

# Fields, Networks, and Flow: The Complex Adaptive System of the Jazz Jam Session

## 1. Introduction

Jazz jam sessions have long occupied a mythological space in historical discourses and public imagination—a smoke-filled room where spontaneous genius erupts without a script, characterized by a lack of formal boundaries and a spirit of egalitarian creative freedom. Yet, for the practitioner and the scholar, jam sessions are less a site of unchecked »freedom« and more a sophisticated regulatory apparatus (Pinheiro, 2013). As DeVeaux (1997) suggests, the evolution of jazz cannot be divorced from the professional environments and commercial infrastructures that birthed it. Jam sessions, therefore, function as the essential »proving ground« of the jazz ecosystem. They are the primary site where the internal logic of musical improvisation meets the external pressures of social hierarchy, reputational risk, and professional gatekeeping (Berliner, 1994; Pinheiro, 2011).

Despite their ubiquity in global creative hubs, jam sessions occupy a central yet analytically under-

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### Abstract – Résumé

Jazz jam sessions are historically idealized as informal performative occasions for spontaneous, unmediated expression. However, this study draws on ethnographic evidence from the New York jazz scene to demonstrate that these gatherings function as highly structured, integrated regulatory systems that are essential to the cultural, social, and economic realms of the jazz world. By synthesizing Pierre Bourdieu's Field Theory, Social Network Analysis, and Distributed Cognition models, this article conceptualizes the jam session as a complex adaptive system. The analysis identifies a triadic feedback loop in which micro-level musical interactions (distributed cognition) scale up to form meso-level relational structures (social networks), which are subsequently regulated by macro-level hierarchies and stylistic norms (the field). Through mechanisms such as the »Virtue Loop« and the »Regulatory Brake,« jam sessions function as high-frequency filters that manage capital conversion and gatekeep professional mobility. This research ultimately positions the jam session not as an informal byproduct of the scene, but as a central institutional engine that ensures the survival and transformation of jazz culture in the 21st century.

**Keywords: jazz • improvisation • jam sessions • social networks • cultural sociology • ethnomusicology**

theorized performative occasion in jazz studies. While they are frequently described in popular discourse as informal and spontaneous gatherings, longitudinal ethnographic research demonstrates that they are, in fact, highly structured environments governed by strict implicit norms, hierarchical relational configurations, and rigorous evaluative processes (Pinheiro, 2011, 2012, 2013). These sessions do not merely provide a stage for performance; they serve as a critical socialization mechanism where the jazz *habitus*<sup>1</sup> (Bourdieu, 1977, 1993) is calibrated through legitimate peripheral participation<sup>2</sup> (Lave & Wenger, 1991). In this context, the jam session functions as a laboratory for »situated learning,« where novice players internalize the community's standards through observation and interaction with more experienced members (Green, 2002).

To understand jam sessions is to understand the mechanism of the jazz world's self-regulation. By operating as a high-frequency filter for talent and social reliability, the session manages the inherent tension between individual innovation and the preservation of a canonical tradition—a process Monson (1996) identifies as the interjection of social meaning within musical interaction (p.188). This article seeks to deconstruct the »myth of spontaneity« by providing a multi-scalar synthesis of the jam session's functions. We move beyond a purely musicological analysis of the notes played to examine the broader sociological and cognitive structures—drawing on Distributed Cognition (Hutchins, 1995) and Network Theory (Scott, 2017)—that allow these sessions to function as the »engine room« of the jazz field. By balancing creative emergence with the conservative necessity of stylistic and professional policing, the jam session ensures the survival of jazz as a distinct and self-correcting cultural field.

### *The Jam Session as a Complex Adaptive System*

This article conceptualizes jam sessions not merely as peripheral social gatherings, but as an integrated regulatory system. Within this framework, the session is defined as a complex adaptive system—a dynamic network of agents whose localized interactions produce emergent global properties that cannot be understood by examining the individuals in isolation. This performative occasion

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<sup>1</sup> According to BORDIEU (1977), *habitus* refers to »a subjective but not individual system of internalised structures, schemes of perception, conception, and action common to all members of the same group or class« (p.86).

<sup>2</sup> Situated learning is the idea that learning happens mainly through social interaction and participation with others. The authors argue that learning is best understood as an activity that takes place within real social and cultural contexts. A key part of this process is what they call legitimate peripheral participation (LPP), where newcomers begin by taking on small, less central roles within a community of practitioners and gradually become more fully involved in the community's shared practices and ways of thinking.

manages several competing aesthetic, social, and economic vectors through a series of non-linear, dynamic feedback loops. We propose that jam sessions function through the integration of three interdependent dimensions, each operating at a different scale of reality.

The first of these is Improvisational Flow, representing the micro-cognitive layer. This is the site of real-time musical generation, where the ensemble functions as a single cognitive unit. Drawing on the concepts of »distributed creativity« (Sawyer, 2003) and »distributed cognition« (Hutchins, 1995), we observe that the computational load of the music is shared across the group. Here, interactional synchrony and »musical dialogue« (Pinheiro, 2012) serve as the system's generative engine, producing the raw aesthetic material of the system through »enactive« processes<sup>3</sup> (Noë, 2004).

Connecting the individual to the collective is the Social Network dimension, or the meso-structural layer. This stratum encompasses the relational structures that emerge from shared performance, facilitating the flow of information and professional intelligence. By operationalizing Granovetter's (1973) »strength of weak ties,« this layer treats musicians as nodes whose value is determined by their centrality and brokerage power<sup>4</sup> (Burt, 1992) within the scene. In this layer, the jam session acts as a high-density network hub that converts reputational »signals« into labour market opportunities.

Finally, the Evaluation dimension constitutes the macro-sociological layer. This dimension comprises the »unwritten rules,« stylistic norms, and the historical »cutting contest« tradition that act as a high-frequency filter. These mechanisms assign »symbolic capital« and prestige within the »field of cultural production« (Bourdieu, 1993) to validated performances while excluding those who fail to meet the community's rigorous standards. This evaluative process creates a context of performance regulation that ensures the reproduction of the jazz *habitus* (Pinheiro, 2013).

Rather than operating independently, these three dimensions form a triadic feedback loop that ensures systemic equilibrium. In this recursive process, micro-level musical performance shapes one's meso-level social position; subsequently, that network position dictates macro-level professional opportunity. Finally, the evaluative mechanisms of the field act as the gatekeeper, regulating who is

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<sup>3</sup> The enactive approach to perception, especially as articulated by philosopher Alva NOË in his 2004 book *Action in Perception*, argues that perception is not simply the brain passively constructing a three-dimensional world from two-dimensional retinal images. Rather, perception is an active, embodied skill—something we actively engage in through bodily interaction with the world, not something that merely happens to us.

<sup>4</sup> Brokerage power, as defined by Ronald BURT in *Structural Holes: The Social Structure of Competition* (1992), refers to the competitive advantage gained by individuals who bridge »structural holes« in a social network. Structural holes are gaps between non-redundant contacts—meaning they are the absences of direct connections between separate groups or social clusters.

granted access back to the stage to perform again. By viewing jam sessions through this integrated lens, we move beyond the binary of »art vs. business« to see a singular, dynamic system where musical creativity, social interaction, and structural constraints are fundamentally inseparable—a self-regulating engine that maintains the integrity of the jazz field while allowing for constant creative emergence.

### *A Multidisciplinary Synthesis*

While traditional ethnomusicology has extensively documented the cultural history and interactional aesthetics of jazz performance (Berliner, 1994; Monson, 1996; Jackson, 2000; Faulkner & Becker, 2009), and cognitive science has explored the internal mechanics of »flow« and individual improvisation (Csikszentmihalyi, 1990; Pressing, 1988), there remains a significant gap in understanding how these disparate layers interact to sustain the jazz community as a self-regulating sociological system. Drawing on my extensive ethnographic fieldwork (Pinheiro, 2011, 2012) in New York jazz scene jam sessions, this study proposes a multi-scalar synthesis that integrates Bourdieu's Field Theory with Social Network Analysis (Scott, 2017) and Distributed Cognition (Hutchins, 1995).

By analysing the jam session through these intersecting lenses, we can observe how micro-level musical choices—such as the selection of a specific »standard,« the use of particular harmonic substitutions, or even the decision to end a solo—function as strategic signals within a competitive network (Pinheiro, 2012). These signals are not merely aesthetic; they are »moves« within a field of cultural production (Bourdieu, 1993) that serve to either reinforce or challenge the existing social structure. Within this framework, the bandstand becomes a site of »enactive cognition« (Noë, 2004; Thompson, 2007), where the musician's physical engagement with the instrument and the ensemble constitutes a form of social intelligence that is immediately evaluated by the community.

This article argues that the jam session is the central institution where the *habitus* of the jazz musician—the »durably installed generative principle of regulated improvisations« (Bourdieu, 1977, p.78)—is both formed through situated learning (Lave & Wenger, 1991) and tested through public performance. By facilitating the conversion of cultural capital (musical skill) into social capital (network ties) and eventually symbolic capital (prestige and professional legitimacy), jam sessions operate as a »structural hole« (Burt, 1992) or a bridge between the private practice room and the global jazz market. This makes the jam session essential not only to the reproduction of stylistic norms but to the continuous, self-regulated transformation of jazz culture in the 21st century.

### *Theoretical Pillars*

The analysis presented in this study relies on four primary theoretical frameworks, creating a multi-scalar perspective that bridges the gap between individual psychological states and macro-level social structures.

First, Sociological Field Theory provides the structural foundation for understanding the jam session as a competitive arena. By utilizing Bourdieu's (1977, 1990) concepts of *habitus* and field, we can explain how musicians navigate the landscape of this performative occasion not as randomized agents, but as actors with deeply internalized historical and stylistic dispositions. Within this »field of cultural production« (Bourdieu, 1993), every musical choice becomes a form of strategic positioning intended to accumulate symbolic capital. The jam session acts as a high-stakes site where this capital is contested and redistributed, serving to reproduce the social hierarchies of the jazz world (Pinheiro, 2013).

Second, Network Theory is applied to analyse the relational structures that define professional mobility. Rather than viewing the jazz scene as a monolith, we apply Social Network Analysis (Scott, 2017) to understand how jam sessions act as critical hubs or »structural holes« (Burt, 1992) between disparate jazz sub-groups. By facilitating the »strength of weak ties« (Granovetter, 1973), these sessions allow musicians to bridge localized cliques, converting interactional synchrony into tangible professional intelligence and labour market opportunities (Watts & Strogatz, 1998).

Third, ethnomusicological perspectives on jazz musical interaction frames the aesthetic dimension of jam sessions. Building on Berliner's (1994), Monson's (1996) and Jackson's (2000) contributions, we view musical interplay as a sophisticated form of social discourse.<sup>5</sup> This perspective treats improvisation as a communicative act where meaning is negotiated through »intermusicality« (Monson, 1996) and the shared cultural knowledge of the African American expressive tradition (Jackson, 2000). This dialogue is governed by what Goffman (1983) terms the »interaction order,« where the micro-level etiquette of the bandstand mirrors the broader ethical and social values of the jazz community (Berliner, 1994; Faulkner & Becker, 2009).

Finally, Distributed Cognition provides the cognitive architecture for the »Complex Adaptive System.« Viewing the bandstand as a singular cognitive unit, we draw on Hutchins (1995) to argue that musical knowledge, memory, and real-time problem-solving are shared across the ensemble rather than residing in a single individual. This »cognition in the wild« allows for the navigation of complex harmonic and rhythmic structures without centralized leadership, relying instead on interactional synchrony and embodied cognition (Varela, Thompson,

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<sup>5</sup> Also see PINHEIRO (2020).

& Rosch, 1991; Shapiro, 2011). In this sense, the bandstand functions as a laboratory for »group creativity« (Sawyer, 2003), where the ensemble's collective intelligence emerges from the coupling of biological agents and their instruments.

## 2. Literature Review

### *Reframing Jazz Improvisation: From Individual Expression to Social Process*

Early jazz scholarship—often rooted in a »Great Man« theory of history—emphasized the soloist as a site of isolated, spontaneous genius, a narrative that prioritized individual psychology over collective practice. However, contemporary research has fundamentally deconstructed this myth of the unmediated (Monson, 1996), arguing that the romanticized image of the lone creator obscures the complex social and material conditions required for musical production. Paul Berliner's (1994) seminal work, *Thinking in Jazz*, redefined improvisation as a rigorous, structured practice. The author illustrates that the performer does not create *ex nihilo* but draws upon an internalized »storehouse« of melodic formulas, harmonic patterns and substitutions, and rhythmic cycles—a process that involves years of disciplined socialization and communal learning.

Ethnomusicologists have played a decisive role in this reframing by shifting the analytical focus from the transcribed »text« of a solo to the socially situated performance. Ingrid Monson (1996) famously argued that musical interplay is a form of social discourse, where the rhythm section and soloist engage in a communicative »saying something« that mirrors the call-and-response patterns of African American speech communities. This perspective is complemented by the work of Christopher Small (1998), whose concept of »musicking« asserts that meaning is not found in the musical object itself but in the totality of the social relationships generated during the performance. In the context of jam sessions, ethnomusicological inquiry reveals that the »music« includes the way players acknowledge one another on stage, the supportive »comping« that facilitates a peer's solo, and the shared cultural memory invoked by specific quotes from the jazz canon (Pinheiro, 2011).

This perspective is significantly extended by Keith Sawyer's (2003) concept of »collaborative emergence,« which posits that in group improvisation, the whole is greater than the sum of its parts. In this »interactional system,« no single participant can fully predict the musical outcome, as each gesture is contingent upon the preceding one in a chain of interactional synchrony. This mirrors what Lewis (2004) describes as the »Afrological« approach to improvisation, which emphasizes personal narrative within a collective, multidominant space.

Furthermore, the improvisation process is increasingly viewed through the lens of embodied and enactive cognition (Leman, 2008; Schiavio & De Jaegher,

2017). Here, the musical act is not a disembodied mental calculation but a »sensorimotor coupling« between the musician, the instrument, and the ensemble. This idea is reinforced by noting that the creative process is »informed by the social and cultural settings« that configure the performance, suggesting that the physical architecture of the jam session acts as a set of environmental constraints on musical choice (Pinheiro, 2011, 2012).

Thus, improvisation is reframed as a socially distributed labour (Hutchins, 1995). Within this framework, innovation is not an individual whim but a collective negotiation governed by what Faulkner & Becker (2009) call the »social system of the ensemble.« Every solo is a micro-negotiation with the tradition (the field), the current collaborators (the network), and the immediate audience (the evaluative filter). This transition from a psychological model of individual »flow« to a sociological model of interactional competence aligns with Becker's (1982) »art worlds« perspective, where the individual's aesthetic output is ultimately a product of collective action and institutionalized norms.

#### *Jam Sessions and Ethnomusicology: Learning, Practice, and Socialization*

Jam sessions serve as the primary extracurricular laboratories for jazz socialization, acting as the critical bridge between theoretical knowledge and professional reality. While modern conservatories and academic institutions provide a wealth of technical data—such as harmonic theory, historical analysis, and instrumental proficiency—jam sessions provide performative enculturation. This distinction is vital: the university teaches the *what* of jazz, but the jam session teaches the *how* and *why* of being a jazz musician. In this sense, the session functions as a site of »musicking« (Small, 1998), where the meaning of the activity is found in the totality of the social relationships it generates.

Drawing on Lave and Wenger's (1991) theory of situated learning, these sessions function through a process of »legitimate peripheral participation.« In this model, a newcomer (the apprentice) enters the community from the periphery—often starting as a silent listener or a cautious participant—and gradually moves toward full participation as they internalize the community's standards. A newcomer does not simply learn musical notes; they learn the complex social grammar of the scene: when to »sit in,« how to signal a »turn« or »trade fours,« and how to interpret the aggressive or supportive musical gestures of peers. This is what I identify (Pinheiro, 2012) as a privileged context for the acquisition of the jazz *habitus*, where the musician learns to navigate the interaction order (Goffman, 1983) of the bandstand through direct experience.

This form of learning is inherently »low-instruction but high-stakes.« Unlike the classroom, where failure is met with a grade, failure in the jam session results in social and professional peripheralization—what we might call the »Regulatory

Brake.« The jam session functions as a holistic training environment where the musician develops what Goodwin (1994) terms »professional vision«—the ability to see and hear musical possibilities within the specific constraints of the jam environment. It involves the development of »tacit knowledge« (Polanyi, 1966) that cannot be codified in a textbook, such as sensing the »emotional temperature« of a rhythm section or knowing which »musical approach« is appropriate for a specific kind of repertoire or venue’s lineage.

Ultimately, it is in this high-pressure environment that the musician’s identity is forged through the management of performance risk. As Monson (1996) notes, the ability to »say something« requires more than technical facility; it requires an understanding of the intermusicality and cultural tropes shared by the community. Through the navigation of these subtle social cues, the player moves from being an outsider to a »recognized« member of the network. As Wacquant (2004) observed in his study of »carnal« apprenticeship, this is a form of embodied socialization; the musician does not just learn to play jazz, they learn to *become* a jazz musician, internalizing the community’s values of resilience, interactional agility, and »respect for the tradition.«

### *Art Worlds and Collective Coordination*

Howard Becker’s *Art Worlds* (1982) demystifies the romanticized image of the »rebel« artist or the isolated genius by arguing that art is not the product of a single individual, but a collective action made possible by an elaborate network of cooperative links and shared conventions. In jam sessions, these conventions act as the »social glue« and the »technical shorthand« that allow complete strangers to perform with high degrees of coherence, without a single moment of group rehearsal. This collective coordination is maintained through several key mechanisms that stabilize the performance environment.

First, the »Great American Songbook« and the bebop canon function as what Star and Griesemer (1989) term »boundary objects.« These are artifacts that are plastic enough to adapt to local needs—such as varying tempos or re-harmonizations—but robust enough to maintain a common identity across different stylistic backgrounds. Because every participant shares a mental map of »Autumn Leaves« or »Blue Bossa,« they can cooperate across linguistic or generational divides, using the tune as a stable platform for divergent creative explorations. This shared repertoire minimizes the need for explicit verbal communication, allowing the music to proceed through a foundation of mutual expectation (Pinheiro, 2011).

Furthermore, the jam session relies on coordination protocols that prevent system collapse into musical chaos. Rituals such as established solo orders,

»trading fours,« and standardized physical cues—like a head-nod to signal the »out-chorus«—are not merely aesthetic choices but essential tools for managing the »interaction order« (Goffman, 1983; Pinheiro, 2012). Following Lewis’s (1969) theory of convention, these rules persist because they solve recurrent coordination problems within the ensemble. Despite their outward appearance of informality, these events are highly structured environments (Pinheiro, 2012). By adhering to these implicit rules, musicians minimize the cognitive load associated with basic coordination. This structural efficiency allows them to redirect their finite mental energy away from the »mechanics« of the song and toward the creative »edges« of the performance, facilitating the state of »collaborative emergence« (Sawyer, 2003). Ultimately, the »freedom« of the jam session is a product of rigorous constraint; the most spontaneous art rests upon a foundation of invisible, collective organization and reorganization, and the shared »storehouse« of musical formulas (Berliner, 1994).

### *Field Theory: Capital, Hierarchy, and Struggle*

While Becker’s *Art Worlds* framework illuminates how musicians work together through shared conventions, Pierre Bourdieu’s (1993) Field Theory provides the necessary lens to understand how they compete. The jam sessions are a micro-field—a structured social space with its own internal logic, where participants vie for »symbolic capital« (prestige and recognition). In this arena, technical virtuosity and stylistic fluency are not merely aesthetic expressions; they are claims to position within a shifting social hierarchy.

The struggle for dominance within this field is often manifested in the »cutting contest.« Historically rooted in the competitive sessions of Kansas City and Harlem, and persisting in contemporary forms, the cutting contest is a ritualized struggle for dominance (Berliner, 1994). Here, the bandstand becomes a site of »agonistic« play where musicians test their mettle against one another. To survive the contest, a player must possess a specific *habitus*—a set of »dispositions« that allow them to react instinctively to musical challenges. This competition serves as a high-frequency filter, separating those who possess the required cultural capital from those who do not.

Within this micro-field, musicians must navigate the tension between distinction and conformity. To gain legitimacy, one must demonstrate »orthodoxy« by respecting the »rules of the game«—playing the changes correctly, maintaining the pulse, and respecting the canon. However, to accumulate significant symbolic capital, one must also introduce »heterodoxy«—innovating or »subverting« expectations to stand out from the crowd. This delicate balance is what Bourdieu (1984) describes as the struggle for distinction.

The jam session functions through a mutual recognition of musical capacity (Pinheiro, 2012, 2013). This recognition acts as a potent gatekeeping mechanism; the peers on the bandstand, rather than a formal board of directors, decide who is granted »the right to speak.« The jam session thus acts as a regulatory filter, determining who is »in« and who is »out« based on their ability to performatively demonstrate specific forms of cultural capital. By internalizing these hierarchies, musicians learn that their professional survival depends as much on their social positioning within the field as it does on their individual creative whim.

### *Interaction Order and the Micro-Sociology of Performance*

The bandstand at jam sessions is not merely a stage for musical exhibition; it is a site of intense impression management where the »Interaction Order« (Goffman, 1983) is maintained through a delicate dance of non-verbal cues. Within this micro-sociological framework, musicians use »musical talk«—a specialized form of face-to-face signalling—to manage the trajectory of the encounter (Pinheiro, 2012). A tilted head, a specific glance toward the drummer, or a rhythmic »push« are all strategic manoeuvres intended to sustain the »line« of the performance and ensure that all participants remain »in character« as competent professionals.

Following the principles of Symbolic Interactionism (Blumer, 1969; Mead, 1934), meaning within the jam session is never fixed; it is perpetually negotiated through the actions and reactions of the participants (Pinheiro, 2011). In this interactional system, a dissonant note is not an »error« in any objective sense; it only becomes a mistake if the rest of the ensemble fails to respond to it or if the soloist fails to »frame« it within a logical sequence. If the rhythm section »picks up« the dissonance and provides a harmonic context, the supposed error is instantly re-categorized as a bold creative choice. This demonstrates that musical »truth« on the bandstand is a social construction, dependent on the intersubjective alignment of the performers.

I describe this phenomenon as a »musical dialogue« (Pinheiro, 2012, p. 132), emphasizing that the jam session is a lived system where social reality is co-constructed in real-time. This dialogue relies on what Sawyer (2003) calls »interactional synchrony,« where the timing of a gesture is as important as the gesture itself. For the jazz practitioner, this requires a high degree of social intelligence and the ability to engage in what Cross (2003) terms musicality as a social communication. Every moment on the bandstand is a micro-negotiation where the participants must balance their individual expressive desires with the collective need to maintain the »working consensus« of the performance.

Furthermore, this interactional order is governed by etiquette and ritual (Pinheiro, 2012). As Faulkner and Becker (2009) observe, the etiquette of the sit-in

involves a complex set of »face-work« strategies (Goffman, 1967). A musician must know how to assert their presence without »hogging the stage,« and how to exit a solo with grace to avoid »interactional breakdowns.« These micro-sociological processes ensure that the jam session functions as a stable social system, allowing for high-risk creative emergence while preventing the total collapse of social and musical order.

### *Social Network Theory and Opportunity Structures*

Beyond the immediate musical interplay on the stage, jam sessions function as a powerful social engine and a primary site for the accumulation of social capital. Utilizing Granovetter's (1973) seminal theory on the »Strength of Weak Ties,« we can see that the session serves as a unique platform where the rigid boundaries of the jazz hierarchy become temporarily porous. While »strong ties« (close friends and regular bandmates) provide emotional support, it is the »weak ties«—the acquaintances made during a brief sit-in or a conversation at the bar—that serve as the primary conduits for novel information regarding upcoming gigs, recording sessions, and teaching opportunities. In the precarious economy of the jazz world, these peripheral connections are often more valuable for professional mobility than one's immediate inner circle.

The jam session's architecture facilitates a specific type of social advantage known as brokerage. Session hosts and »house bands« often function as network brokers (Burt, 1992), strategically bridging »structural holes« between otherwise disconnected cliques or sub-scenes within a city's musical landscape. By occupying this middle ground, jam sessions allow an »up-and-comer« to gain visibility in front of »established« players who move in different professional orbits. This bridging function is essential for the »small-world« dynamics of the jazz scene (Watts and Strogatz, 1998), ensuring that talent can circulate through the system rather than remaining trapped within localized silos.

Consequently, jam sessions must be viewed as a critical labour market infrastructure. I explicitly link the session to the establishment of professional networks, positioning it as the office or the trading floor of the jazz industry (Pinheiro, 2013). In a field where formal job postings are non-existent and hiring is based almost entirely on reputation and peer recommendation, the jam session provides the necessary evaluative environment for talent scouting. Here, a musician's »hireability« is assessed not just through their technical proficiency, but through their social reliability—their ability to show up on time, respect the etiquette of the stage, and integrate seamlessly into a new network (Uzzi & Spiro, 2005). Thus, jam sessions transform musical performance into a form of professional signalling, where a successful chorus serves as a high-fidelity resume delivered in real-time.

*Cognitive Approaches: Distributed and Embodied Improvisation*

Modern cognitive science has undergone a »4E« revolution (Embodied, Embedded, Enactive, and Extended), effectively moving the »mind« out of the isolated skull and into the performance space. Within this framework, Distributed Cognition (Hutchins, 1995) suggests that the »memory« and »intelligence« of a jazz performance are not held by any single individual but are shared across the entire ensemble. The cognitive labour of maintaining the performance is offloaded onto the group: the drummer maintains the temporal architecture, the bassist stabilizes the harmonic structure, and the soloist navigates the melodic narrative. This creates a functional system where the ensemble operates as a single cognitive unit, capable of processing information and making split-second decisions that would exceed the capacity of an individual mind working in isolation.

Furthermore, the theory of Embodied Cognition (Shapiro, 2011; Leman, 2008) argues that a musician's thinking is fundamentally intertwined with their physical being. The concept of musical dialogue (Pinheiro, 2012, p.132) refers to an enactive process—musical knowledge is not a static mental state or a stored data point, but a dynamic way of acting in and engaging with the world. For the improviser, the instrument is not an external tool but an extension of the biological body, where the thought of a phrase is synonymous with the motor-sensory execution of it (Noë, 2004). This bodily intelligence allows the musician to bypass slow, deliberate conscious processing in favour of high-speed, intuitive responses to the environment.

Jam sessions are thus a distributed cognitive system where the »intelligence« of the performance emerges from the tight coupling of bodies, instruments, and social norms. In this high-intensity environment, musicians engage in participatory sense-making (Schiavio & De Jaegher, 2017), a process where the coordination of movement and sound between players creates a shared meaning that did not exist prior to the interaction. By viewing jam sessions through this lens, we see that the spontaneity of jazz is actually a highly sophisticated form of real-time collective problem-solving, governed by the biological and social constraints of the agents involved.

*Synthesis: Toward an Integrated Framework*

The existing literature provides a fragmented view: ethnomusicology gives us the *culture*, sociology gives us the *structure*, and cognitive science gives us the *process*. This article seeks to synthesize these into a Regulatory Systems Model.

We argue that jam sessions are a complex adaptive system where the micro-interactions of the bandstand (cognition/interaction) scale up to create the macro-structures of the jazz scene (networks/fields). These layers are linked by feedback

loops: a successful solo (musical interaction) leads to increased prestige (symbolic capital), which expands the musician's network (social capital), which in turn provides more opportunities for musical interaction.

Taken together, these perspectives suggest that jam sessions cannot be adequately understood through a single theoretical lens. Rather, they must be approached as multi-dimensional systems in which musical creativity, social interaction, and structural constraints are deeply intertwined. By synthesizing ethnographic evidence with field theory, network analysis, and cognitive approaches, this study develops an integrated model that captures the full complexity of jam sessions as central institutions in the reproduction and transformation of jazz culture.

### 3. Methodology

This study employs a multi-scalar synthesis, integrating qualitative ethnographic data with quantitative structural frameworks to provide a holistic view of the jazz ecosystem. The primary empirical foundation is derived from the longitudinal fieldwork I've conducted (Pinheiro, 2011, 2012), which utilizes a »triangulation« of methods to ensure both depth and reliability (Denzin, 1978).

The methodology is rooted in deep immersion within the New York jazz scene, a technique often described in ethnographic literature as »deep hanging out« (Geertz, 1998).<sup>6</sup> As mentioned in a previous article (Pinheiro, 2012), »I observed jam sessions in five venues located in three different areas in Manhattan« (p.133), a selection that represents a cross-section of the city's jazz geography, from central venues to more peripheral performance spaces.

This observation directs its focus toward the micro-interactional order (Goffman, 1983), effectively capturing the granular nuances that define the lived experience of the bandstand. Central to this order is the rigid yet unspoken stage etiquette that governs the sequence of soloing and the »calling« of tunes, ensuring a sense of structure within a supposedly spontaneous environment. These interactions are facilitated by a sophisticated language of non-verbal signalling, where eye contact, head nods, and specific musical cues serve as the primary tools for managing transitions and maintaining ensemble cohesion. Furthermore, the analysis considers the physical architecture of the venue, examining how the spatial layout of a club—such as the deliberate distance maintained between the bar and the bandstand—influences social stratification among participants and shapes the overall engagement of the listeners.

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<sup>6</sup> Clifford GEERTZ described »deep hanging out« as »localized, long-term, close-in, vernacular field research« (1998, p.69). The term refers to immersive, ethnographic fieldwork involving informal participant observation, where researchers deeply immerse themselves in a community's daily life to understand cultural meanings from within.

To complement observational data, the study incorporates semi-structured interviews with a diverse array of actors, including famous jazz musicians, session leaders, »house band« members, and itinerant participants. These interviews serve to decode the subjective values and implicit norms that govern the scene. By utilizing what Spradley (1979) calls ethnographic questions, the research uncovers the underlying folk taxonomies musicians use to categorize »talent,« »professionalism,« and »hipness.« These narratives provide the »emic« perspective necessary to understand why certain regulatory mechanisms persist as meaningful cultural rituals.

A distinctive feature of this methodology is the use of auto-ethnographic performance experience. By leveraging the researcher's »insider« status, the study accesses the embodied knowledge of the bandstand. This aligns with Wacquant's (2004) »carnal sociology,« where the researcher learns the craft to understand the social world from the inside out. Transitioning from a mere observer to a participant-perceiver allows for an analysis of the »gut feelings« and somatic responses that characterize high-pressure improvisational environments. This »enactive« approach (Noë, 2004) ensures that the cognitive and physical demands of jazz are not treated as abstractions but as lived realities.

Finally, the ethnographic findings are mapped onto formal models to bridge the gap between individual action and broader social structure. Social Network Analysis is used to translate observed patterns of shared performances into a social graph, allowing for the identification of key hubs and brokers (Scott, 2017). At the same time, Field Theory draws on Bourdieu's (1993) framework to conceptualize the jam session as a »space of positions,« in which the distribution of cultural and symbolic capital shapes each musician's trajectory. By synthesizing these different data points, the methodology moves from micro-level interactions—such as the notes played—to macro-level structural insights, including the formation of professional networks, thereby providing a robust empirical foundation for the analysis proposed in this article.

#### 4. Jam Sessions as Social and Regulatory Systems

As previously stated, jam sessions are far more than aesthetic events or recreational gatherings; they function as the primary regulatory hubs of the jazz ecosystem. Operating outside the formal confines of the conservatory or the high-stakes contract of the professional concert hall, they provide a liminal space where the boundary between amateur and professional is constantly negotiated. This study identifies three primary systemic functions that allow jam sessions to regulate the jazz field.

### *Socialization Environments and the Calibration of Habitus*

Jam sessions serve as the fundamental »onboarding« mechanisms for the jazz community. I characterize them as a context of socialization and integration of musicians into the jazz scene (Pinheiro, 2013). This socialization is not merely about learning songs; it is about the calibration of the jazz *habitus* (Bourdieu, 1977)—the internalizing of a specific set of dispositions, bodily gestures, and aesthetic values (Pinheiro, 2011, 2012).

In these environments, newcomers undergo a process of enculturation. They learn the »logic of practice« (Bourdieu, 1990) by observing how veterans stand, how they signal the end of a chorus, and how they navigate the social space of the club. This informal pedagogy is essential because of the centrality of »tacit knowledge« in jazz (Polanyi, 1966)—knowledge that cannot be fully articulated in textbooks but must be »caught« through proximity and imitation within a community of practice.

### *Evaluation Arenas: Performance as Public Trial*

Jam sessions are high-stakes evaluation arenas where musical performance is subjected to immediate peer review. I define this as a context of performance regulation, in which the bandstand functions as a metaphorical forum (Pinheiro, 2013). Unlike a private rehearsal, the session operates as a public trial, where evaluation is enforced through a spectrum of regulatory sanctions. At the micro level, these may take the form of a subtle grimace from a bandmate, a sudden shift in rhythmic feel—such as rushing the tempo to place pressure on a soloist—or the withholding of a customary »shout-out« or nod of approval. At the macro level, more overt forms of exclusion can occur in response to stylistic »heresy,« such as playing inappropriately out of key or overstaying one’s welcome on stage; in such cases, a session leader may intervene through practices like, as famously mythologized in the anecdote involving Charlie Parker and Jo Jones, the symbolic clashing of cymbals to signal failure. This regulatory pressure helps ensure that the community maintains a coherent aesthetic identity, while symbolic capital is conferred only upon those who demonstrate mastery of the canon (Williams, 1970; DeVeaux, 1991; Gabbard, 1995; Monson, 1995; Lopes, 2002; Ake, 2002; Porter, 2002; Tucker 2005; Hersh, 2008; Pinheiro, 2023).<sup>7</sup>

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<sup>7</sup> Across these works, a clear trajectory emerges: early efforts (e.g., Williams) establish a canon; DeVeaux and others critique its construction; later scholars (Tucker, Ake, Lopes) analyse its social, political, and institutional implications. The consensus is that the jazz canon is not neutral but historically contingent, negotiated, and contested.

*Network Hubs and the Marketplace of Social Capital*

Beyond the music itself, jam sessions function as structural network hubs (Pinheiro, 2013), facilitating what Mark Granovetter (1973) famously termed the »strength of weak ties.« While a musician's strong ties—close friends and regular bandmates—provide emotional support and stability, their weak ties, often formed in the fluid and informal setting of jam sessions, are statistically more likely to generate new professional opportunities. In this sense, the jam session operates as a marketplace for professional intelligence, where crucial information circulates alongside musical performance. During breaks between sets or while waiting for a turn to play, musicians exchange insights about job market dynamics, such as which bandleaders are seeking sidemen; reputational data, including who is reliable, who is considered »difficult,« and who has recently improved; and the distribution of resources, from rehearsal spaces to recording studios and teaching opportunities (Pinheiro, 2013). By bringing together musicians from different social and professional strata—linking emerging players with established »first-call« veterans—the jam session effectively bridges what Ronald Burt (1992) conceptualized as structural holes within a network. As a result, it becomes a key site where social capital is actively converted into economic opportunity, making it an indispensable component of the jazz labour market.

**5. Improvisation as Distributed and Embodied Cognition**

Improvisation is frequently mischaracterized in popular discourse and early psychological models as a high-speed internal mental calculation—a soloistic »information processing« task occurring within the confines of a single mind. However, drawing on contemporary cognitive science and ethnographic evidence, this article argues that jazz improvisation is a distributed cognitive process that transcends the individual agent.

As I observed through fieldwork in New York (Pinheiro, 2012), musicians improvise, developing a musical dialogue. This dialogue is not merely a metaphor; it is the visible manifestation of distributed cognition (Hutchins, 1995). In the high-pressure environment of a jam session, the »computational« load of a performance—maintaining the underlying pulse, navigating complex harmonic cycles, and tracking structural markers—is spread across the ensemble.

In this system, the »mind« of the performance is not located in any one musician but is emergent from their interaction. The bassist and drummer act as a »rhythmic anchor,« freeing the soloist to explore melodic tensions. This division of labour allows the system to handle higher levels of complexity than any individual could manage in isolation. The bandstand, therefore, functions as a coupled system, where the cognitive state of one musician is constantly being updated and modified by the output of the others.

A critical component of this cognitive system is that jazz knowledge is rarely stored as abstract, propositional data but is instead embodied (Shapiro, 2011). A musician's fluency during a jam session relies heavily on their hearing abilities and motor memory—harmonic patterns and scales are stored as physical pathways and tactile responses rather than mental charts.

This is further supported by gestural cues, such as the tilt of a saxophone, the intensity of a drummer's stroke, or a sudden change in posture, which communicate musical intent to bandmates more rapidly than symbolic thought. This embodied dimension explains how musicians navigate a »tune« at extreme tempos, as the sheer speed of the interaction exceeds the limits of conscious, deliberative reflection. Ultimately, the body »knows« the repertoire through years of physical repetition and study, which liberates the conscious mind to focus on the subtle interactional nuances of the performance.

Building on enactive cognition (Noë, 2004; Varela et al., 1991), this study posits that musical meaning is not »processed« but »enacted« through action. In a jam session, a phrase's significance is not only inherent in the notes played; its meaning is also determined by how the ensemble responds in the moment.

The musical dialogue is an ongoing negotiation (Pinheiro, 2012). If a soloist plays a dissonant »outside« note and the pianist supports it with a complementary chord, the note is enacted as a »sophisticated« artistic choice. If the ensemble fails to respond, the same note might be perceived as an error. In this sense, the boundary between individual agents becomes porous; the soloist is thinking with the rhythm section, and the rhythm section is thinking through the soloist. The jam session is thus the ultimate expression of cognition-in-the-wild, where musical intelligence is a property of the collective interactional system.

## 6. Network Structure and Metrics

By modelling the jam session through the lens of Social Network Analysis, we can begin to portray the actual social architecture of the jazz scene. In this framework, jam sessions act as a network generator, where every »sit-in« constitutes a data point in a complex web of professional and artistic affiliations.

In our structural model, the jazz scene is visualized as a graph where nodes represent individual musicians and edges represent the event of co-performance. Unlike a standard social network based on »friendship,« these edges are strictly performative, meaning an edge is formed only when two musicians share the bandstand during a session.

Furthermore, these connections can be weighted based on frequency; for instance, a one-time encounter at a session represents a »weak tie,« whereas house band members who play together weekly develop »strong ties« (Granovetter, 1973). This distinction is crucial to the model, as the network's overall resilience

and its information-flow capacity depend heavily on the strategic balance between these two types of connections.

In our structural model, degree centrality serves as the simplest metric, measuring the total number of direct connections a musician possesses. Within the specific context of the New York scene, a musician exhibiting high degree centrality is one who is highly active and integrated across multiple venues.

Although jazz networks are often undirected, we can differentiate between in-degree, viewed as the number of times a musician is invited to play, and out-degree, representing their proactive activity in seeking out sessions. The functional significance of high degree centrality is visibility; it serves as the quantitative signature of the »hustler«—the musician who remains constantly present in the public eye to ensure they are a known quantity in the collective memory of the scene.

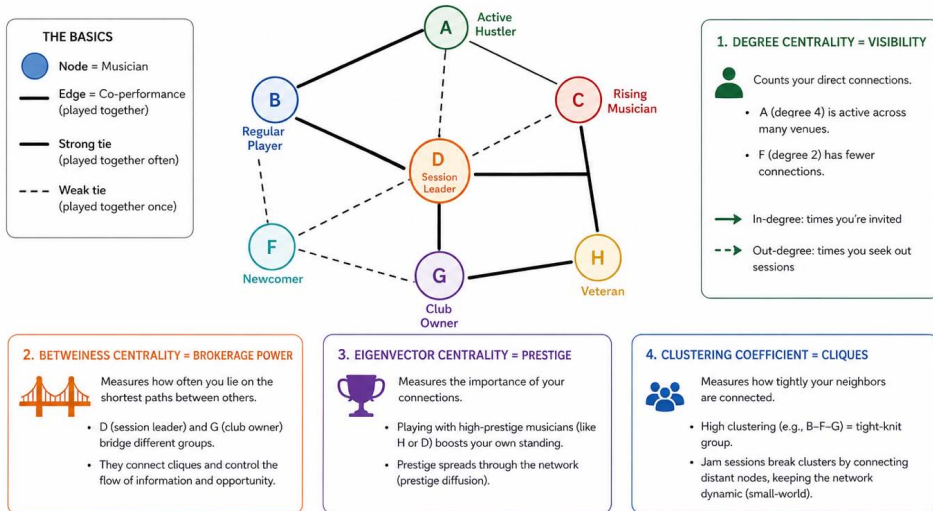


Figure 1. The Jazz Scene as a social network

Betweenness centrality measures the extent to which a node lies on the shortest paths between other nodes, serving as a key metric for brokerage power (Burt, 1992). In the jazz ecosystem, session leaders and club owners often exhibit exceptionally high betweenness because they occupy the »structural holes« between different social cliques, such as the »avant-garde« scene and the »straight-ahead« bebop scene.

This positioning creates a gatekeeper effect; because these individuals bridge otherwise disconnected clusters, they effectively control the flow of information and opportunity. They act as the ultimate arbiters of the stage, deciding who gets access to it and, by extension, which musicians are introduced to specific »sides«

of the network. The session leader functions as the primary regulator of the opportunity structure, wielding the power to connect different musical worlds (Pinheiro, 2012).

While degree centrality counts your direct connections, eigenvector centrality measures the »importance« of those connections, acting as a recursive measure of prestige. Within the jazz hierarchy, playing with an »elite« musician—someone who possesses a high eigenvector score themselves—provides a considerable boost to your own standing. This reflects the reality of the »sideman« economy, where a musician's reputation is often constructed through the prestige of the leaders they have supported on the bandstand.

This process is characterized by prestige diffusion. In a jam session, if a young musician successfully performs alongside a high-prestige veteran, their eigenvector centrality spikes significantly. This mathematical shift mirrors the social reality of »earning your stripes« in the New York scene, where a single high-profile performance alongside a »legend« can be important reconfiguring a musician's entire career trajectory.

Finally, we look at the Clustering Coefficient, which measures the tendency of musicians to form tight-knit groups. High clustering often indicates a »scene« or »clique« where everyone knows everyone else. While these clusters provide social support, they can also become »echo chambers« that stifle innovation. The jam session's primary systemic value lies in its ability to break these clusters, forcing »distant« nodes into contact and ensuring the network remains a dynamic, small-world system (Watts & Strogatz, 1998) characterized by both high local cohesion and short global paths to opportunity.

## 7. Field Dynamics and Capital Distribution

Applying the sociological framework of Pierre Bourdieu (1993), we can conceptualize jam sessions not merely as musical events, but as micro-fields of cultural production. In this performative occasion, musicians are agents occupying specific positions determined by the volume and composition of the capital they possess. The jam session acts as a »market« where these various forms of capital are displayed, traded, and contested.

To visualize the social structure of the jazz scene, we can map musicians onto a two-dimensional space defined by two primary axes of capital. The X-axis, representing cultural capital, accounts for the embodied technical mastery and exhaustive knowledge of the »standard« repertoire required to navigate complex stylistic »dialects« like Hard Bop, Post-Bop, or modern odd-meter jazz; this is essentially what musicians describe as »knowing the music.«

Intersecting this is the Y-axis, which represents social capital or a musician's specific network position. This axis measures the sum of their professional relation-

ships and their practical ability to mobilize these connections to secure labour, such as gigs, recordings, or students. Ultimately, high social capital is the quantitative and qualitative signature of being »in the loop« within the broader jazz ecosystem.

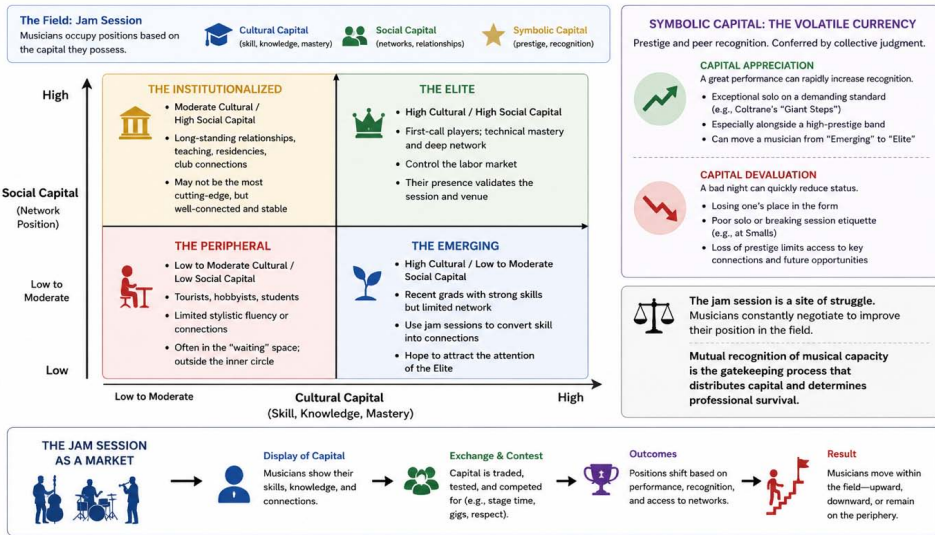


Figure 2. The jam session as a micro-field

By crossing these axes, we can identify four distinct quadrants that categorize the »types« of participants found in the New York jam sessions. At the top right are The Elite (High Cultural / High Social Capital), the »first-call« players who possess both the technical mastery to command respect and the network density to control the labour market; their very presence at a session serves to validate the venue’s prestige.

In contrast, The Emerging (High Cultural / Low-to-Moderate Social Capital) are often recent conservatory graduates who possess technical skill but have not yet fully converted it into a stable professional network. They utilize jam sessions as a primary site for capital conversion, hoping their performance of skill will attract the attention of the Elite.

Meanwhile, The Peripheral group (Low-to-Moderate Cultural / Low Social Capital) includes »tourists,« hobbyists, or students who lack the stylistic fluency or professional connections to move toward the centre; they typically occupy the »waiting« space of the session, contributing to the club’s economy while remaining outside the inner professional circle. Finally, The Institutionalized (Moderate Cultural / High Social Capital) represent musicians who may not be the most artistically »cutting-edge« but have secured stable positions through long-standing relationships, teaching positions, or residency hosting.

While cultural and social capital provide the foundational layers of a musician's career, symbolic capital—manifested as prestige or peer recognition—serves as the dynamic and uniquely volatile currency of the jazz field. Conferred through the collective judgment of peers, this capital can fluctuate dramatically based on the merits of a single performance. For instance, capital appreciation occurs when a musician executes an exceptionally innovative solo on a demanding »standard,« such as John Coltrane's »Giant Steps,« particularly when performing alongside a high-prestige house band; this sudden spike in recognition (Pinheiro, 2013) acts as the primary mechanism that pulls an artist from the »emerging« quadrant of the scene into the »elite« tier.

Conversely, capital devaluation can be swift; a »bad night« characterized by losing one's place in the musical form or failing to adhere to strict session etiquette at high-profile venues like Smalls can result in a significant loss of status. Within this complex regulatory system, such a loss of prestige functions as a social brake, effectively limiting the musician's access to high-value network nodes and future professional opportunities. Ultimately, the jam session functions as a site of struggle where musicians constantly negotiate and attempt to improve their position within the field. The mutual recognition of musical capacity serves as the essential gatekeeping process that determines the distribution of capital and, by extension, the professional survival of the artist in a competitive ecosystem (Pinheiro, 2013).

## 8. The Integrated System Loop

Figure 3 frames the jam session not as a series of isolated musical events but as a self-reinforcing regulatory loop. By integrating cognitive, sociological, and structural dimensions, the model reveals the jam session as a complex adaptive system—one that continuously reproduces and stabilizes the equilibrium of the jazz field through ongoing interaction and evaluation.

At the heart of this loop are three interdependent dimensions that operate in a continuous cycle. The first is improvisational flow, which serves as the generative engine of the system. This refers to the real-time musical interaction taking place on the bandstand, where musicians engage in a non-linear, responsive dialogue. Here, creativity is distributed across the ensemble rather than contained within individuals, producing the raw aesthetic material that will subsequently be judged by the community.

The second dimension is evaluative regulation, which functions as a filter. Every musical gesture is immediately interpreted through a shared framework of stylistic norms, collective memory, and peer expectations. In line with my notion of performance regulation (Pinheiro, 2013), the jam session becomes a space where musicians are constantly assessed. Performances are informally categorized—validated as »hip« or dismissed as »square«—and this evaluative process assigns social and symbolic value to each act of improvisation.

The third dimension is network structure, which operates as the distribution mechanism. Once a performance has been evaluated, its outcome is effectively absorbed into the social network. Positive evaluations enhance a musician’s symbolic capital and increase their centrality—particularly their prestige within the network—while negative evaluations can result in social buffering, limiting access to influential collaborators and high-value performance contexts.

What gives this model its explanatory strength is the presence of feedback loops that make the system both self-correcting and self-reinforcing. The virtue loop describes a cycle in which strong performances lead to increased network centrality and expanded social capital. This, in turn, grants access to more prestigious performance settings—such as moving from small local venues to historically significant clubs like the Village Vanguard—where musicians can engage with higher-level peers. These enriched interactions foster deeper improvisational flow, increasing the likelihood of further positive evaluations and continued upward mobility.

In contrast, the regulatory brake captures the system’s constraining function. Musicians who consistently fail to meet evaluative standards may experience stagnation or marginalization within the network. Limited recognition restricts their access to key developmental resources, such as high-calibre collaborators and prime performance opportunities. As a result, their ability to improve and re-enter higher levels of the field is curtailed, effectively regulating entry into and movement within the professional jazz hierarchy.

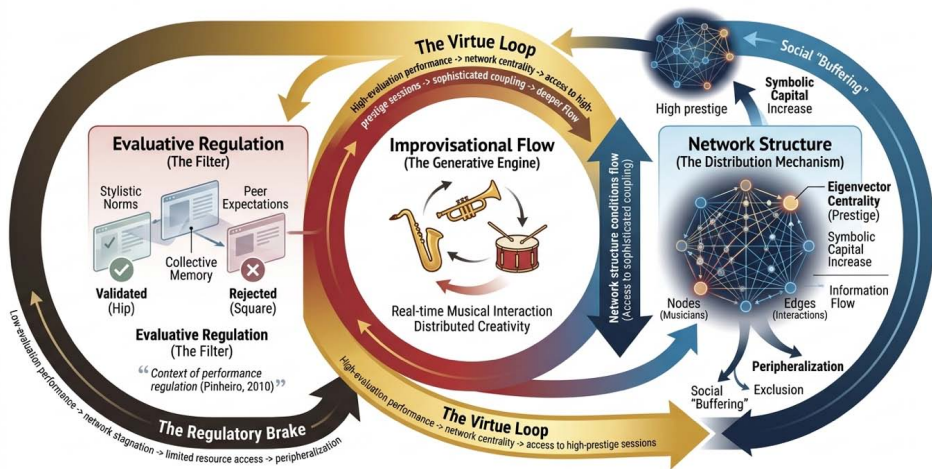


Figure 3. The Jam Session as an Integrated System Loop

When examined through the Integrated System lens, jam sessions can be understood as a unified and dynamic system where creativity, social dynamics, and structural limitations continuously shape one another. Moreover, a detailed analysis of this performative occasion as a complex adaptive system, integrating the cognitive, structural, and sociological components can help illustrate how it can function as a self-reinforcing loop, where musical energy is converted into social and professional capital.

To understand the diagram and its recursive logic, it is helpful to follow the flow of the system step by step, beginning with its generative core and moving through its regulatory and structural layers before returning again through its feedback loops. The process starts with Improvisational Flow, the generative engine of the system. This component draws on cognitive science to model micro-level interaction on the bandstand, where individual musicians—represented as distinct but coupled agents—engage in real-time musical dialogue. In this setting, creativity is distributed across the ensemble: the responsibility for maintaining time, form, and harmonic structure is shared rather than centralized. The result is a collective process in which the »computational load« of performance is distributed among players, generating the raw material of the system—the music itself. As mentioned before (Pinheiro, 2011, 2012, 2013), this interaction is not linear but emergent, arising from continuous, responsive exchange.

From this point, the process moves upward into Evaluative Regulation, which functions as a filtering mechanism. Here, the performance is subjected to an immediate and ongoing assessment shaped by implicit stylistic norms, shared historical knowledge, and peer expectations (Jackson, 2000). Jam sessions become a sociological proving ground in which every musical choice is judged. This evaluative layer acts as a gatekeeper, determining whether a performance is recognized as »hip« or dismissed as »square.« Through this process, symbolic capital—the currency of recognition within the jazz community—is generated and assigned.

The next stage, reached through a process of conversion, is Network Structure, which represents the macro-level organization of the scene through the lens of Social Network Theory. In this framework, musicians are conceptualized as nodes and their shared performances as edges. A musician's position within the network is quantified through measures such as degree centrality and eigenvector centrality, which indicate visibility and prestige.<sup>8</sup> Importantly, connections to already prestigious figures amplify one's own standing, creating a cumulative advantage. As evaluative outcomes from the previous stage are absorbed into the network, social capital—defined by relational ties and reputation<sup>9</sup>—is distributed through flows of information and opportunity.

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<sup>8</sup> See Figure 1.

<sup>9</sup> See Figure 2.

From here, we can conceptualize the economic layer of the system. At this stage, the network becomes an instrument for securing work. High centrality reduces uncertainty and transaction costs for bandleaders and organizers, as dense and well-connected networks provide reliable signals about a musician's competence and compatibility. This layer functions as an informal marketplace, determining access to gigs, recording sessions, and teaching opportunities. It is at this point that reputation is converted into tangible economic assets, sustaining a musician's career through the allocation of paid work.

The system's defining feature, however, lies in its feedback loops, which ensure continuous self-reinforcement. The Virtue Loop, a form of positive feedback, illustrates how strong performances generate recognition that elevates a musician's network position. Increased prestige leads to greater access to high-quality opportunities—better collaborators, superior instruments, and more visible performance contexts—which in turn enable deeper and more effective improvisational flow. The cycle then restarts at a higher level, compounding advantage over time.

In contrast, the Regulatory Brake operates as a negative feedback mechanism. When performances fail to meet evaluative standards, recognition diminishes and network growth stagnates. This marginalization process restricts access to high-value collaborators and opportunities, limiting the conditions necessary for improvement. As a result, the system regulates its own entry thresholds, maintaining boundaries around professional participation.

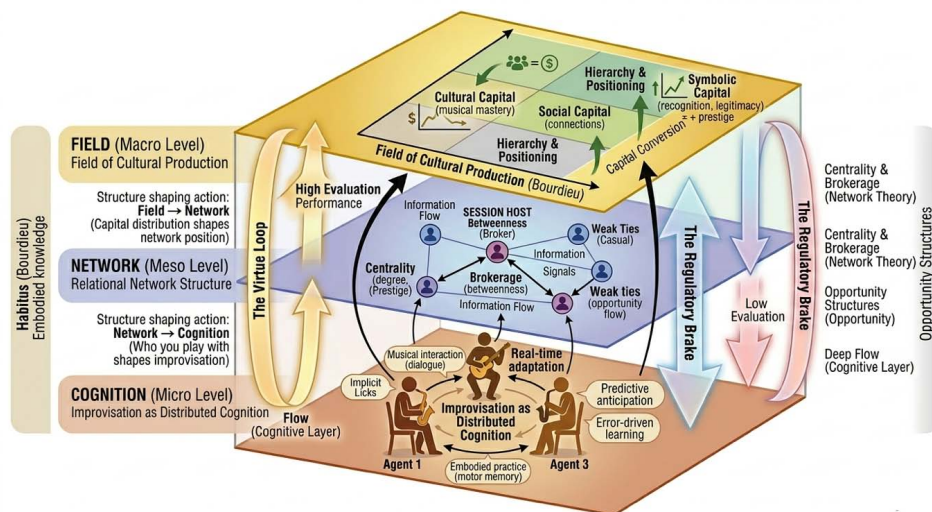
As stated earlier, viewed through this lens, jam sessions emerge not as a simple artistic exchange nor merely a professional networking space, but as a tightly integrated system in which creativity, social evaluation, and structural constraint are inseparably intertwined.

Beyond this cyclical perspective, the framework can be extended through a Multi-Level Conceptual Model, or layered approach, which reinterprets the jam session as a three-dimensional structure organized across hierarchical scales. This approach distinguishes between processes occurring at the micro level (within the musician's cognition), the meso level (between interacting individuals), and the macro level (within the broader cultural field). Its central contribution lies in explaining systemic conditioning: how the historical and cultural dynamics of the jazz field shape the seemingly spontaneous decisions made in performance.

At the heart of this perspective is the tension between upward emergence—where musical structures arise from interaction—and downward conditioning, through which established norms and power structures constrain and guide every note that is played.

## 9. The Multi-Level Conceptual Model

While the System Loop describes the cycle of mobility (process oriented), the Multi-Level Model provides the structure. Figure 4 represents the multi-level conceptual model designed to capture the complex, interdependent dynamics of jazz jam sessions. It moves beyond a simple feedback loop to integrate three fundamental and distinct analytical layers: the sociological Field (Macro Level), the structural Network (Meso Level), and the processual Cognition (Micro Level). By synthesizing these perspectives, the following diagram<sup>10</sup> visualizes the jam session as a complex adaptive system.



**Figure 4. Multi-level conceptual model of the jazz jam session as an integrated system linking field dynamics, network structures, and cognitive processes**

This detailed breakdown of the multi-level model explores the structural architecture, inter-layer dynamics, and theoretical underpinnings of jazz jam sessions. By organizing the scene vertically into three distinct scales of analysis, we can trace how individual musical choices both shape and are shaped by broader social and economic structures.

<sup>10</sup> The model illustrates how macro-level distributions of capital (field) shape meso-level relational configurations (network), which in turn condition micro-level improvisational interaction (cognition). Upward feedback loops indicate how emergent musical performance contributes to reputation formation, network reconfiguration, and the reproduction of hierarchical structures.

The model is organized into three hierarchical analytical layers that move from broad societal structures down to the internal cognitive processes of musical performance.

At the top is the Field (Macro Level), which draws on Pierre Bourdieu's concept of the »Field of Cultural Production« to capture the overarching sociological power dynamics that shape the jazz scene. At this level, the jam session is understood as a sub-field in which musicians possess varying forms of capital that determine their status and influence. These include cultural capital, such as technical mastery and historical knowledge; social capital, represented by professional connections and access to networks; and symbolic capital, which takes the form of prestige and peer recognition.<sup>11</sup> The distribution of these assets structures hierarchy and positioning within the scene, determining who holds authority, visibility, and influence.

The middle layer is the Network (Meso Level), which focuses on the relational structure formed through professional interaction. This level maps the observable configuration of ties between musicians, conceptualizing individual players as nodes and shared performances as edges connecting them. A musician's position within this network can be understood through quantitative measures: degree and eigenvector centrality indicate visibility and prestige, while betweenness centrality captures brokerage power—the capacity to connect otherwise disconnected groups or cliques.<sup>12</sup> This layer also highlights the importance of weak ties, which often function as crucial channels through which information, opportunities, and professional mobility circulate.

At the base of the model lies Cognition (Micro Level), where improvisation is framed as a form of distributed cognition. Rather than being understood as an isolated act of individual creativity, improvisation emerges as a collective cognitive process distributed across interacting agents within the ensemble. It depends on embodied practice, rooted in motor memory and deeply internalized musical habits, as well as real-time adaptation and predictive anticipation. Musicians continuously respond to one another, sharing the computational demands of performance across the group. This distributed process generates a state of interactional flow in which musical meaning and structure emerge collaboratively in the moment.

The model's full explanatory power emerges through its vertical arrows, which map the causal relationships and feedback loops linking the three analytical layers.

The downward arrows represent how structure shapes individual action. The movement from the Field to the Network shows that existing distributions of

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<sup>11</sup> Also see Figure 2.

<sup>12</sup> Also see Figure 1.

capital determine who is able to occupy high-prestige positions within the relational structure. In turn, the transition from Network to Cognition demonstrates how a musician's position—specifically, who they are connected to and able to perform with—directly conditions the nature of their musical interactions. The particular combination of players on the bandstand, constrained by network position, fundamentally shapes the parameters, responsiveness, and overall quality of the improvisational dialogue.

Conversely, the upward arrows illustrate how micro-level interactions generate and transform larger structures. The movement from Cognition to Network captures how successful moments of musical coupling—tight, responsive, and compelling performances—lead to the formation of new professional relationships, effectively creating new connections within the network. Over time, the progression from Network to Field explains how these accumulated interactions translate into broader recognition: increasing centrality within the network becomes the primary mechanism through which a musician converts interactional success into symbolic capital, ultimately securing legitimacy and status within the field.

Completing the system is a feedback loop that connects Cognition directly back to the Field. This curved linkage highlights the jam session as a kind of public trial, where an exceptional performance can produce immediate recognition. In such moments, the usual gradual pathways of advancement are bypassed, and a single, standout display of musicianship can dynamically reshape both the field's hierarchy and the performer's prestige in real time.

To ground the model theoretically, several academic perspectives are incorporated through side annotations that connect its layers to established lines of research.

One key perspective is that of *habitus* and embodied knowledge, drawing on the work of Pierre Bourdieu as well as contemporary cognitive science. This view emphasizes that jazz knowledge is not only socially structured within the field but also deeply internalized and physically enacted. What a musician knows is inseparable from how they play: technique, style, and instinct are sedimented through experience and expressed through the body on the bandstand.

A second perspective comes from network theory and opportunity structures, which links quantitative measures such as centrality and brokerage to insights from labour economics. Within this framework, a musician's position in the network is not merely descriptive but has material consequences, shaping access to work, career stability, and professional advancement. Social structure, in this sense, becomes a mechanism through which opportunities are distributed and sustained.

Finally, the model incorporates distributed and enactive cognition, drawing on thinkers such as Edwin Hutchins and Alva Noë. This perspective reinforces

the idea of the bandstand as a site of collective intelligence, where cognition is not confined to individual minds but emerges through interaction among musicians and their instruments. In this view, musical »thinking« unfolds in the dynamic exchanges between players, rather than residing solely within the brain of any single performer.

### 10. The Integrated System Loop vs. the Multi-Level Conceptual Model

While both the Integrated System Loop (Figure 3) and the Multi-Level Conceptual Model (Figure 4) describe the same phenomenon—the jazz jam session—they approach it through different analytical lenses. The former emphasizes a temporal, process-oriented view of a musician’s career, while the latter focuses on the structural architecture of the social system.

The Integrated System Loop can be understood as a dynamic cycle. It treats the jam session as a sequence of events unfolding over time, effectively mapping the life cycle of a performance and its consequences for the individual musician. At its core, it traces a causal chain: a musician performs (cognition), is informally assessed by peers (evaluation), experiences a shift in social standing (network), and consequently gains or loses access to future opportunities. Its narrative goal is to explain social mobility and professional development, particularly how a newcomer progresses from the margins of the scene to its inner circle. The model also highlights the system’s internal regulation through mechanisms like the Virtue Loop and the Regulatory Brake, showing how the jazz world reinforces norms by rewarding conformity and penalizing missteps, whether stylistic or social.

In contrast, the Multi-Level Conceptual Model offers a layered, structural perspective. It treats the jam session as a complex entity composed of multiple, interacting levels of reality. Its focus lies in connecting different scales: the internal processes of the musician (micro), the interactions between individuals (meso), and the broader cultural and historical context (macro). Rather than tracking a sequence of events, it seeks to explain how these levels influence one another. Its central question concerns systemic conditioning—how large-scale cultural forces and power dynamics shape the seemingly spontaneous, moment-to-moment decisions a musician makes while playing. Within this framework, the system operates through the interplay of downward conditioning, where the broader field constrains individual action, and upward emergence, where individual interactions collectively generate new social patterns and structures.

## 11. Discussion

The preceding analysis of the jam session through the dual lenses of the Integrated System Loop and the Multi-Level Conceptual Model reveals a phenomenon that is far more than a mere musical gathering. Instead, the jam session emerges as a sophisticated regulatory institution—a complex adaptive system that ensures the cultural, social, and economic reproduction of the jazz world. This discussion synthesizes these findings to explore the implications of jazz as a self-regulating field of cultural production.

One of the most striking findings of this study is the presence of systemic conditioning, or »downward conditioning.« The multi-level model illustrates that musical choices made by a soloist in the heat of a performance are, in fact, heavily conditioned by the Field of Cultural Production.

When a musician engages in distributed cognition on the bandstand, they are not creating in a vacuum;<sup>13</sup> they are navigating a cognitive environment where the »rules of the game« are pushed down from the top layer of the field. The historical weight of the jazz canon (Cultural Capital) dictates the aesthetic, harmonic and rhythmic parameters of the dialogue. Thus, the individual's *habitus*—their embodied history and technical mastery—serves as the interface between macro-level social expectations and micro-level motor memory.

The Integrated System Loop highlights the jam session as a temporal sequence of performative policing. This study moves beyond the »art vs. business« binary by demonstrating that aesthetic evaluation is a direct precursor to economic opportunity.

The Virtue Loop represents a meritocratic ideal within the jazz scene: a high-evaluation performance (Micro) leads to an increase in Eigenvector Centrality (Meso), which ultimately grants the musician Symbolic Capital and prestige (Macro). This prestige then trickles back down, granting the musician access to elite cognitive environments—performances with highly proficient musicians where the level of musical »flow« is significantly higher.

However, the Regulatory Brake serves as a vital gatekeeping mechanism. By peripheralizing musicians who fail to meet stylistic norms, the system prevents the dilution of the field's standards. This social »buffering« acts as a negative feedback loop, ensuring that the scene remains competitive and that prestige remains a scarce, and therefore valuable, resource.

A central question addressed by this integrated framework is: *How does a newcomer move from the periphery of the scene to the elite centre?* The answer lies in Capital Conversion.

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<sup>13</sup> See BERLINER (1994) and PINHEIRO (2020).

Our analysis shows that the jam session is a site where Cultural Capital (skill) is publicly converted into Social Capital (network ties) and Symbolic Capital (reputation). This conversion is mediated by the Network Structure. High-betweenness brokers, such as session hosts, act as the primary »valves« in this system. By allowing a newcomer to »sit in« with an elite node, they facilitate a prestige jump that is mathematically observable through network metrics.

By conceptualizing the jam session as a three-dimensional, layered model, the apparent divide between individual agency and social determinism begins to dissolve. Music clearly emerges from the bottom up, through real-time interaction, coupling between musicians, and the unfolding of improvisational flow. At the same time, however, this creative process is shaped and constrained from the top down by broader social structures. What appears spontaneous is, in reality, continuously conditioned by the system in which it occurs.

At the micro level, cognition operates as a high-speed, enactive process grounded in shared memory and embodied knowledge, where musicians engage in rapid, responsive dialogue. At the meso level, this interaction is structured by the network, whose configurations—defined by brokerage positions and flows of information—shape who plays with whom and under what conditions. At the macro level, the field establishes the overarching distribution of power, hierarchy, and legitimacy, determining the value of actions and the boundaries of acceptable practice.

Seen in this way, the jam session functions as a self-correcting system. It is not merely a site of artistic expression but a dynamic mechanism in which creativity, social interaction, and structural constraint are inseparably intertwined. The Integrated System Model suggests that the jazz world operates without the need for centralized institutional control because the jam session itself is crucial as a necessary regulatory infrastructure. Through the continuous interplay of reinforcing and constraining forces—captured in the Virtue Loop and the Regulatory Brake—the system maintains its equilibrium, balancing innovation with tradition in every chorus performed in iconic venues and across the wider global jazz scene.

The synthesis of ethnographic data and systemic theory reveals that the jam session is not a peripheral social gathering, but a foundational regulatory apparatus. By conceptualizing the session as an integrated system, we can observe how it manages the inherent tensions of the jazz art world across three primary dimensions: the creative, the social, and the economic.

At the musical level, the jam session functions as a site of constrained creativity in which a persistent tension is maintained between the standard repertoire and the improvised solo. The standard repertoire represents the collective memory of the tradition, expressed through a shared set of pieces and canonical forms, while the improvised solo embodies the drive toward individual expression and innovation (Pinheiro, 2020).

Within this structure, the regulatory function of the repertoire operates as a kind of linguistic constraint. By requiring musicians to work within shared harmonic progressions and formal structures, the jam session ensures that any innovation remains intelligible to the collective. In other words, novelty is only meaningful insofar as it can be recognized against an established framework of musical meaning.

This also produces a form of aesthetic discipline that defines the boundaries of what is musically permissible. Innovation that disregards the underlying rules of rhythm, harmony, or form is not interpreted as creative advancement but instead as a breakdown in system coherence. As a result, the jam session enforces a selective logic: it allows for continuous experimentation, but only within limits that preserve the recognizability of the tradition. In this way, jazz maintains its identity as an improvisational art form while avoiding a collapse into incoherence or aesthetic entropy.

Sociologically, the jam session operates as a paradoxical space: it is formally a public event, yet in practice it remains exclusionary. It must constantly negotiate a balance between openness to new participants and the need to preserve high professional standards through informal gatekeeping mechanisms. This tension can be understood as a dynamic between democratic and aristocratic logics. In principle, any musician can sign up and place their name on the list, suggesting an open-access system. In practice, however, the actual distribution of stage time is mediated by the session leader's assessment of each musician's accumulated forms of capital—cultural, social, and symbolic—which ultimately can determine their legitimacy within the setting.

Within this structure, jam sessions function as a key mechanism of social regulation. This ritualized form of informal competition operates as a high-frequency filtering process, continually sorting participants according to their level of embeddedness in the field. It prevents the dilution of what might be called the »jazz brand« by ensuring that only musicians who have internalized the field's habitus are able to occupy central positions within the performance network. This context of performance regulation is precisely what allows the jazz ecosystem to remain self-correcting and internally coherent without requiring centralized institutional oversight.

Finally, the jam session can be understood as an informal labour exchange embedded within an industry characterized by precarious employment and the absence of formal hiring structures. In this context, the session functions as a site where the »data« necessary for economic transactions is continuously produced and circulated (Pinheiro, 2013). A key mechanism within this system is the conversion of symbolic into economic capital. In scenes such as New York's jazz ecosystem, reputation operates as a highly liquid form of symbolic capital. A strong performance in a high-prestige session can therefore be directly translated

into what might be described as »gig currency,« including referrals, substitute performance opportunities, and invitations to join established ensembles.

At the same time, jam sessions play a crucial role in risk mitigation for bandleaders. By observing musicians in a live, unstructured environment, decision-makers are able to evaluate not only technical proficiency but also social reliability, adaptability, and interactional intelligence. In this sense, the session reduces transaction costs associated with hiring by providing a publicly observable record of a musician's value within the field, allowing economic decisions to be grounded in continuous, collective assessment rather than formal credentialing.

Ultimately, the jam session is the mechanism through which the jazz world maintains and, at the same time, reconfigures its identity in the 21st century. It ensures that while the music is aesthetically »free,« the culture remains disciplined and self-correcting. By linking the micro-level cognitive »flow« of the improvised solo to the macro-level structure of the professional network, the jam session provides a stable infrastructure for an art form that is constantly in flux. It is the »engine room« of the jazz field, where the future of the music is negotiated, one chorus at a time.

## 12. Conclusion: The Jam Session as a Synthesized Institutional Engine

The analysis presented in this study challenges the prevailing romanticized view of the jazz jam session as a mere site of spontaneous, unmediated expression. By synthesizing ethnographic evidence from the New York jazz scene with frameworks from sociology, network theory, and cognitive science, we conclude that jam sessions are not informal byproducts of jazz culture, but rather an important component of its regulatory system.

The primary contribution of this work is the integration of the Integrated System Loop (the »Cycle« Model) and the Multi-Level Conceptual Model (the »Layered« Model). This synthesis allows us to understand both the mechanics of professional movement and the architecture of cultural power simultaneously.

The Multi-Level Model provides the vertical »scaffolding« of our theory. It demonstrates that while musical performance emerges from the bottom up—through the real-time coupling of agents—it is simultaneously regulated from the top down by the historical and hierarchical weight of the Field. This »Downward Conditioning« ensures that even the most innovative improvisations remain legible to the tradition.

Nested within this layered architecture is the Integrated System Loop. This loop represents the horizontal »engine« that drives individuals through the layers. It illustrates how micro-level Cognition on the bandstand is transformed into meso-level Network status, which eventually solidifies into macro-level Symbolic Capital.

Jam sessions provide the essential infrastructure that allows three seemingly disparate domains to coexist. It supports artistic practice by serving as a laboratory for distributed and embodied cognition, where musical intelligence emerges as a property of the collective ensemble. At the same time, it reflects social stratification by acting as a field in which cultural and symbolic capital are contested, redistributed, and ultimately validated by the community. Finally, it facilitates professional mobility by functioning as a high-density network hub that converts reputational »signals« into tangible labour market opportunities.

By moving beyond the »myth of spontaneity,« we reveal a complex adaptive system governed by rigorous implicit norms and self-correcting feedback loops. The system balances the radical freedom of improvisation with the conservative necessity of stylistic preservation. It is through the »regulatory filters« of the bandstand—the evaluation, the gatekeeping, and the hierarchical recognition—that jazz maintains its integrity as a distinct cultural field while simultaneously allowing for creative emergence.

### 13. Implications for Future Research

The integrated framework proposed in this study—synthesizing field theory, network science, and distributed cognition—offers a robust template for examining improvisational cultures far beyond the confines of the jazz bandstand. By deconstructing the jam session as an Integrated Regulatory System, we provide a modular analytical toolkit that can be applied to any creative community where real-time performance and social reputation are inextricably linked.

While this study has focused primarily on the New York jazz scene, the underlying mechanics of the Virtue Loop and the Regulatory Brake likely extend to a wide range of other creative and knowledge-based ecosystems. Future research could apply this framework to several domains in order to examine how similar dynamics of evaluation, networking, and capital conversion operate in different contexts.

One promising area is digital arts and open-source communities. In environments such as collaborative coding platforms like GitHub or digital live-coding performances, the »performance« itself takes the form of code. Within this setting, researchers could trace how individual technical contributions at the cognitive level are continuously evaluated through peer review processes, and how these assessments shape a contributor's influence and brokerage position within the broader networked ecosystem.

A second relevant domain is freestyle rap and slam poetry, both of which closely resemble the competitive dynamics of the jazz cutting contest. These cultures are structured around real-time verbal improvisation, where performers

compete in high-intensity exchanges. Applying the multi-level model here would make visible how linguistic improvisation is shaped by local field conditions, particularly norms of authenticity and stylistic legitimacy, and how symbolic capital is gained or lost through these publicly adjudicated performances.

A third extension lies in collaborative scientific research, particularly in large-scale »Big Science« environments. In such contexts, scientific discovery often depends on improvised problem-solving within research teams. Here, the framework could be used to analyse how collective cognitive flow within laboratories is regulated by external evaluative systems such as peer review, and how a researcher's position within citation and collaboration networks translates into institutional forms of capital, including tenure opportunities and research funding.

Further research is needed to refine the quantitative metrics associated with the Multi-Level Conceptual Model. While this study utilized Social Network Analysis as a meso-level bridge, future scholars might employ Real-Time Interactional Analysis or Biometric Synchronization Data to more precisely measure the bottom-up »emergence« of cognitive coupling during improvisation.

Additionally, the Downward Conditioning previously identified warrants further longitudinal study. By tracking a cohort of musicians over several years, researchers could quantify the exact rate at which Cultural Capital (skill) is converted into Symbolic Capital (prestige) and identify the specific »network valves« (gatekeepers) that accelerate or inhibit this process.

Finally, the model offers a basis for cross-cultural comparison. By applying the Integrated Regulatory System to improvisational traditions in non-Western contexts—such as Indian Classical *Raga* or West African *Griot* traditions—scholars can determine which aspects of the jam session are common properties of complex adaptive systems and which are unique products of the Western jazz *habitus*. Such studies would move ethnomusicology toward a more unified, systemic understanding of human creativity as a regulated, collective phenomenon.

#### 14. Coda

In summary, the jam session must be recognized not as a peripheral social gathering, but as the sophisticated institutional engine that reproduces and transforms the jazz world. It represents the vital intersection where the aesthetic, the social, and the structural converge to maintain the equilibrium of a global art form.

The jam session serves as the site where the *habitus* of the musician—that deeply internalized set of dispositions, technical skills, and historical sensibilities—is put to the ultimate public test. It is here that the »strength of weak ties« (Granovetter, 1973) is forged into professional reality; the casual interaction on the bandstand today becomes the recording contract or international tour of

tomorrow. By providing a transparent arena for collective musical dialogue (Pinheiro, 2012), the jam session acts as the ultimate arbiter of professional legitimacy, filtering talent through a gauntlet of peer evaluation that no formal institution can replicate.

To understand jam sessions is to understand the perpetuation of jazz in the 21st century. In an era of increasing institutionalization and academic formalization of the music, the jam session remains a »wild« space—a self-correcting ecosystem that resists total codification while demanding absolute discipline. It proves that a culture can remain vibrant and innovative precisely because it is so effectively self-regulated.

The Integrated Regulatory System model confirms that the »freedom« of jazz is not an absence of rules, but a mastery of them within a high-stakes social network. Every »chorus« played in the jazz clubs of Manhattan and beyond is a micro-negotiation of the field's entire history and its potential future. Ultimately, jam sessions ensure that the jazz tradition is not a static museum piece, but a living, breathing, and rigorously defended social practice. It is the engine room of the music, ensuring that jazz continues to transform, with the same interactional intensity that has defined it for over a century—one chorus at a time.

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*Sažetak*

**Područja, mreže i protok: složeni prilagodljivi sustav  
jam sessiona u jazzu**

Jam sessioni u jazzu povijesno su idealizirani kao neformalne izvedbene prigode za spontano, neposredovano izražavanje. Međutim, ova studija se oslanja na etnografske dokaze s njujorške jazz scene kako bi pokazala da ta okupljanja funkcioniraju kao visoko strukturirani, integrirani regulatorni sustavi koji su ključni za kulturne, društvene i ekonomske sfere svijeta jazz. Sintezom teorije polja Pierrea Bourdieua, analize društvenih mreža i modela distributivne spoznaje, ovaj članak konceptualizira jam session kao složeni adaptivni sustav.

Analiza identificira trojnu povratnu petlju u kojoj se glazbene interakcije na mikro razini (distributivna spoznaja) povećavaju i formiraju relacijske strukture na srednjoj razini (društvene mreže), koje su potom regulirane hijerarhijama na makro razini i stilskim normama (polje). Kroz mehanizme poput »petlje vrline« i »regulatorne kočnice«, jam sessioni funkcioniraju kao visokofrekventni filteri koji upravljaju preustrojem kapitala i čuvaju profesionalnu mobilnost. Ovo istraživanje u konačnici pozicionira jam session ne kao neformalni nusprodukt scene, već kao središnji institucionalni pogon koji osigurava opstanak i transformaciju kulture jazz u 21. stoljeću.