). A case in point might be the identification of a terrorist network through the analysis of phone metadata and bank movements, a task that the AI completes in hours while a human team would take months.

Open Source Intelligence (OSINT) is the most common source of intelligence that uses AI.

OSINT is the practice of gathering, analyzing, and disseminating information from publicly available sources to produce actionable intelligence.

An example outside of state intelligence services is that of a group of scholars who used advances in news sensors and artificial intelligence to generate detailed maps of global threats

In three months their autonomous system processed 22 k news from all possible major social media sites, Government websites of 192 countries and 2397 connected news sources such as BBC, CNN, NY Times, The research discloses attractive news and global threat-maps with trusted overall classification accuracy (Sufi et al. 2022).

-Advanced predictive support: AI-based predictive models do not simply extrapolate linear trends from historical data, as old statistical systems did. Today, these models incorporate multivariate analyses that take into account a wide range of contextual variables:

geopolitical conditions, economic variations, weather events, even collective moods inferred from social media.

For example, an AI system might predict an insurgency in a region by combining data on unemployment, posts on platforms such as X expressing anger, and reports of troop movements. The result are detailed probabilistic scenarios, with specific probability percentages for each outcome (e.g., “60 percent risk of conflict within 3 months”), which provide analysts with a solid basis for planning countermeasures.

With this aim, some studies applied deep learning, machine learning and techniques to make an AI-based model of terrorism. Moreover, others have integrated Natural Language Processing to extract helpful information, with machine learning showing effectiveness in categorization of different types of assaults (Abdalsalam et al., 2023)

-Intelligent process automation: AI does not just perform repetitive tasks such as transcribing audio or classifying documents. It also includes sophisticated forms of pre-analysis: for example, a system could automatically categorize thousands of intelligence reports into thematic clusters (e.g., “suspicious economic activity,” “military movements,” “online propaganda”), highlighting those most relevant for in-depth human analysis. This appears at first glance to free analysts from monotonous tasks, allowing them to focus on

aspects that require insight, creativity and critical judgment, such as strategic assessment of the implications of an event. However, we are in the early days of this automation of analysis, and we wonder if there may be any medium- and long-term implications arising from this interactive process between AI and analyst. As already extensively studied in law enforcement, stress responses affect motor and cognitive skills needed for urgent situations. Employees who lack the ability to cope may become a threat, for colleagues, the public and themselves (Rabbing et al.2022).

Similarly, intelligence analysts are part of the security system and it is needed to work under stress and pressure.

The technological transformation brings significant complications. We live in the “Dopaminergic Era” (Lembke, 2021), a term coined to describe a world in which fast and continuous stimuli, such as social media notifications or real-time data streams, activate dopamine release in the brain, creating a form of addiction similar to the one induced by substances such as cocaine. For intelligence analysts, constantly exposed to dashboards that update information every few seconds, this can be translated into a reduction of concentration in completing a task, as well as increasing cognitive stress. In addition, studies such as that of Glickman and Sharot (2023), show that prolonged interaction with AI systems amplifies human cognitive biases;

confirm bias or the tendency to overestimate the likelihood of rare events, generating a snowball effect that distorts perceptual, emotional and social judgments.

Research on the effects of high-level interactions between AI and intelligence analysts is limited, but analyst draws on the same neuro-cognitive, emotional and epigenetic mechanisms that apply to everyone.

The data on the actual analysis failures, resulting from these potential alterations we list, are classified, but we can draw clear hypotheses from other related fields.

Emerging Challenges

The challenges introduced by AI are not only technical, but deeply cognitive and psychological, with direct impacts on the quality of intelligence analysis:

-Cognitive Manipulations: Advanced AI systems can identify individual decision-making biases of analysts—for example, a tendency to favor information that confirms pre-existing hypotheses and exploit them to influence their conclusions. It could lead to such conditioning that we could speak of “cognitive blindness”; which is what happens when observing a scene or an image, we focus on some details, completely neglecting others, even rather conspicuous ones. A practical example would be a system that presents data in order designed to emphasize minor threats, causing the underestimation of more

significant risks from analysts. At a deeper level, AI can gradually alter interpretive patterns, changing the perception of risk in subtle but systematic ways, a phenomenon that becomes particularly dangerous when it serves the interests of adversary actors (e.g., targeted disinformation).

Information overload: The modern operating environment does not just provide more data, but presents it in multidimensional complexity that defies human cognitive limits. Analysts must handle increasing volumes of contradictory, ambiguous and often intentionally misleading information (disinformation).

As explained above, real and exhaustive data on failed analyses are confidential. However, we can make assumptions based on existing data in related fields.

A relevant example are drones and remotely piloted aircraft. The rapid expansion of these technologies also brings new challenges, privacy and security risks, moral and ethical issues.

Approximately 84% of reported incidents of drone smuggling occurred on the border between Pakistan and India, 12% between Syria and Jordan, and 4% between Lebanon and Israel.

28% percent of incidents in correctional facilities involve the delivery of drugs and illegal items by drones. Several communities and neighborhoods in the United States, India, the United Kingdom, and Israel have experienced

violence through the use of armed drones (Seidaliyeva et al.2023)

Remotely piloted aircraft (RPA) have been used in military operations for decades. Operators of this kind have a unique set of combat experiences and psychological consequences. RPA crews operate from a distance of up to thousands of kilometers from the target. They are involved in the detection, surveillance, targeting, attack, and post-battle assessment of individuals of interest to a host country or agency from a distance of up to several thousand kilometers. On a psychological level, symptoms like anxiety, difficulty falling or staying asleep, difficulty concentrating, irritability, depression, burnout, sleep disorder and post-traumatic stress disorder (PTSD) are evident, as well as moral damage. To monitor the onset of these pathologies, the US Air Force has included clinical psychologists with the necessary security clearance in RPA operational units.

The results of fifteen years of research suggest that the vulnerability of RPA crews appears to be related to age, low social and/or family support, long working hours, operational aspects such as ergonomics, work shifts, tedious long surveillance missions, and the lack of a formal or informal space for post-attack psychological processing (Norrholm et al.2023).

Technology Dependence: The increasingly deep integration of AI into analytic workflows

is leading to a gradual erosion of autonomous analytic capabilities. Analysts, accustomed to receiving preprocessed data and algorithmic recommendations, may be losing the ability to conduct independent analyses, a phenomenon comparable to muscle atrophy due to lack of exercise (Lieber & Ward, 2011).

This results in overconfidence in AI outputs, a reduced ability to detect algorithmic errors (e.g., an unrecognized false positive), and a loss of fundamental skills such as manual interpretation of raw data. The analyst is thus led into a process of involutional adaptation to his or her task. Many studies remind us of how adaptive human beings are in their integrity; for example, the natural design of the musculoskeletal system and respiratory muscles have already been shown to adapt and change to meet the body's functional needs. They alter their structural and functional properties according to the conditions imposed from environment, thus resulting in a constant state of remodeling. (Lieber et al 2011, Gransee et al.2012).

Psychometric Profiling and Human Plasticity

Psychometric profiling represents an advanced application of AI that builds predictive models of analysts' cognitive and psychological characteristics, relying on frameworks such as the Big Five (openness to experience,

conscientiousness, extraversion, agreeableness, emotional stability). For example, a system could monitor how likely an analyst is to explore alternative interpretations (openness) or maintain decision-making lucidity under emotional stress triggers (emotional stability), reaction times to information and data, or choices made in simulated scenarios. However, the plasticity of the human brain complicates these models.

Studies such as that of Merrill et al. 2019, show that environmental stimuli-from noise in a crowded office to the pressure of a deadline, activate epigenetic mechanisms that alter gene expression; affecting memory, stress response, and decision-making ability. This process is analogous to muscular plasticity (Gransee et al., 2012), where muscles adapt to mechanical load: the analyst exposed to constant stimuli might develop greater stress tolerance, but also a risk of burnout if the load exceeds physiological limits. Dependence on rapid dopaminergic stimuli (Lembke, 2021) and interaction with the social environment (Cole, 2014) introduce additional layers of complexity, requiring strategies that preserve cognitive flexibility without sacrificing it to automation. We also add that exposure to continuous stressogenic stimuli from which you cannot escape has already led to recognition of symptoms of Complex Post Traumatic Stress Disorder (PTSDC).

From memory formation to immune function, the experience-dependent plasticity correlate with epigenetic modifications and this applies to both micro- and macrosocial environments, (Merril et al 2019). Genes and social environment influence and change each other, shape an individual's sensitivity to the social environment (Reis et al., 2013).

Materials and Methods

This study employs a theoretical-conceptual approach, utilizing the General Morphological Analysis (GMA), developed by Fritz Zwicky and refined by Tom Ritchey, to address the complex, multidimensional, and non-linear interactions between AI and human analysts. The methodology is intentionally non-empirical, focusing on systematic mapping of possibilities rather than data-driven validation, with future empirical validation proposed through analyst interviews or experimental data on AI trust levels. The GMA process involves four detailed phases, each executed with transparency regarding decisions and eliminations as shown in figure 1.

Figure 1

Identification of Key Variables

Process: Five variables were selected after an iterative mapping of stakeholders (e.g., frontline analysts, AI developers, policymakers), operational domains (e.g., human-AI

interfaces, data flows), and interdependencies (e.g., causal links between stimulus speed and resilience). Criteria included strategic relevance (e.g., resilience impacts decision accuracy) and measurability (e.g., stimulus speed in inputs/minute, resilience through Perceived Stress Scale).

Variables:

- AI Autonomy: Degree of independent operation
- Cognitive Integration: Level of human-AI decision fusion
- Human Resilience: Capacity to adapt under stress
- Stimulus Speed: Rate of information presentation
- Social Support: Structure of analyst interactions
- Justification: These variables capture the technological, cognitive, organizational, and neurobiological dimensions critical to resilience.

Definition of Configurations

Process: Each variable was assigned three states based on current conditions, theoretical limits, and operational thresholds. For example, AI Autonomy states are: Low (passive tool, e.g., data filtering on command), Medium (suggestive, e.g., pattern highlighting with human control), High (autonomous, e.g., full report generation with minimal supervision).

States:

- AI Autonomy: Low, Medium, High
- Cognitive Integration: Separation, Collaboration, Symbiosis
- Human Resilience: Fragile (>20% errors), Moderate (10-15% errors), Robust (<5% errors)
- Stimulus Speed: Slow (fewer than 10 inputs/min), Moderate (10-50 inputs/min), Rapid (more than 50 inputs/min)
- Social Support: Isolation, Casual Network, Cluster Network
Total Combinations: $3^5 = 243$ theoretical configurations.

Construction of the Morphological Field:

Process

A multidimensional matrix was created, listing all 243 combinations (e.g., Configuration 1: "Low Autonomy + Separation + Fragile Resilience + Slow Speed + Isolation"; Configuration 243: "High Autonomy + Symbiosis + Robust Resilience + Rapid Speed + Cluster Network").

Interactions were analyzed: direct (e.g., Rapid Speed reduces Resilience), second-order (e.g., High Autonomy with Isolation erodes supervision), and feedback loops (e.g., Collaboration boosts Resilience, enhancing AI use).

Bifurcation Points: Identified transitions like Moderate to Rapid Speed pushing Moderate Resilience to Fragile, or Casual to Cluster Network improving resilience.

Reduction of the Field:

Process: The 243 configurations were filtered through three progressive stages with explicit elimination criteria:

Logical Incoherence: 93 combinations were excluded (e.g., "High Autonomy + Separation" is illogical as autonomy requires integration; reduced to 150 configurations). The reason was that high autonomy implies active AI decision-making, incompatible with fully separate human processes.

Technical Impossibility: 100 configurations were removed because current technology limits full cognitive fusion between AI and Human Brain e.g., "Symbiosis" at maximum level requires unavailable brain-computer interfaces in 2025; reduced to 50 configurations).

Ethical Constraints: 35 configurations were eliminated for e.g., "High Autonomy + Isolation + Rapid Speed" risks total AI dependence; reduced to 15 configurations.

We have eliminated these alternatives for ethical reasons, as they violate privacy and human oversight. Both must be preserved.

Compatibility Matrix: Each state was cross-checked (e.g., "High Autonomy" is incompatible with "Fragile Resilience" due to error risks). Example eliminations: "High Autonomy + Fragile Resilience + Rapid Speed + Isolation". This combination may lead to catastrophic errors.

Other combinations have been eliminated due to technical mismatch, such as "Low Autonomy + Symbiosis".

Result are shown in Table 1: 15 plausible configurations were retained for scenario development, ensuring logical, feasible, and ethical outcomes.

Table 1

In our considerations we take also in account the Network Configuration. Previous studies have shown the Cluster network seems to function better. It is cohesive and organized groups with strong connections e.g., teams of 5-7 analysts who meet daily seems to be more effective (Centola, 2010 p.1194).

Limitations: The study lacks empirical data, a deliberate choice to prioritize theoretical exploration, with future validation suggested through analyst inter views or experimental data on AI trust levels.

Results

The GMA yields three primary scenarios from the 15 plausible configurations, each reflecting distinct AI-human interaction dynamics: Scenario 1: Dominance of artificial intelligence

Configuration: High autonomy, symbiosis, fragile resilience, rapid speed (more than 50 inputs/min), isolation.

Description: AI manages nearly all analysis (e.g., generating reports in 10 minutes), with

analysts passively supervising through biometric-monitored interfaces. Fragile resilience leads to systematic errors (e.g., mistaking civilian logistics for military operations) due to continuous dopamine-driven stress (Lembke, 2021).

Cognitive integration is symbiotic: AI monitors biometric parameters of analysts (e.g., heart rate, cortisol levels, ROS - Reactive Oxygen Species, sweating) via wearables, adjusting the flow of information to maximize perceived efficiency.

The use of technology to analyze emotions raises ethical questions regarding privacy, the accuracy of emotion recognition, and the potential for bias. It is essential to ensure that such technologies are used ethically and responsibly.

Emotional recognition through facial expressions has begun in a more assiduous manner in the US after September 11, 2001 and SPOT is a system used in national level.

It uses 94 criteria, all signs of fear, stress or deception with the aim to “automatically” detect terrorists. This system has been heavily criticized because who is uncomfortable under questioning stressed or have past negative experiences with boarder guards or police can score higher. Civil-liberties groups highlights for its racial bias and lack of scientific methodology. To date there is no evidence that it has produced clear successes. As it is used in the field of national security,

the technical details of the program are secret.

Data from devices used in the medical and civil fields are available. “Dreamer” is a multi-modal database consisting of electrocardiographic (ECG) and electroencephalographic (EEG) signals recorded during the elicitation of emotions through audiovisual stimuli. For its construction, 23 participants were evaluated, who also reported their self-assessment of their emotional state after each stimulus, in terms of arousal, dominance, and valence. The signals were acquired using portable, wearable, wireless, commercially available, low-cost equipment. The results of the database were comparable to those obtained for other databases using non-portable, expensive, medical-grade devices (Katsigiannis and Ramzan 2018).

Reactive Oxygen Species are correlated with all kind of stressogenic stimuli and ROS medical devices for bone damage cases in patients diagnosed with diabetes are already in use (Zimei et al.2022).

An Italian research group, “The Vert Project” is evaluating ROS levels related to stress, including psychological stress, with the aim to develop a suitable medical device. The research is ongoing, so we do not have preliminary data to share at this time.

Discussion

Scenario 1: Dominance of artificial intelligence

This scenario offers extreme efficiency but risks cognitive atrophy and burnout, as described about the biological plasticity of the human brain and other organs.

A real-world example: An undetected algorithmic bias in facial recognition during a crisis.

Evaluation: Feasible but unsustainable due to human fragility. This scenario was selected by configurations like "High Autonomy + Symbiosis + Fragile Resilience + Rapid Speed + Isolation," aligning with extreme AI reliance.

Human resilience is fragile, with analysts experiencing anxiety and/or burnout compatible symptomatology under stressful trigger conditions. Continuous making systematic errors such as false positives (e.g., mistaking a logistical civilian movement for a military operation).

Lack of active analytical exercise reduces the number of neural connections, a phenomenon similar to muscle atrophy (Lieber & Ward, 2011), with loss of critical skills such as autonomous interpretation. Moreover algorithmic errors (e.g., a bias in facial recognition) go unnoticed due to lack of skilled supervision. As already known rapid speed activates a continuous release of dopamine (Lembke, 2021),

leading to addiction, chronic anxiety and, in the long term, burnout and depression.

As shown by Glickman & Sharot, 2023 symbiotic interaction amplifies human biases, such as the tendency to overestimate minor threats.

This scenario is technically feasible with current technologies (e.g., advanced deep learning), but unsustainable in the long run. Human frailty and social isolation make it vulnerable to systemic collapse, especially in cognitive warfare contexts where adversaries could exploit such weaknesses.

Scenario 2: Balanced collaboration between analyst and artificial intelligence

Configuration: Medium autonomy, collaboration, robust resilience, moderate speed, clustered network.

Description: In this scenario, the AI functions as a collaborative partner with moderate autonomy: it pre-processes the data (e.g., filters 10,000 reports to extract 100 relevant ones), identifies preliminary patterns (e.g., correlations between seemingly disconnected events) and makes suggestions to the analysts, but leaves them full control of the final synthesis and strategic decisions. The pace of information flow is moderate, between 10 and 50 entries per minute - for example, an alert every 30 seconds on a dashboard that the analyst can mute or deepen at will. Analysts work in clustered networks: teams of 5 to

7 people who meet daily, share interpretations, cross-check results and support each other emotionally. Resilience is robust: even under pressure (e.g., a sudden diplomatic crisis), analysts keep errors to a minimum (<5%), thanks to specific training (e.g., mindfulness techniques, neurocognitive and emotional training and analysis ecc.) and a social environment that reinforces lucidity (Centola, 2010 p.1194).

Integration is collaborative: the AI responds in real time to analysts' requests (e.g., "show more data on this source"), creating a dynamic dialogue between man and AI machine.

Discussion :

Advantages:

Human-AI synergy: AI amplifies efficiency, e.g., reduces preprocessing time from 4 hours to 30 minutes, while human intuition refines interpretations for e.g., recognizes a geopolitical bluff that AI does not pick up on.

Strengthened resilience: cluster networks propagate positive behaviors such as calm under pressure (Centola, 2010), reducing stress and increasing quality analytics. The TIDE tool developed specifically from Labib et al 2021, for a UK Military SIGINT context to enable real-time analysis intelligence information, shows the support of a group decision improve the intelligence analysis process throw three pathways:

a) Reducing the cognitive effort for senior managers, who having access to the

group decision will combine the individual decisions.

- b) As many research have shown groups often make more accurate judgments than individuals.
- c) The team decision can be used as a group feedback, which improve the efficiency and effectiveness
- d) Last but not least, the timely sharing of aggregated scores with second line intelligence analysts will speed up the scoring processing and a consensus will be find more quickly (Labib et al 2021).

In this tool, analysts actively practice their skills, avoiding the development of total dependence on AI. Moreover as already shown and described in a biological level, moderate pace allows adaptations to different situations (e.g., speed up in crisis, slow down in routine).

Disadvantages:

Organizational costs: it requires ongoing training for e.g., quarterly courses on bias neurocognitive and emotional, and coordination among teams.

Reduced response: Compared to scenario 1, response times are slower, for example 1 hour versus 10 minutes for a report, which can be critical in extreme emergency situations.

Evaluation:

This scenario is sustainable and balanced, combining AI strengths with human robustness. The social environmental network mitigates the risks of burnout and amplification bias, making it ideal for complex and prolonged contexts.

Scenario 3: Human-Centric Separation

Configuration: Low autonomy, Separation, Moderate resilience, Slow speed, Random network.

Description: Here AI has a minimal role, limited to passive support tasks such as searching for data on demand or transcribing audio, with no autonomous predictive or decision-making capabilities. Analysts perform the entire analytical process manually: they collect data, organize it, interpret it, and write reports without proactive suggestions from AI. The pace is slow, with fewer than 10 inputs per minute for example, a report every 5-10 minutes, similar to a pre-digital environment. Resilience is moderate: analysts handle routine situations reasonably well (10-15% error rate), but fail to develop in time the cognitive adaptation needed to rapid critical stimuli under intense pressure (e.g., a multi-frontal crisis). Social interactions are casual: analysts occasionally chat via e-mail or consult informally, with no defined team structure.

Discussion:

Advantages:

Preserved human autonomy: analysts retain full control, reducing technological dependence and other emotional and cognitive consequences of inadequate interaction with AI, as described above.

Lower stress: slow speed avoids overload, allowing in-depth reflections for e.g., a detailed analysis of a single event in 8 hours.

Transparency: the absence of automation eliminates the risks of hidden algorithmic bias.

Disadvantages:

Inefficiency: in modern contexts with high data volumes (e.g., millions of tweets at day), the manual approach is impractical.

Obsolescence: does not take advantage of AI's predictive capabilities, making analysis slow and less competitive (e.g., days' delay in detecting a threat).

Limited Resilience: lack of structured support, AI or social, exposes analysts to collapses in resilience in extreme situations that undermine their effectiveness analytics and short to medium term.

In the 21st century, effective security strategies cannot rely solely on military power. An article by Hersch & McLain /2024) explores the transformation that information technologies and social media are bringing to conflicts. There is an urgent need to expand defenses beyond traditional military spheres. The authors explore how, especially in the

East, cognitive vulnerabilities and social media are being used to promote strategic objectives.

Evaluation: This scenario is suitable for niche contexts or organizations with limited resources, but inadequate for modern intelligence, where speed and complexity dominate.

Best Scenario and Backcasting: “Balanced Collaboration”

Rational Scenario 2 (“Balanced Collaboration”) was selected as optimal for several reasons. It offers a balance between the technological efficiency of AI and human resilience, avoiding the extremes of cognitive atrophy (scenario 1) and operational inefficiency (scenario 3). The clustered network of analysts and moderate pace maximize synergy and sustainability, making it ideal for 2030, an era in which further increases in information complexity and cognitive threats are expected.

Some suggestions we can draw from our model analysis and the literature include:

- a) Development and testing of AI filters to regulate stimulus frequency, e.g., software that limits inputs to 50 per minute, with the possibility of manual override.
- b) Updating AI interfaces to include warning signals in case of cognitive overload (e.g., visual alerts if the analyst exceeds a scientifically decided limit of continuous exposure).
- c) Integration of wearable devices to monitor stress.

Results: 80% of analysts report increased clarity and control; systematic errors (e.g., false positives) reduced by 15% compared to baseline 2025.

Backcasting Roadmap for Scenario 2 (2025-2030)

2025: Pilot programs in 3 intelligence agencies testing medium-autonomy AI tools with robust training protocols.

Security services, like many other professions, utilize psychometric scales to assess stress levels in their personnel. Intelligence analysts are just a part of this scenario.

These scales are needed to identify individuals who may be experiencing high levels of stress which can impact job performance, mental health, and overall well-being to target interventions and support for personnel and ensuring effective performance.

Some of the scales most commonly used or refined in recent years in line with social and geopolitical changes are:

- Perceived Stress Scale (PSS), measures the degree to which situations in one's life are appraised as stressful.
- The Job Stress Scale (JSS) provides valuable information about the specific challenges individuals face in their work roles.
- War Related Stress Scale consists of 21 items, divided into three factors: person-related stressors, society-related stressors,

security-related stressors (Vergova et al 2024)

- Cyber Operations Stress Survey (COSS): Studies fatigue, frustration, and cognitive workload in cybersecurity operations; developed from Dykstra and Paul of the US. Departement of Defence.

Other specific scales are Anger and Support Scale, Anger Management Risk, Aggression Temperament and Personality Survey, Conflict Behavior Questionnaire, Conflict and Problem Solving Scales.

The ability of employees to comply with the organization's information security policy (ISP) has a significant impact in every workplace.

In a study conducted by Chen et al. (2022), the Emotion Scale, the Information Security Challenge Stress Scale, and the Information Systems Security Policy Compliance Scale were combined. It was found that information security challenge stress is positively correlated with positive emotions and negatively correlated with negative emotions, and that positive emotions are also correlated with ISP compliance. These emotions play a mediating role in the relationship between information security challenge stress and ISP compliance. The results of this study are consistent with those of previous studies.

Initial tests could be carried out to all analysts, combining psychometric tests with

measurable biological parameters (as described above) to obtain a combined assessment.

Interviews could be conducted focusing on the clinical symptoms of frequent psychologic and psychiatric disorders in Analysts or disorders emerging from Internet and correlated overuse such as well-known Internet Addiction (Marin et al 2020) or Internet Gaming Disorder and Neurological and clinical features correlated, cognitive and emotional vulnerabilities (Weinstein and Lejoyeux 2020), analysis of current workflows.

As described above Analyst should be tested regularly within 6 months. Information overflow and diversity is a main challenge to military intelligence. The effects of this overflow was recognized earlier in the 2000', the quick evolution of Cyberspace and AI have overlapped expectations and the challenge of information revolution became imperative (Labib et al 2021).

The creation of a planning committee to oversee the roadmap is needed, in line with the results of Labib et. Al 2022 and Centola 2010, concerning the importance of the team structure.

2026: Implementation of cluster network structures and standardized resilience assessment tools (Perceived Stress Scale and others, cognitive flexibility metrics).

Launching intensive training programs on bias awareness (e.g., 2-day workshop on confirmation bias and anchoring).

Introduction of mental resilience techniques already used in the field of mental health, but which take into account the specific nature of the work. We have already provided a comprehensive overview in the previous paragraphs.

Regular crisis simulations to test resilience may be needed, e.g., 48-hour scenarios with conflicting data.

2027: Quarterly rotation systems and neuro-cognitive and emotional programs fully integrated into standard operations. Regular integration of wearables to monitor stress.

2028: Advanced human-AI collaboration interfaces deployed with real-time stress monitoring. Creation of cluster networks across all units for e.g., teams of 5-7 analysts with quarterly rotation to avoid stagnation. Introduction of daily debriefing sessions (e.g., 30-minute discussion of ongoing analysis).

Training of “cognitive facilitators” trained in various cognitive analytic and psychoanalytic short, medium, and long-term analytic strategies to support teams (e.g., operational psychoanalysts assigned to each group).

Results: 25% increase in prevalence of resilient behaviors for e.g., calmness under pressure observed in simulations; 20% reduction in burnout cases compared to 2025.

2029: Full integration of balanced collaboration model with continuous competency assessment.

2030: Mature human-AI analytical ecosystem with optimized resilience and analytical quality.

Description of the desired state:

AI preprocesses 70% of operational data (e.g., filters 1 million records in 20 minutes), while analysts decide 100% of strategies, integrating insight and context. Resilience is robust: less than 5% error rate even in prolonged crises (e.g., a 6-month conflict). Each unit of intelligence operates in fully functional cluster networks, with teams meeting physically or virtually every day.

Previous Actions:

Full implementation of collaborative AI systems; universal resilience training; social networks structured.

Results: Analytic quality at 95% accuracy; top analysts' psychological well-being (e.g., <2% burnout annually).

Critical Points: Cultural resistance, e.g analyst who prefer to works alone, or budget cuts, mitigated through 2026 pilots and transparent communication with stakeholders.

Limitations and Future perspectives

Analysts judgments due to a number of factors, are often inconsistent, including the sheer mass of data, variation in nature and types of the intelligence information and the

time pressures the analyst is operating under (Labib et al 2021)

The GMA analysis underscores that analyst resilience in the AI era is a dynamic process shaped through technology, human adaptability, and organizational culture. Scenario 2, Balanced Collaboration, emerges as the optimal model, balancing AI's predictive power with human judgment, mitigating risks like cognitive manipulation or burnout. Resilience is an adaptive competency, enhanced through structured social networks and dosed stimuli-recovery cycles. Ethically, AI autonomy must preserve transparency and privacy, especially given psychometric profiling risks. As already fully mentioned the ours is just the working paper to road the map for future longitudinal Studies that have to track human-AI interaction effects over 2-5 year periods, measuring resilience degradation or enhancement patterns. Possible tools may be the development of comprehensive monitoring framework which may include Cognitive Flexibility, measured through scales described above; Wisconsin Card Sorting Test adaptations, Stress Tolerance Perceived Stress Scales etc , and biometric parameters already in use such as heart rate, cortisol biomarkers or Reactive Oxygen Species which are currently being tested.

The decision quality may be tracked through accuracy metrics under varying AI autonomy levels. The experimental simulations have to

take in account neurocognitive and emotional load under varying AI autonomy levels, measuring decision accuracy, response time, and stress indicators.

This roadmap, integrating technology, training, and culture, transforms complexity into opportunity, ensuring security and analyst well-being through 2030. The balanced collaboration model provides a sustainable framework for preserving human agency while maximizing AI capabilities, creating resilient analytical ecosystems capable of addressing evolving security challenges.

To our knowledge, this is the first study to combine MGA with neurobiological aspects in assessing the interaction between AI and intelligence analysts, and it is the first to evaluate the theoretical interventions to be implemented by 2030 to make the most of the AI-human interaction.

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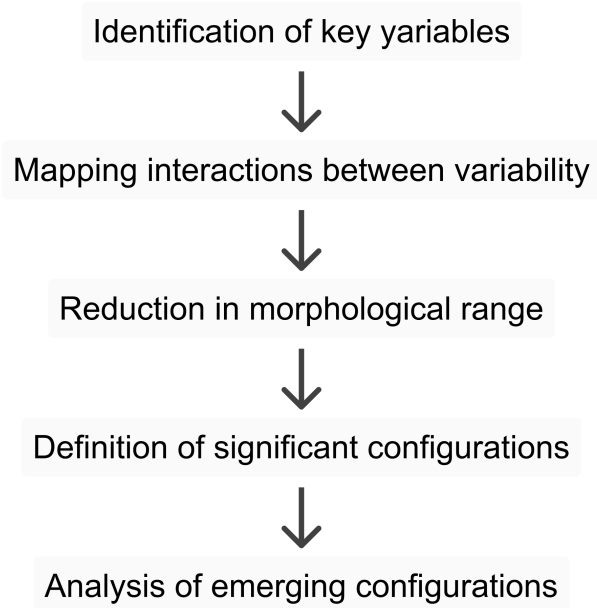
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Table 1. Variables and States

Variable	State 1	State 2	State 3
AI Autonomy	Low (passive tool)	Medium (suggestive)	High (autonomous)
Cognitive Integration	Separation	Collaboration	Symbiosis
Human Resilience	Fragile	Moderate	Robust
Stimulus Speed	Slow (fewer than 10/min)	Moderate (10-50/min)	Rapid (more than 50/min)
Social Support	Isolation	Casual Network	Cluster Network

Figure 1. Steps of General Morphologic Analysis (GMA)



Nketa's foetal evacuation in Esiaba Irobi's. The Colour of Rusting Gold: Therapeutic or aborti- cide?

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Abstract

This paper evaluates foetal evacuation in Esiaba Irobi's *The Colour of Rusting Gold*. Medical doctors and herbalists frequently encounter complications from induced abortions. In Nigeria, some women survive with interventions from doctors and herbalists, but many lose their lives. Some doctors, particularly herbalists, have violated professional ethics to save women with post abortion complications. These practitioners have experienced emotional and psychological distress for violating professional ethics. This paper employs textual analysis and subjective interpretation to study the text. This paper argues that women will always find reasons to pursue induced abortions. When it results in a situation between the life and death of the mother, especially when the foetus is no longer active, medical doctors should not be condemned for saving the mother's life through therapeutic foetal evacuation. This suggests that when medical reports confirm the foetus is no longer viable, doctors should be permitted to perform therapeutic evacuation to stop bleeding and save the mother's life. To prevent aborticide, there is an urgent need to raise awareness among herbalists about their limitations in healthcare practice. There should be widespread public education on the importance of seeking medical care in orthodox hospitals. Television and radio stations could facilitate this through agenda-setting strategies.

Keywords: Abortion, abortion laws, creative works, Esiaba Irobi, ethical guide

Introduction

Creative artists have put great effort into the representation of abortion. Joan Micklin Silver's *Private Matter* (1992), Cary Solomon, and Chuck Konzelman's *Unplanned* (2019), and *If the Walls Could Talk* (1996), are some western creative works on the subject. Omobowale's *The President's Physician* (2004) and Esiaba Irobi's *The Colour of Rusting Gold* (2014) are Nigerian literature that also extensively dealt with the subject of abortion. The considerable efforts of creative artists over the years have aided medical and therapeutic processes, and as well, provide a substantial role in medical education (Jones, 1990; Oyebode, 2009; Stephen, 2021; Blessing, 2025). Stephen Kekeghe further affirms that as medical practice evolved, literature has also emerged as a powerful tool for humanizing it (Stephen, 2021). Literary and medical scholars have recognized the importance of literary knowledge in clinical or medical settings. Whether intentionally or inadvertently, films and literature have raised awareness of human health by making medical issues and treatments the main subject. In the general fields of health and illnesses studies in Nigeria, Blessing Adjeketa and Stephen Kekeghe have extensively researched the causes of mental illnesses and treatment preferences in Nigeria, using Nollywood films

and Nigerian literature as case studies, respectively (Stephen, 2020; Blessing, 2021). Blessing has also used documentary films to evaluate the state and effect of diabetes and cancer among people in Nigeria (Blessing, 2025). However, studies of abortion, as it affects medical practitioners in the arts, particularly Nigerian literature, are limited. While scholarship about abortion and ethical consideration in film is widely represented, it is poor in dramatic texts. The reason is that there are more films on the subject for scholars to x-ray than dramatic texts. Nigerian dramatic texts, particularly plays, focus more on politics, economics, and religion than on health and illness and ethics.

As mentioned before, films and literary texts are available on the subject of induced abortion. However, films and drama texts in recent years are tailored towards an attempt to discredit induced abortion by representing post-abortion complications more often, leaving ethical consideration undiscussed. Characters were also made to face restrictions like no access to clinics and doctors to carry out the procedure, and the representation of lack of parental consent and the stigma associated with abortion (Abortion Onscreen, 2020). This, however, some writers have termed "consistent patterns of misrepresentation" (Raluca Andreescu, 2022). According to Herold and Sisson, (2020), films portray characters involved in abortion to be younger

and better in social and economic standing than the real-life abortion patients. Also, on-screen fictional depictions and television portrayals tend to exaggerate the medical risks associated with abortion. The fact is that there were more characters in their teen engaging in abortion in cinema than in real-life situations (Abortion Onscreen, 2020). No careful evaluation has been done on the motive of the medical personnel involved in the act of these creative works. The case is even worse in Nigeria scholarship where a handful of studies if any are available that focus on the doctor's motives and intentions in engaging in foetal evacuation.

One issue that is a cankerworm gradually eating deep into the fabric of the Nigerian nation is that of abortion (Results from 2018-2020 PMA abortion surveys in Nigeria). The rate at which young people engage in criminally induced abortion assisted by some 'health practitioners' (patent medicine store dealers) in Nigeria is alarming. Young people aged 15–31 often report having undergone at least one abortion (Blessing, 2025). Many young women have lost their lives due to post-abortion complications. To save some, few doctors and traditional herbalists have disregarded the ethics of the profession, hence, many doctors have been accused of a felony. The death of many arises from complications of using herbs and over-the-counter medica-

tion(s) for induced abortion. Some who survived, do, by the intervention of medical doctors in orthodox hospitals. Post-abortion complications particularly bleeding are responsible for the death of many young girls. Medical practitioners, particularly those in the private sector, receive post-abortion complicated cases frequently, requiring foetal evacuation to save the mother's life. Many argue that medical practitioners who engage in foetal evacuation in complicated instances of induced abortion to save mothers' lives commit aborticide. However, few argue that the act is therapeutic because the attempt is to save the mother's life. Each case is subjective in analysis. Circumstances surrounding a case, like, the status of the foetus, at the time of complication, the condition of the mother, the patient and patient's relative's consent, and the qualifications of the health care provider must be looked into. While this issue has been widely represented in the cinema (Raluca Andreescu, 2022), drama texts have also x-rayed the subject. Moreover, most scholarship and discussions on abortion focus on women as key actors, with less attention given to healthcare practitioners, particularly doctors.

This study uses content and subjective analysis, to read foetal evacuation in Esiaba Irobi's *The Colour of Rusting Gold*. The study depends on the ethical guide for health care practitioners particularly doctors. The main

thrust of this study centred on the issues surrounding the evacuation of Nketa's foetus. To arrive at a well-informed conclusion and recommendation, the following question is relevant. Did Otagburuagu abort Nketa's foetus or he evacuated the foetus?

Ethical Guide for Doctors and Herbalists

The commitment nature of health practice demands that practitioners need an ethical guide in practicing the profession. These guides are in the oath usually taken by new medical doctors during induction into the profession. Oath taking by health care workers, especially medical personnel has been in existence for long. Hippocrates, the Greek physician and father of medicine, proposed the Hippocratic Oath, which is the first written statement of medical ethics in the Western world. During their entrance into the medical field, new doctors make this pledge, which outlines a patient-centred approach to practice (Stephen, 2021). Schiedermaye (1986) added that to uphold the ethical norms of the medical profession, it is customary for new medical personnel's to take an oath from the claimed healing gods like Apollo, Aesculapiu, and all healing gods and goddesses. The Hippocratic Oath has largely formed part of modern-day medical ethics which refers to a set of moral guidelines that enhance the practice of

clinical medicine (Beauchamp, 2013; Berdine, 2015; Weise, 2016)

Herbalists, particularly, in traditional African societies also have and follow an unwritten but strong ethical code of the profession (Ezedike et al., 2019). This code is built within the framework of standard of morality in patient care. Although not written, the professional ethics are like that of the Hippocratic Oath. It can be asserted that the Oath though a written guide for medical doctors, falls in line with the unwritten code of ethics guiding traditional healers. Notably, some essential ethics that are highly helpful in the patients' care highlighted in the Hippocratic Oath (Stephen, 2021) are in the unwritten code for herbalists. Hence, Doctors (herbal practitioner included) who treat patients are bound to uphold these ethics. The doctor's duties to the patient are determined by the wordings in the oath, part of which states that he will only recommend treatments that are useful based on his skills and judgment, abstain from inflicting injury or hurt, and lead an excellent personal and professional life (Dam Augusty, 2025). Also, they are to serve to benefit the patient, not getting involved in voluntary harmful practices or corruption, not wilfully taking someone's life even when asked to do so, not getting involved in abortion, keeping patients' health matters secrets, abstaining from abusing the bodies of man and woman,

and practicing the trade in good faith, pure and holy.

African traditional morality, which underpins healthcare ethics, holds that an herbalist who contributes to a patient's death may face misfortune, including illnesses such as mental disorders or even death. When he lies or steals or supports lies or stealing, the gods weaken his powers and knowledge of the use of herbs leading to disrespect from the people he serves. Whether called by the gods to serve humanity or trained as herbalists, the traditional moral principles are there as a guide (see Emilio 2016). Whether orthodox or traditional, working closely by the professional ethics yield "respect by all men, in all times". However, when there are a trespass and violation of the ethics, the doctor is deemed to lose the respect of the people and possibly surfer.

Abortion as a National Issue in Nigeria

Approximately 3–5% of women of reproductive age undergo abortions annually, equating to 1.2–2.0 million abortions in Nigeria (PMA, 2020). Recent years in Nigeria have seen a high number of young women die because of widespread, careless abortion. This is because lower-level public and private healthcare facilities typically do not handle abortion cases, most of which are complicated. Therefore, only public tertiary facilities

provided post abortion care and safe abortion services to save a woman's life in Nigeria. The report also stated that there were approximately 33 abortions per 1,000 women aged 15 to 49 in Nigeria in 2012. It concluded that most of these abortions would be considered unsafe and many lost their lives. A 2012 study indicates that women in rural areas, younger women, those with no education, and economically disadvantaged women are most likely to undergo unsafe abortions, often seeking care at health facilities only after complications arise (Ibid).

For this study, a survey of 41 women (12 from South-South Nigeria, 10 from Western Nigeria, 13 from Eastern Nigeria, and 6 from North Nigeria) living within Delta was conducted among health care assistant workers, working in secondary care services (private hospitals). The survey reveals that medications used for induced abortions, which often cause post-abortion complications and death, are purchased from patent medicine stores over the counter and backstreet abortion clinics, as registered private healthcare facilities do not perform criminally induced abortions. It was also found that, in the worst cases, herbalists administer liquid herbal medicines made from plants and roots for either induced abortion or foetal evacuation (Blessing, 2025). The perpetrators according to the survey fail to recognize that the foetus is a human being with all the potentialities of all people and that

killing it is murder, which is only acceptable in the most desperate situations where the mother's life is in direct danger (Cosgrove et al., 2016).

Due to the nature of its duties, the medical field in Nigeria (and health care services in general) is and has remained a highly ethical organization fighting against illegal abortion. Thousands of Medical men have been fully trained with a strong sense of ethical duty regarding abortion in Nigeria. Beginning from the medical school, students are given ethical instructions on the subject. Beyond ethics, the law in Nigeria is not silent on the issue of abortion.

Nigeria's abortion regulations are outlined in sections 228–229 and 230 of the penal code. It is stated that a doctor who causes a woman to miscarry faces a felony charge and would serve a jail term of up to 14 years. The law is not only directed towards medical practitioners. Article 232 mentions 'anyone'. It specifies that anyone who willfully causes a woman with a child to miscarry, without doing so to save the mother's life, also faces a maximum 14-year prison sentence (C R R, Nd). Further, a felony is committed by anyone who gives a lady poison or anything else toxic with the aim to induce miscarriage. Importantly, any woman who, with intent to procure her miscarriage, unlawfully administers to herself any poison would serve a seven-year jail term.

The law is direct on the subject. However, despite the strong ethical training and explicit laws on abortion, illegal abortion is still dominant in Nigerian society. Not only in Nigeria but around the world. The reasons why women engage in abortion have been widely studied (Akinrinola et al., 1998; Fatima, et al., 2015; Neema Mamboleo, 2012).

Considering the above, scholars like Amade Roberts Amana have advocated for legal reform to liberalise access to abortion services. He draws on the fact that restricting access to abortion services, other than in cases of the endangerment of maternal health, has led to an increase in maternal mortality. He argued that a prohibitor regime is counter-productive because women who seek abortion, but cannot legally access it, resort to backstreet abortion clinics, with attendant risks. In his conclusion, he stated that although the Nigerian abortion law was derived several decades ago from England and Queensland in Australia, it has not undergone any review. He advocates that reform is imperative to bring the legal regime in tandem with the realities in the country (Amade, 2022).

Scholars like Amede believe that women would always find reasons to participate in abortion. "When individuals are not able to terminate foetus in their comfort region, they will travel to get it terminated" (Raluca Andreescu, 2022, p.123). When they do not find a professional medical doctor to terminate

the pregnancy, some locate herbal home to help in the termination of the foetus. However, when complications arise, “they seek evacuation at orthodox hospitals. One of the commonly referenced reasons for seeking to abort foetus is “the wish to save the malformed child from a life of misery” (Akademisk, 1975, p.5). Akademisk, further stated that the choice to undergo an abortion is rarely made for a single reason. Induced abortion, may appear to be quite acceptable and desired in rape cases, but if one is a Roman Catholic ‘or a Jehovah's Witness’, does the foetus, despite being the product of violence, have the same human status as the mother, and abortion is forbidden? (Exodus 21: 22-23). This shows that besides the medical ethical principles and the Nigerian law prohibiting abortion, there are also moral and religious dimensions on the subject.

The survey conducted by Blessing in 2015 mentioned earlier also agrees with Akademisk (1975) on the motive why some women in Nigeria engage in criminal abortion, some of the factors include being too young to give birth, not wanting to give birth out of wedlock, giving birth would cause hindrance to academic progression, poor relationship with partner, pregnancy not for the husband (infidelity), having a less than a year old baby (too short a time between pregnancy). Denial of the pregnancy by the man, the partner has no source of income to cater for a baby, etc. Of

interest, these yardsticks are not adequate to break medical ethics, religious morals, and the law of the land.

Why the Herbalist Place a Choice of Treatment Place in Africa?

Since the world's beginning, people have been experiencing one form of illness or the other. Severe diseases such as cancer, diabetes, and hypertension have claimed millions of lives across the continent, particularly in sub-Saharan Africa (Blessing, 2025). Such illnesses as cholera and malaria are not taken seriously and have also taken more lives especially that of children than the termed serious ones like cancer and diabetes (Yuxin Wang, 2022). Causes of children's death resulting from malaria and cholera in Africa are a result of lack of care and attention to the illness after diagnosis (Konji, 2016). Individuals, organizations, and governments have employed several machineries to combat these diseases. Primary, secondary, and tertiary healthcare services have been established to cater to ill health in many communities around Africa. While these hospitals are spread across the towns and villages, the inadequacy of doctors and the high cost of medications and treatment have prevented many from visiting these facilities. They rather prefer traditional healers and herbal homes like the herbalists who are experts in using

herbal remedies for treatment and care. Because their treatment is cheap and, in most instances, allows payment after services. The people prefer to visit a place where small money would be collected only after “when the illness is totally cured” (Irobi, 2014, p.62). This account for the reason women seeks their services for abortion.

The situations above also apply to antenatal services where pregnant women go to the herbal home and traditional physiotherapy centres for treatment. This wide practice has been represented extensively in artworks, particularly films and play texts. Esiaba Irobi's *The Colour of Rusting Gold* (2014), featured an herbalist who is vast among other care services, including antenatal services. However, Irobi's (2014) feature of a woman (Nnenna) visiting an herbalist for antenatal care, is not because orthodox medical facilities were absent or because they were too expensive, but because she trusts the services of the traditional healer (Blessing, 2024). By implication, people in Africa and other parts of the world are not only familiar with the potency of Traditional African Medicine (TAM), which is thought to be the oldest type of traditional medicine in existence, but have a measure of trust in their potency. Also, many people have unwittingly profited from this age-old knowledge by using herbal items that have their roots in African folklore and herbalism.

While the potencies of the herbs are doubtless, leading to high patronage, the practice of usage of the herbs, when to use it and on who to use it for needs keen attention. Many herbalists and herbal homes seem to indulge in criminal care services because they know the herbs and roots to remedy a particular health situation they are not licensed to carry out. Yet, many are not aware of their limitations and, hence, proceed with critical health cases like foetal evacuation that could lead to the death of patients. This present study is focused on one of such cases. The one presented in *Esiaba Irobi's The Colour of Rusting Gold*, where an herbalist carried out a foetal evacuation on a seven-month-old pregnant woman, breaking the code of conduct of his profession.

Materials and Methods

This study utilizes textual analysis and subjective interpretation to explore themes within Esiaba Irobi's "The Colour of Rusting Gold." To complement the textual analysis, the research incorporates insights from a survey of 41 women working in secondary healthcare in Delta State, Nigeria (Private Hospitals). The participants were selected to represent the three major regions of Nigeria: South-South (12 women), West (10 women), and East (13 women), with a smaller representation from the North (6 women). The survey, conducted

orally over five months, aimed to gather perspectives that were then subjectively interpreted in relation to the literary text.

Informed Consent

All human participants in this study gave full consent for participation, and all human names (individuals interviewed) in the article has been anonymised.

Consent to Publish

Recorded Verbal Informed Consent for participation for the study was obtained from participants for their oral interview and opinions to be published. The audio record is with the author and would be made available on reasonable request

Results

Textual Analysis and Discussion

Nketa, “a social kangaroo (Irobi, 2014, p 4)” terminates her seven months old pregnancy. She is rushed into an herbal (private) facility managed by Otagburuagu, an herbalist, by Nanimgaebi, a member of Parliament. Nketa is bleeding heavily, panting and gasping. Some medical doctors (patent medicine store dealers) had complicated her case. Members of the family of Nketa including Nanimgaebi plead with Otagburuagu to remove the fully formed foetal to save the mother’s life. Against his professional ethics, Otagburuagu agrees to save the mother by placing a root between Nketa’s legs to expel

the inactive foetus. Four years later, Nanimgaebi, accused Otagburuagu of aborticide because he refused to kill a political opponent for him to succeed in the coming elections.

Medical doctors and traditional herbal practitioners serve to assist the human creation made by the Supreme Being, the divine, God almighty, in their capacity. For Otagburuagu, his work is that of “helping the creator Chukwu...” (Irobi, 2014, p.50) to cure illnesses and to save lives. Because of the nature of his profession which deals with human health- protecting human life from dying by all possible means, the need to gain patient and patient relative’s trust is imperative. Greatly aided by the moral code of the profession due to the hallowed nature of the job, professionalism is needed to achieve the fit. He needs to be faithful to the ethics of the profession because he has a name to protect.

According to Otagburuagu:

“I have a name that resounds, Otagburuagu! First and foremost, I am a medicine man: a man who lives in the spirit world; a man who bridges the gap between the shrine of the spirits and the mud-walled world of men.... There are many men who have children but would never have names. I have a name. Go into the house of the rich and the poor in this land and mention Otagburuagu. They will say yes, he is

our father...I have a name...go and ask questions... how many barren wombs have I given children? How many impotent genitals have I resurrected? ...How many?" (Irobi, 2014, p49-50)

Because of the sacredness of the name, defiling the reputable name is detestable to him. As such, he worked hard to maintain the good name he had built over the years and known for. Maintaining and protecting that name requires that he follow the rules outlined in the moral code or the unwritten moral code that all traditional herbalists in Africa are aware of. Protecting the name comes with benefits. Importantly, he gains the respect and trust of the people. It is the moral ethics with its pseudo-sacred undertone that moderates his psychomoral disposition as a health practitioner (Kekeghe, 2012). As an herbalist, working under the code of conduct of his profession, Otagburuagu is obligated to be responsible to his patients. He would not collect money from patients until the patient is fully recovered. His patients are more important to him than money and himself. He values his reputation over financial gains.

"Ogidi: The mad boy's mother wants to know if she can go" (Irobi, 2014, p. 62).

Otagburuagu: Yes she can, she will pay when the boy is totally cured" (Irobi, 2014, p. 62).

It is evident that Otagburuagu is not ignorant of the canons and ethics of health care practice especially as it relates to herbal practitioners who are called by the gods to serve the people. This moral code has helped to moderate his professional activities over the years. This is further revealed in his utterances. "I do not procure abortions!..." (Irobi, 2014, p11). Awareness of this moral ethical code "is supposed to foster a psychosocial import, especially, as it helps to humanize physicians and clinicians. As any who breached the ethics, lives with a fierce sense of guilt and mental torture" (Kekeghe, 2021, p.179). While Ogidi, his apprentice reminds Otagburuagu of the affluent life medical doctors live, he is committed not to breaking the code of ethics of his profession. He however relates the illustrious life of these young doctors to a breach of the code of conduct of the profession- procurement of abortions.

Further, Herbalist Otagburuagu, in his years of practice understands that when a gravid mother is in distress and not duly attended to it will further result in maternal distress and in such case the evacuation or removal of the foetus is non-negotiable, if the foetus is more than 24wks of gestational age, as the case of Nketa, the foetus might survive in an incubator with comprehensive care, however, in this case, there is no such provision. Comprehensively, the bottom line is, that whether there is equipment or comprehensive care to handle

the early evacuation of the foetus of Nketa, the foetus must be evacuated in order to attend to the mother properly which Otagburuagu did.

The condition of Nketa, when she arrived, is a dire one that needs emergency and swift intervention. Nketa is bleeding heavily, possibly gasping and panting, showing severe hemorrhage that can lead to shock which could also lead to the foetus dying. The situation Otagburuagu finds Nketa makes it very difficult for him to allow her to die. As an herbalist assisting Chukwu (God), his obligation is not only to be concerned about the lives of patients but to put their interests first which is a requirement in the moral code. Part of rescuing Nketa is the evacuation of the foetus. Otagburuagu knows that the foetus is like a parasite that collects blood, oxygen, and food from the mother, and in Nketa's situation, she no longer has the capacity to supply such again. Since it is established that the evacuation of the foetus is inevitable, and Nanimgaebi and the other patient relatives have given consent to evacuation, the attending herbal doctor, Otagburuagu, acted by placing a root in-between her legs and the foetus is evacuated to save the mother. In this case, the patient's relatives were the ones who gave consent to remove the foetus. Also, the people trust that he can save Nketa. Therefore, Otagburuagu ensures that Nketa is kept alive no matter the severity of her health condition.

Though resisted saving her life at first, he saw the need to do so after much pleading from the patient relatives. He made sure the patient was alive and healthy. For Otagburuagu, his job at that point in time was made easier by Nketa's relatives who made him forget the cultural and moral ethics guiding his profession. He acted to save Nketa's life.

From this line of thought, Nanimgaebi reminding Otagburuagu of an unethical practice he begged him to engage in four years (4 years) after, is a clear case of blackmail. In another sense, the moral code of conduct permits the patients to choose treatment by themselves. However, when the patient cannot make choices for themselves, the patient relative makes the choice by giving consent to the physician.

"Otagburuagu: ... remember how you pleaded for four hours. That girl would have died. She was panting to death, and bleeding too. You all besieged me and pelted me with all the please, please, and please. One of the women you invited to beg said I should remove the child and save the life of the mother instead of watching two souls die. What could I do? I placed the root, she ejected it. You were the midwife, Nanimgaebi. Why did you now turn to accuse me?" (Irobi, 2914, p52).

Nanimgaebi succeeded in making Otagburuagu feel guilty. His guilt is based on the

fact that he completed an abortion process-a fully formed foetus. An act he had always stood against. He thinks he has committed an unpardonable sin. This feeling of guilt by Otagburuagu, no doubt is triggered by his consciousness of the tenets of the unwritten moral code of ethics, which he vow to uphold as a physician (Kekeghe, 2021) when he was called by 'Chukwu'.

The strange voices of "you killed him" (Irobi, 2014, p. 66) which Otagburuagu begins to hear is a reminder of the unethical indulgences of medical practitioners, and the need to maintain the moral principles of the herbal calling. After constant reminders of the breach of the standard code of the profession's ethics, he said:

"Otagburuagu: ...that nymph, that wayward girl, that wilderness of lust is the cause of all these things. If I had not saved her life, no one would have dragged my feet into this swamp of shame, no one! How many wombs have tottered into the tomb trying to eject the tenant who lives for nine months in the womb...? Even kindness wants to ruin me. A man stays in his house, practicing his trade, a stranger walks in and forces him to do a thing against his will, against his conscience, against the rules of his trade, against the calling of his gods. He refuses. Then, the whole world begs him on... what one man can fight the entire world? Now the deed is done and I have to

bear the guilt alone... globules of guilt hang on my chest like gold hang on the neck of the rich (Irobi, 2014, p. 64-65)".

Otagburuagu expresses his disgust over the violations of his professional ethics, of which he is an accomplice. Like the character, Miguel in Emmanuel Babatunde Omobowale's play, *The President's Physician* (2004), Otagburuagu's whole being, was gradually drawn into a vicious cycle of destruction. Although he detested what he was doing he had no choice but to do the will of the patient's relatives and to save the life of Nketa.

Another dimension to the discussion is whether Otagburuagu is involved in the termination of the foetus (aborticide). Nketa has tried to terminate her seven-month-old pregnancy. In this case, Nketa's foetus may have been dead on arrival (IUFD - intrauterine foetal death) and she is bleeding. Therefore, as mentioned before, Nketa's condition is a dire situation that needs emergency intervention because she might go into Hemorrhagic shock. In this instance, Otagburuagu thinks that part of the intervention to save Nketa will be to evacuate the foetus. There is evidence that Nketa had already terminated the foetus with the assistance of abortion clinic doctors, or with over-the-counter medications, and she is in this emergency because of complications arising from the termination of the foetus. Hence, the relative pleaded with

Otagburuagu to break the ethics of his profession and expel the foetus in order to save the life of Nketa. In a sense, the only way Otagburuagu can proceed with the evacuation is with the consent of the patient's relative which he got.

Although, foetal evacuation is not just the best option medically to save Nketa's life, it is part of the intervention that will be given to save her life. If not done within a reasonable time frame, it would lead to the demise of the host (Nketa). Nketa was bleeding when she arrived at Otagburuagu's place. She was not bleeding because she fell. She was bleeding as a result of the termination of the foetus, which is very common. Reasons for bleeding after termination (which is the real abortion), include a punctured uterus, lacerated placenta, and retained product of conception. In this case, the causes for bleeding can't be handled properly without evacuating the foetus whether dead or alive. One could argue that, since Nketa had tampered with the foetus before arriving at Otagburuagu's facility, his intervention involved the expulsion of retained products of conception, which was therapeutic to save the mother's life. In this instance, Otagburuagu no longer commits aborticide. This is because he was not involved in the termination of the foetus in the first instance. He only expelled because the foetus was not active when Nketa arrived. Nanimgaebi only makes it seem that the two

souls were alive on arrival to blackmail Otagburuagu to eliminate Ezenwoke in order to make him return to the parliament house unopposed.

But is it within Otagburuagu's jurisdiction as an herbalist to evacuate a foetus dead or alive? However, should he have allowed his patient to die when he could have saved her? The main question that needs interrogation at this point is whether Otagburuagu is qualified to carry out foetal evacuation.

Otagburuagu is an herbalist who diagnosed foetal demise using traditional methods. That he feels Nketa's foetus is inactive on arrival does not mean the foetus is dead. On the other hand, Nanimgaebi an enlightened man who was a member of parliament at the time deceived Otagburuagu, a perceived illiterate, to carry out an abortion on Nketa. Nanimgaebi is responsible for the pregnancy. He took Nketa to a patent medicine dealer referred to in the text as doctors who gave Nketa a medication to induce abortion. Obviously, Nanimgaebi was afraid of being exposed if he took Nketa to an Orthodox hospital as a likely diagnosis of abortion would be made and investigated.

Further, Otagburuagu acted on sentiment. The ethics of his profession disqualifies him from engaging in the act. Instead of directing them to an Orthodox hospital, he viewed himself as a saviour and completed an abortion

process. He played into the hand of Nanimgaebi whom he (Otagburuagu) thought was doing a favour. Nanimgaebi, and other relatives pleaded for the evacuation to be carried out to save Nketa's, thereby giving verbal consent. However, in this instance, one cannot be talking about consent to deliver an already dead foetus per vagina. The consent is likely to complete an abortion process which is a crime in their jurisdiction. Nanimgaebi is a key accomplice, and the relatives.

The actions of Otagburuagu are a classic case of an herbalist who doesn't recognize his limitations, plays heroic, acted on sentiments instead of following due process. This happens every day in Nigeria, where traditional bone setters would complicate bone fractures before referring them to the hospital, traditionalist who treat infertility by inserting herbs into their client's vaginal predisposing them to serious infections, those who diagnose a non-existing pregnancy and give herbal treatment to women who are not pregnant but probably has an ovarian cyst, those who take difficult deliveries blindly, perhaps on patients running away from cesarean sections thereby causing woes.

Conclusion

The study concludes that Esiaba Irobi's drama, *The Colour of Rusting Gold*, almost perfectly x-rays the everyday challenges med-

ical personnel's face in their practice in Nigeria. And second, the unethical involvement in medical cases by herbalists. The study linked the rules of traditional herbal practice with the orthodox moral code built in Hippocratic Oath is indispensable in general health practice, whether traditional or orthodox. Irobi uses the text to set boundaries for herbalists in their healthcare practice, and, significantly to improve ethics in medical practice.

Esiaba Irobi uses the play to show the psychological dilemma Otagburuagu, an African herbal doctor faced in the bid to save the life of a woman who is bleeding due to incomplete abortion. Otagburuagu is faced with deciding to uphold the ethics of his profession versus terminating a seven-month-old foetus to save the mother's life. Otagburuagu struggle in the face of guilt for not upholding the ethics of his profession. The text shows him defying his conscience and professional ethics to save the life of Nketa. Only to be accused of aborticide four years after by Nanimgaebi. This study highlights the difficulties and challenging decisions care providers, especially doctor's face and make daily to save lives. Many have suffered emotional and psychological trauma for defying the moral ethics of their profession. Others have been prosecuted for going against the law to save lives.

Limitations and Future perspectives

When all medical reports show that the foetus is no longer viable, it would be ethical for medical doctors to be allowed to consider therapeutic abortion to stop bleeding and save the mother's life. However, there is a need to raise awareness among herbalists about their limitations in healthcare practice through the art. Because people have over the years developed a measure of trust in herbalists, it would rather seem mean or impossible to recommend elimination. Concerning this issue, it should be the responsibility of representatives of specialized medical organizations to develop and provide a particular code of ethics for herbalists. There should be widespread public education on the importance of seeking medical care in orthodox hospitals. Television and radio stations could facilitate this through agenda-setting strategies.

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