

**SYNTHESIZERS
AND OTHER
HYBRID ELECTRONICA
WITHIN THE
SOCIALY EMBEDDED CONTEXT
OF TECHNO MUSIC**

by

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ABSTRACT

The role of the instrument in the cultural production of techno music is explored by disputing the notion that mechanistic complexity must be rejected in order to maximize social cohesion and human creativity. The unification of historically alienated communities, discourse to demystify subsequent technological innovation, the rise of media and related critical expertise are some of the influences identified that gave relevance to the computer-synthesizer hybrid, electronica. The author uses classical theoretical frameworks offered by Hegel, Marx, and Weber coupled with contemporary cultural approaches espoused by Bourdieu and Giddens to provide support for electronica's cohesive potential. The analysis examines the hybridization of technology in the production of techno music as cultural artifact, establishes the importance of technology and mechanistic complexity in producing techno music, examines the collaborations that have unified artistic, scientific, and technological communities in developing and refining electronica; and explores the extent to which these technological arrangements have optimized human creativity.

KEY WORDS: techno music, cultural mediation, hybridization, electronica

INTRODUCTION

Many social scientists have explored the production of music as cultural artifact, but few have focused specifically on the relationships found within the social context of music that leads to the creation of the musical instrument. Popular dance music, as socially constructed cultural product, can be useful to examine social bonds among typically marginalized members of society. There is no better method by which to examine social bonds among fringe groups than within the contemporary musical genre known as *techno*. This emerging genre of dance music is produced by an unprecedented level of complex technologies involving computerized, electronic, hybrid machines that serve in the place of traditional musical instruments. Though collectively known as 'techno', the genre is actually composed of subcategorical typologies of music distinguished by production and consumption patterns, known as house, hiphop, jungle, progressive, breakbeat, abstract, trance, ambient, and experimental.¹ Techno, as well as her typologies, are largely arranged around compositional uses of the *instrument* creating the music. That instrument is the synthesizer. The traditional synthesizer has been adapted with superior capabilities through its hybridization with computer technology. This hybridization came about as a result of technical collaboration among artists and infomatics engineers. It is precisely this linkage, as well as the socially embedded context which enabled this musical instrument technology to emerge, that will be the focus of this paper.

To illustrate the link between culture, artistic and technical communities (unified through the rise of the synthesizer-computer hybridization), and its offspring musical genre *techno*; use of classical theories at the macrosociological level can make significant contributions to demystifying the link between structural elements and the individuals embedded within techno music's social, technological, artistic, and engineering environments. Classical theories offered by Marx and Weber will be used to provide accounts of the nature of social bonds among individuals, while more contemporary approaches by Bourdieu, Giddens, and Shrum will illustrate the depth and character of these social and cultural musical influences with greater specificity. The analysis to be presented will demonstrate the role of the

synthesizer in expediting these social collaborations, and the instrument's centrality in constructing this unique community.

MARXISM AND CULTURAL PRODUCTION

Marx is most revered for his contributions in demystifying economic relations under conditions of industrialization. His philosophies on social relations are not, however, limited to critiques of industrial participation, and can be used in a broader cultural sense to demystify the relations among individuals engaged in production of cultural artifacts. His essays on fragmentation of human nature and alienation laid an important foundation for analysis pertaining to postmodernism and the deleterious consequences of modernity. Marx argued vehemently against the Hegelian doctrine of the notion of the *dialectic* which had once dominated philosophic literature. Hegel's assertion of the importance of the dialectic was based on Socratic principles and suggested that knowledge was systematically built upon sets of conflicting dialogue which led to the discovery of absolute truth. To illustrate the weakness of the antagonistic foundation of the dialectic, Marx argues that it is only through a natural state of human *unification* that the discovery of knowledge is brought about. Marx criticizes the notion of human fragmentation and related social processes of opposition, which he considers unnatural and inconsistent with human nature. He instead argues that humans are organically social and desire unification among one another. When such a collective state of harmonious equilibrium was achieved, human emancipation would arise.

Marx was also concerned with the *processes* of cultural production. He claimed that individuals engaged in the production of cultural artifacts temporarily displace or remove from themselves their own human essence, in order to be capable of extracting the necessary autonomic functions required by repetitive, dehumanized, industrialized labor. Once the industrial revolution entirely removed man's responsibility of the direct manipulation of raw materials, and machines enabled further depersonalization of the process of production, individuals would be irretrievably alienated from their own labor and hence

¹ Typology derived from Ray Gun Magazine, July 1999.

alienated from their own unique essence. Deleterious influences from industrialization do not end here, for Marx extends the argument further by suggesting that the process of cultural production also alienates us from one another, and further attenuates social bonds that would otherwise, under natural conditions, flourish. As depersonalized and mechanized individuals, we become unfulfilled in our human potential, our unique distinguishing characters become eroded, and the resulting state of unnatural fragmentation resulting from mechanization begins to permeate and disintegrate the very fabric of society.

Is this fragmented, alienated state and its related attenuation of social bonds indicative of a decline in our cultural progress and an inevitable sign of man's catastrophic destiny? Marx extends Hobbesian notions of humanity's relationship with nature, and suggests that a return to organic harmony away from mechanistic pursuits will return us to a collective state of equilibrium. The phenomenon of increasing mechanistic alienation and fragmentation, Marx suggests, is becoming universal, because all humans must produce activity in order to survive. Our sustenance, however, increasingly requires us to be detached from our own creative nature, requires us to be removed collectively from our universal environment, and requires that we withdraw away from one another due to our individualization embedded within the evolving social structure. Marx fears that increasing detachment from our own natural creativity in the production of cultural artifacts will inevitably lead to the weakening of our relationships to the self, to nature, and to one another. Is a return to human unification and harmony possible without rejecting our increasingly mechanistic industrial society? Is the rejection of machines and related mechanistic technical accouterments of industrial complexity truly necessary to enable humanity to optimize creativity and assure us of our cultural potential?

While I agree with the fundamental principles of Marx's social, cultural, and philosophic critique, I argue that the rejection of postmodern mechanistic technological complexity is not a necessary precursor to the process of cultural production and hence optimization of human creativity. To the contrary, I will argue of the *utility* and *necessity* of mechanistic technological complexity in *expediting* human cultural productivity, creativity, and harmonization. In the current analysis, I intend to examine the hybridization of technology in the production of techno music as cultural artifact, establish the importance of

technology and mechanistic complexity in producing techno music, examine the collaborations that have unified artistic, scientific, and technological communities that were previously fragmented but have together fostered the synthesizer-computer hybridization necessary for techno production; and finally, explore the extent to which these socially embedded arrangements have optimized human creativity.

SOCIAL RAMIFICATIONS OF COMPUTER TECHNOLOGY

Critics of computer technology have cited many deleterious consequences of the increased reliance and proliferation of infomatic technologies and related complexities. Among the many criticisms surrounding productivity discussed by detractors of computer or information technology [IT], computers have been associated with decreases in low-skilled occupational opportunities (Singelmann and Deseran 1993), increases in global competition for high-skilled vacancies (Hart 1988), reductions in wages (Cockburn 1991), increases in the prevalence of dangerous occupational work environments (Zimmerman 1986), exploitation of the reserve army of labor in informal secondary labor markets (Saint-Paul 1996), reductions in manufacturing quality, increases in planned obsolescence, elimination of agrarian societies (Shiva 1987), increases in migration to overcrowded urban areas (Kasarda 1993), and fostered dependency upon hegemonic forces of Western industrialists at all levels of economic development (Wajcman 1991).

Contemporary technologies contribute indirectly to diverse social ills, and in particular subtle ways to significantly hinder participatory democratic decision making. Yet if technologies' social and political potency is not taken into account, the best we can hope for is improvements in productivity or in addressing basic social needs that are nonetheless associated with further unintended declines in political engagement, attenuation of community bonds, experiential divorce from nature, individual purposelessness, and expanding disparities in wealth.²

Runaway shops, multinational hiring of non-unionized workers in less developed nations, reduced corporate tax liabilities as incentives to economic development, related reductions in tax accumulation, and the inevitable consequences for social transfer strategies [economic redistribution through welfare systems] have also created greater polarity among workers throughout the world. These conditions,

rooted in technological transformations of the workplace, have fueled racial, gender, and ethnic antagonisms among workers (Roos 1985), produced a fractured labor force (Pagels 1988), eliminated pride in goods or services produced, and appear to be fulfilling Marxian prognoses regarding alienation.

Conversely, supporters of computer technology have suggested that technological changes advanced by the computer technology revolution will be an important mechanism for the fulfillment of human potential. Information technology is expected to facilitate equality and bring about equilibrium to the existing social, economic, and cultural order among both industrial and underdeveloped societies. It has also been suggested that IT may eventually render other mechanism of human expression obsolete.

One of the most important mechanisms of human expression lies in the cultural production of music. Music as cultural artifact has been significantly influenced by computer technology under conditions of postmodernism. Because production of music is an important area of cultural expression, and to explore the impact of computer technology in the production of contemporary dance music in greater detail, it may be useful to identify the community involved in the production of techno music. To that end, Weber's concept of *elective affinities* can be particularly insightful.

ELECTED AFFINITIES AND SOCIAL ACTION

In Weber's notion of *elective affinities*, he argues that some elements in society go together more naturally than others. Though his work focused on religion as cultural artifact, the current treatment will incorporate the useful concept of elected affinities to demystify techno music production. Before the emergence of hybrid synthesizers and computer technology, artistic and technology communities were bifurcated and had little integration. With the rise of synthesizers and other electronica, the two juxtaposed communities have become unified. The new worlds integrating arts with science and technology have since become unusually harmonious and tightly calibrated. What circumstances have enabled these harmonious postmodern collaborations to be brought about ?

² Sclove in Brooke and Boal, p. 87

Weber views social action as essentially a *rational pursuit of self-interest*. He argues that both culture and social action are interrelated and mutually influential in determining the quality of human participation, as well as the nature of social bonds embedded within systems of cultural production. Musical *innovation* can be assessed within the context of social action. The innovation that brought about the synthesizer and other electronica required the unification, cooperation, and integration of artistic and technical communities in creating these hybrid instruments. This phenomena clearly required rational self-interest to bridge the wide cultural gap between the two bifurcated worlds of art and technology. Self-interested artistic and technical communities saw the opportunities inherent in integrating these previously polarized processes of technical and musical innovation, and together engaged in unprecedented levels of artistic and technology transfer to produce the hybrid electronica instruments that are necessary to create the music found in the genre of techno.

Creative thinking in music is believed to display similarities with creative thinking in science. Consequently, attempts have been undertaken to explore creativity from a rational point of view. Ultimately, this led to [the uses of] formalized methods and automated processes. The [subsequent collaborations] based the essence of musical creation on technology that transformed abstract sounds into real material objects. The...creative molding of sound requires the knowledge of particular nonmusical skills in acoustics, psychoacoustics, electronics, and computing in order to record on magnetic tapes, to use technologies of cut and paste, stretching, compressing, and filtering, and to make many other sound manipulations. The technological environment implies that creativity can be controlled or guided by rational thought.³

The integration of these previously fragmented communities extends Weber's assertion that *both* culture and social action determine how human activity is arranged, and provides support for his notion of elective affinities. These two unique communities, and the elective affinities that they represent, were socially bonded through the evolution of hybrid technological instruments. These newly constructed social ties, and the apparently harmonious equilibrium that emerged as a result of the unification of these fractured communities, led to a period of acute creativity and innovation that resulted in the global proliferation of techno music, as well as the development of a billion dollar industry surrounding the synthesizer. With ostensibly diverse interests, what was the intervening variable that induced these distinct communities to a state of solidified cooperation? I argue that it is the *discourse* that evolved

³ Marc Leman, in Runco p. 285

from this polarization, that was largely responsible for its integration. Let us now examine the discursive elements that solidify and harmonize the otherwise fragmented artistic and technological communities comprising the techno industry.

PRIMACY OF DISCOURSE

Bourdieu examines artistic taste, judgments, and preferences using social, cultural, and economic indices for artistic consumption. In his investigation of artistic taste and cultural consumption, Bourdieu argues of the importance of *origins* of taste, which he claims is developed through family exposure to artistic cultural products and formal education. According to Bourdieu, cultural exposure in the home, coupled with proper formal education, will inculcate the necessary appreciation for the accouterments and discourse of cultural consumption. In order to accept the assumptions of Bourdieu's analysis, one needs mostly to be concerned with the consumers who, in his view, play the most essential role in the creation of artistic culture.

Art is produced exclusively for consumers who, in turn, engage in the process of deciphering art in order to display to the world that they have a firm grasp and explicit mastery of the subject matter presented. The *discourse* among these competent consumers is the key element in the analysis. Art is produced for the expressed purpose of fostering discourse among culture consumers whose own expertise is evaluated on the basis of increasing accumulations of *cultural capital* and the necessary articulation of the knowledge they embrace. Art, therefore, only has meaning for those who are able to adroitly decipher it. Bourdieu contends that one can only decipher art suitably if one is cognizant of art within a historical, stylistic, and technical framework. The musician actively seeks the attention of astute audiences capable of accurate interpretations, whose consumption actually guides the definition, the creative process, and produced artifact intended for, music consumers. Bourdieu asserts that music is the purest form of art, and creators of music as well as competent consumers are among those with the highest taste. Here the concept of rarity and innovation in determining consumption patterns is established.

DISCURSIVE ELEMENTS OF TECHNO MUSIC

No where is the importance of discourse more obvious than in the genre of techno music. Discourse among techno consumers is constructing an entirely new vocabulary of language, incorporating onomatopoeiatic bells and whistles with technical engineering and software language. This language includes musical arrangement and compositional techniques, computer processor efficacy evaluations, empirical software assessments, cost-benefit calculations, strategic planning criteria, and even emotional, sensual, critical, psychotropic drug, and other commercial considerations. In contrast to the classical musical discourse Bourdieu examined, *techno musical discourse* is constantly changing and appears to be as inclusive, far-reaching, and interdisciplinary as possible. The inclusion of arts, technology, computer software, and musical composition has harmoniously integrated and given rise to such an unusual hybridization of language, unlike any that has ever been invoked to decipher previous art forms in the history of cultural production. Much like the hybridization of the artistic and technological community producing techno, and the hybridization of the instruments that they created to make techno a musical reality; the discourse among consumers and producers of techno have blended emotive, sensual, and business acumen in a language expressing artistic, technical, and analytic style. This discursive phenomenon is due largely to the need to enhance collaboration potential and decipher the uses, applications, and development of synthesizers and other hybrid electronica. Before proceeding further, it is necessary to define the boundary of social agents engaged in the new artistic discourse in question, in order to elicit the distinct contributions that these communities make toward the complex construction of techno musical discourse.

DIMINISHING DISTINCTION OF CONSUMER AND PRODUCER

The techno *consumer* is no longer limited to the individual at the club or rave,⁴ who consumes and evaluates techno music by publicly deciding to dance or to sit this one out. Due largely to the complexity of techno music production, the consumers involved in this musical genre now include

producers and recording industry executives, promoters and engineers, composers and musicians, even casual internet browsers and platform managers. These diverse constituents involved in techno music both consume as well as produce SOHE [synthesizer and other hybrid electronica] to some degree. The complexity involved in SOHE technology has resulted in the erosion of the line between consumption and production. This erosion is due to swift access to new software, the need to engage in proactive innovation to assure technical compatibility with existing SOHE electronica platforms, and the need to disseminate or transfer new technology before obsolescence occurs and hence demand diminishes. As such, the members of this SOHE electronica hybrid community developed a complex techno musical vocabulary to assist in the development, production, and consumption of new hybrid instruments, compatible software technologies, and the necessary hardware to interface these platforms. Harmonious communication among these technical and artistic communities has resulted in a complex language that is constantly changing and almost impossible for an outsider to decipher. As predicted by Marx, the rise in complexity of language and the need for broad understanding among affected individuals in the age of authority relations has led to the postmodern rise of the *expert*.

CULTURAL MEDIATION

In *Fringe and Fortune* Shrum examines the contemporary influences of critic evaluations and the extent to which they affect cultural consumption patterns. Incorporating the Weberian notion of rational self-interest through contemporary processual elaborations of motivation, prestige, status enhancement, and exchange; Shrum illustrates the utility of *critics* in determining cultural participation. He reasserts the concept of *cultural mediation*, which functions as the necessary discursive intervention between art and its public. He argues that contemporary cultural audiences are so overwhelmed by the competing amount of information available to decipher art adroitly, that consumers are compelled to solicit the knowledge and experience of the expert critic in order to fully appreciate cultural artifacts produced in an atmosphere of postmodern uncertainty. Contemporary culture, Shrum argues, has adapted to a more diverse audience

⁴ The rave is a mobile dance venue where techno music is often played and evaluated. For a full discussion, see Thornton, 1996.

of artistic consumers through wider dissemination of culture through the role of the critic. Consequently, social action and participation in artistic culture (through both consumption and production) is contingent upon adequate access to mediating expertise. The rise of mediating experts has enabled discourse to be more inclusive than ever before, and enabled artistic discourse to be more broadly disseminated than in any time in our human artistic development. Consumption of artistic cultural production, in Shrum's view, is now highly accessible through mediating expert influences. Consumption patterns have taken on a function of discursive practice, and fluency in relevant language therefore, mediates the relationship between artwork and the public.

Who then is this knowledgeable, omnipresent, mediating critic ? The author suggests that the critic's primary responsibility was 'to know and to make known.' This already implies a *filtering* mechanism in communication, inherent by nature of the vocation. The critic's mediation is expected to impart wisdom to an unknowing public, to apply strict criteria from a knowledgeable standpoint, and to do so with consistent standards. A critic is primarily responsible for public education, discourse facilitation, and assessment of quality of cultural artifacts produced. The critic's expertise will be most readily determined by thorough and direct experience, coupled with proficiency of specialized knowledge.

THE COMPONENTS OF CULTURAL MEDIATION

At this point, it is necessary to illustrate Shrum's theory of cultural mediation in greater detail. The more valuable a work is within the cultural hierarchy, the more valuable the critic's discourse is to its status. Four processes are outlined that are necessary in understanding what is imparted from the critic to the audience through cultural mediation, which can be applied to the phenomena of techno consumption. Shrum's processes of cultural mediation involve differentiation, perception, evaluation, and rewards. *Differentiation* enables the consumer to distinguish cultural objects from each other, *perception* enables the object to be interpreted within constructs of the consumer's experiences, *evaluation* attributes a value to the work in relation to others, and finally *rewards* are discussed which manifest through status

enhancement. Among art producers, knowledge of cultural artifacts within an artistic and technical framework, provides prestige to the extent one is capable of participating in legitimating discourse. Preferences and judgments on quality and effect are created in the *context of discourse*. When experts mediate culture through a display of preferences based on technical and artistic criteria, the individual communicates information about the self and implies affiliation with relevant social networks. The art critic therefore, in Shrum's view, is the guardian of cultural and technical principles who can dictate behavior, facilitate conformity, motivate consumption, and even employ censorship. It would be prudent to expand the author's theory, and explore the process of cultural mediation in the case of techno music. To that end, it will be useful to employ Giddens' concept of *postmodern trust*.

TRUST IN THE MASTERS OF MEDIATION

Giddens investigates the concept of the self under conditions of modernity. He argues that there are particular features of the post modern world that are of greater consequence to the construction of the self, particularly the rise of organizational primacy and the increased reliance upon standardized segmentation of time and space. The former, less abstract influence of institutions is especially prevalent through the mass media, where the mediation and filtering of information occurs. Giddens suggests that the communication of pure, unfiltered information without primary interpretation is virtually impossible in our postmodern world. According to the author, '... the media does not mirror reality but *forms* it.' Aside from the powerful institution of the media, modernity has given rise to the institutional leadership representative, *the expert*, who is further responsible for interpretation and elaboration of information in our increasingly complex social world. These as well as other postmodern forces facilitate the demise of marginality, bringing events which were once thought to be distant and removed from our consciousness to a position of centrality within a more intimate level of intrusion. Modernity, according to Giddens, increases pressure to process distant information, which in turn requires the involvement of another agent to mediate our information for us. This reliance upon, and elevation of, the expert serves to relegate the populous to lower status, alienate the masses, redefine boundaries of knowledge, and creates an

environment of broad dependency and loyalty upon these masters. To the contrary, I argue that the reliance on experts serves as a force of cohesion and cooperation, and creates harmonious self-interested opportunities for those involved in the artistic and technological hybridization found in techno music. Whatever its effect on social bonds, Giddens argues that this phenomenon is only possible through the unusual process of *postmodern trust*. In the case of techno culture, the current analysis will demonstrate that trust and related mediation, available through media surrounding techno, expedites harmonious equilibrium under postmodern conditions of overwhelming uncertainty. In a rational, self-interested effort to avoid complexity and related chaos, the critical expertise found in techno media therefore, helps consumers and producers of techno music make sense of electronica complexity. Without the cultural mediation available in expert discourse found in techno media, both artists and engineers would be alienated in an otherwise ambiguous genre of postmodern cultural production.

To recapitulate, the complexity of the techno musical instrument, hybrid electronica, and the desire to utilize, adapt, develop, or otherwise interact with this instrument; has resulted in the unification of distinct artistic and technological communities whose integration has been made harmonious through shared expression found within a newly emerging techno vocabulary involving artistic and technological discourse. Through the cultural mediation of experts, available in techno media, the genre of techno music (through its related discourse) has become an important postmodern mechanism for social inclusion among historically fractured (and to some degree marginalized) artistic and technological communities and their respective social agents. To demonstrate support for this hypothesis, techno media was analyzed using the social scientific tool of content analysis. Expert testimony presented in techno media was examined in light of the cultural mediation paradigm, and results are presented below.

METHODOLOGY

Techno media was gathered and a representative sample was identified from the following batch of periodicals: *Music and Computers*, *Sound on Sound*, *Ray Gun*, *Keyboard*, *Future Music*, and *Mix Magazine*. 1,782 relevant pages were extracted and subjected to content analysis. Contents were

evaluated along the processual dimensions provided in the cultural mediation paradigm presented elsewhere in this paper. The article text and headlines were scanned to determine if experts through critical coverage mediated techno complexity, and if so, how that critical mediation was presented. Text was evaluated to determine how the genre's media and its related discourse fulfilled the criteria for differentiation, perception, evaluation, and rewards.

Content that enabled consumers to distinguish cultural objects from each other were categorized as part as the process of cultural mediation known as *differentiation*, while content that enabled consumers to interpret cultural products within frameworks of familiarity were categorized as part of the process known as *perception*. Similarly, content that revolved around status enhancement, prestige, or other opportunity for recognition was categorized as *rewards*. The most prevalent category encountered, however, was part of the process of cultural mediation known as *evaluation*. Criteria to categorize content included the knowledge base of writers (i.e. reviewers/editors/technician expertise), objective of the articles (i.e. evaluate software, compare hardware, motivate participation in competition), and the information contained (i.e. innovation announcement, judgment dissemination, utilization reviews).

RESULTS

Once headlines and text were dichotomized into the necessary categories, two of the four processes were found to represent relatively straight-forward reporting, without significant filtration or interpretation through critical expert testimony. The media content fulfilling the criteria for perception and rewards were not culturally mediated whatsoever. Furthermore, perception and rewards had little to do with the critical mediation of the *instrument* involved in techno music production. Because the instrument was not featured, complexity was not a significant factor, hence there is no need for expert testimony in interpreting cultural artifacts. Instead, the process of rewards within cultural mediation typically involved announcements of upcoming competitions. Similarly, the process of perception typically involved well known musicians who were used to associate and familiarize the consumer with

particular forthcoming cultural artifacts (i.e. CD promotion). The instruments used in the production of these CD's, while merely mentioned, were not the primary focus of these articles. Perception processes, rather than fulfilling any particular need for critical evaluation, served instead as a legitimation strategy. Often this legitimation went beyond the boundary of techno, and incorporated musician and producers from other more mainstream musical genres as well.

The content that dealt with the cultural mediation process of differentiation, however, did tend to focus on the instrument. The actual critical mediation was limited however, as this process was merely an opportunity to announce the development of 'cutting edge' technologies soon expected on the market.

TABLE 1
Cultural Mediation Processes by
Individual Techno Periodicals

	DIFFERENTIATION	PERCEPTION	REWARDS
MIX 10/99 v67	Mirror Maker takes a piece of music and reverses it's scalar step sequence	Jamiroquai	Ray Dolby Awards
	Digital Watermarking is security software that etches digital information into an audio file which can be read by special software, thereby designating authorized users.	Lisa Stansfield	
	Ceramic coated CD's		
FUTURE MUSIC 06/98 v70	Sibelius 7 the ground-breaking musical word processor	Kraftwerk	MOBO Awards
	Koan Pro 2 the music authoring system	Björk	
	Smart Content encoding replicates the finest acoustic details of live performance. Engineers designed the codes by taking internal measurements of clubs/arena/garages and then converted these measurements into codes that tells the DVD player to gate some frequencies and amplify others and add delay before the sound reaches the speakers, thus reproducing live sound.	Funkadelic	
KEYBOARD 07/98 v07	Ensoniq PARIS [Professional Audio Recording Integrated System] An all in one simplified package that turns your computer into a digital audio workstation.	Madonna	John Lennon / EMI Song of the Year

Differentiation, in the case of the techno media examined, was actually a preparatory stage, acclimating and preparing consumers for the inevitable technological changes to expect in newly released SOHE electronica technological innovations. This preparation process of differentiation distinguished new and innovative cultural objects from those already in existence, but did not specifically do so from the perspective of the expert. *Access* to the new technology seemed to be the only significant barrier

limiting full critical discourse. The information about what to expect, as disseminated by the manufacturers, and without the trusted and judicious assessment of experts, is cautiously described to consumers. Table 1 provides subject matter of representative issues of techno media analyzed in light of the cultural mediation processes outlined thus far.

The cultural mediation process of evaluation, on the other hand, is the most salient, complex, and extensive section of the issues of techno media sampled for this analysis. The evaluation is entirely about the instrument. It is through the discourse that the instruments are evaluated. Costs, performance, features, technical ability, compatibility, and ease of use are meticulously compared, elaborated, and assessed. Specific interests of consumers are taken into account, and the depth and breadth of those involved in the production of techno music is well understood. Culture, economics, social preferences, intended audiences, their ethnic ties, the consumption environment, consumer capabilities, absorption limitations, technical formats, and taste are distinctly taken into account; and hence, it is here that cultural mediation is in full effect.

TABLE 2
Evaluation as Cultural Mediation Process
by Individual Techno Periodical

	EVALUATION
MIX 10/99 v67	Compatibility of new equipment to Mac/Pentium platforms
	Multiband compressors
	Format comparisons regarding DVD DAT minidisk, cd rom, hard disk
	Limiter algorithms
FUTURE MUSIC 06/98 v70	Upgrading of PC platform with a set of 909 sounds plus the legendary shuffle function for those funky house tunes. The 909 can be assembled in loops and grooves, distorted and shuffled, then saved as WAV files.
	Delivers all classical waveforms
	Freedom to control combinations of front panel parameters for maximum expression
	It also has a built-in ADAT sync port, a video reference input, and the nine pin card which means you can control nine-pin compatible audio and video products from your sequencers.
	Performance oriented arpeggiator for heart pumping techno applications
	How to give your tracks low frequency oomph
	They defined the bottom end sound of speed garage
	Surely you are not laboring after all that digital stuff in this age of lo-fi analogue grunge.
	The only way to get realistic guitar is to sample the real thing which obviously is not very practical as most synths don't seem to recreate guitars very well. Guitars are one of the most fundamental instruments in music and I'm surprised synth manufacturers aren't queuing up to crack that area.
	An audio scrub feature with waveform display helps you exactly pinpoint the edit mark both visually and aurally.
	Alternatively, the EQ is not so detailed and it uses a JAZ drive; higher capacity but ten times the price. Neither does it have any built-in effects.
	Older British consoles historically sounded better because of the design of equalizer [EQ] filters. Ever since,

	console manufacturers have been falling over themselves to include the words "British EQ" somewhere on their spec sheets.
	There's a built-in SCSI interface and optional digital and analogue output expansion boards.
	Professional results and very quiet in operation having almost noiseless circuitry and a smooth quiet disk drive.
	One way of judging a new piece of kit is seeing what safety net it offers when things go wrong. You can keep the take but do a re-record on another track or you can undo 999 steps.
	The synth incorporates five different forms of sound generation, including new voice technologies and synthesis.
	Optionally, the sockets can be converted to receive control voltages and Gate, so then you can control it from a vintage synth, but not vice versa.
	The sound of the oscillator is satisfying and does much to enrich what otherwise might be quite weedy.
	There's a complete digital effects processor and the unit also includes Spirit's patented preamp. This gives you maximum flexibility over the use of auxiliaries for external processing or foldback and monitoring.
	It generated a fair amount of hiss that's particularly obvious when playing bass lines in isolation.
	It combines different effect types which further complicates operation. This may sound like a complaint but it isn't really. It just illustrates the cramming that has to occur to bring down the price of one of these boxes.
	Increase the resonance above '8' and it will whistle, whine, and wail. Forget the manual and just twiddle and groove.
	The sound of a synth is defined by nature of its filter, which was not squelchy.
	Given software bloat, it is refreshing to find programs that are affordable with features that don't hog memory.
	All control knobs are color coded with raised and contrasting pointers with center indents when necessary.
	There's a file conversion utility which should provide near universal compatibility.
	In our zeal to find a way into music for those who can't read a note, we often overlook those who are fully conversant with standard notation. You don't have to pay a hefty premium for sequencers that allow you to communicate in your 'native language'.
	Take a look at the physics of it all. Low frequencies are audible from 20Hz upwards and the transition into mid frequencies is at about 300 Hz. Anything below that range goes into sub-sonics and includes sound that you feel as rumbles, like earth tremors or the baseline at the disco three doors down.
	The filter resonance is set high, but just short of self-oscillation with note velocity assigned to the cutoff.
	If you combine all these hints in one monster patch, you should be getting near to the perfect big fat synth bass sound.
	It won't win any attractive interface awards, but you can use this to add welly to your frequency.
KEYBOARD 07/98 v07	You can make something very unlistenable by quantizing too much.
	Then that magic starts happening, when the sum becomes greater than its parts. The vocals are going through a scanning device on one side only. All the tremelo you hear is the signal back and forth across the stereo field. There's something about transient peaks that make that machine scream.
	Harmony is a way of explaining things that work, but there are things that work that harmony doesn't have an explanation for.
	Great sound, sexy new algorithms, responsive real time modulation, and excellent front panel ergonomics.
	Multitimbral tone generators that can generate several different instrument sounds on different channels have changed the face of the synth industry.
	Every synth has that little G spot where subtle slight tweaking of two parameters takes you through a huge range of sound.
FUTURE MUSIC 3/98 v03	I think the manufacturers are finally listening to musicians and making synthesizers to play, and putting the spontaneity back into keyboards.
	Bob Moog, the man who developed the Moog synthesizer, is introducing a new line of theremins and theremin accessories.

In Table 2, text exhibiting expert cultural mediation has been extracted. The instrument, its use and its features are clearly the overwhelming focus of the discourse. In examining the quantity, clarity, and specificity of critiques, it is apparent that expert knowledge was solicited in order for the content to be adequately interpreted for techno consumers.

DISCUSSION

The text and subject matter presented in Tables 1 and 2 provide support for the processes of cultural mediation. In the case of cultural production of techno music, the primacy of evaluation is highlighted in techno media. Several relevant postulates can now be asserted. Evaluation occurs through discourse which increases in complexity, as tools needed to produce artifacts (the instrument) increase in complexity. The more that media focuses on the instrument producing techno music, the more important expert testimony is in deciphering its uses. In cultural music production, the more complex the instrument, the more complex the vocabulary developed in the course of constructing discourse. Similarly, the more fluency the critic exhibits in clarifying the rhetoric of the discourse, the more valuable the critic. The extent to which the critic understands instrument complexity determines the clarification, interpretation, and value of expert scrutiny. Furthermore, access to experts most highly esteemed in the techno industry is most readily available through techno media.

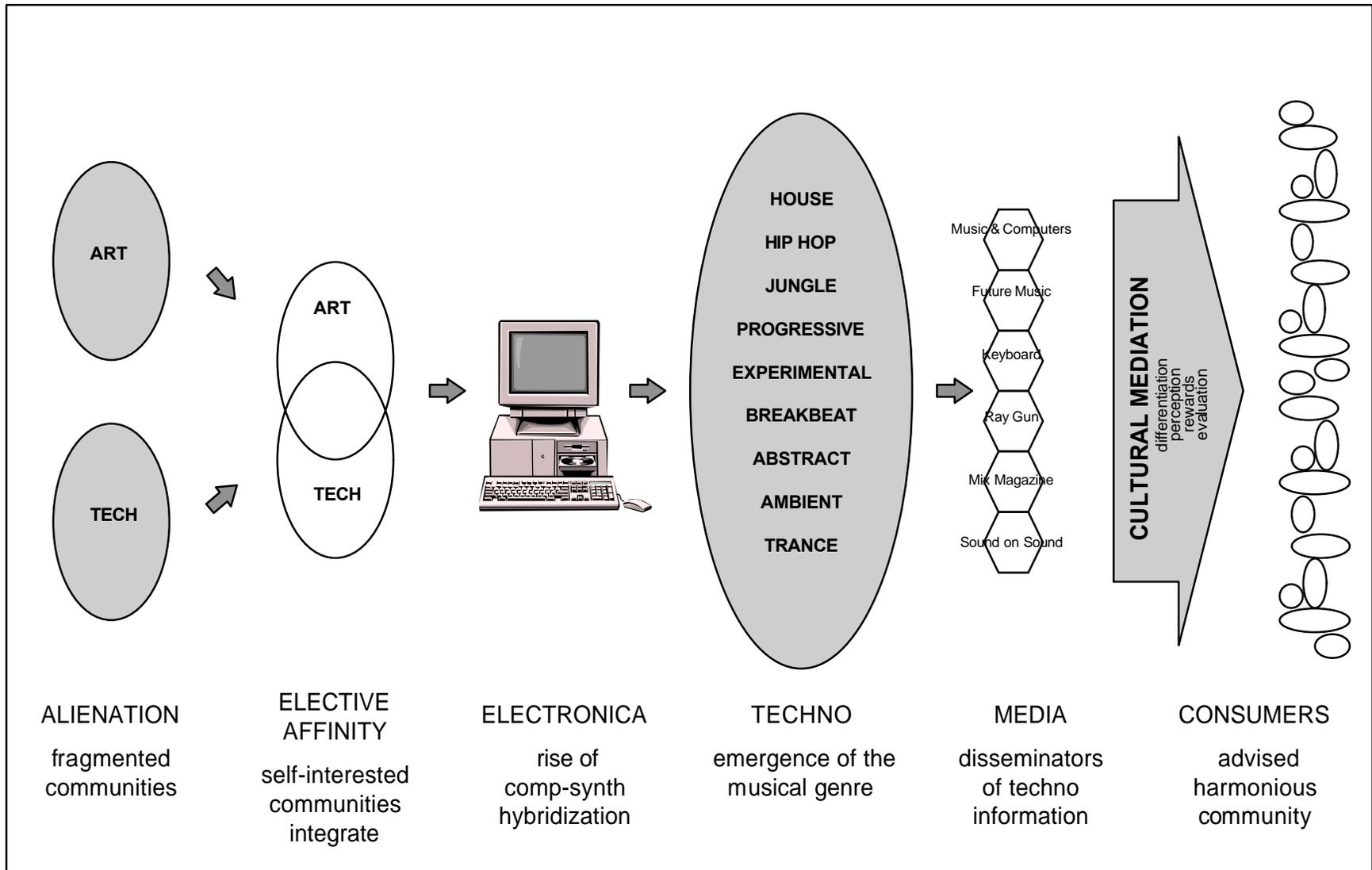
Postmodern *trust* is solidified by the financial stake in the techno industry. The instruments and related accoutrements can range from \$5 to a quarter of a million USD. The potential profits to be made from the acquisition of these instruments also inflates the value of critic discourse and related clarification considerably. The financial risks associated with decision-making on instrument acquisition in a scarce resource environment under conditions of extreme artistic, economic, and technological uncertainty; further solidifies social bonds through trust in critical expert discourse.

To clarify these unified social bonds among previously fragmented communities through elective affinity, the instrument innovation that was advanced through this collaborative arrangement, and the cultural mediation processes that manifest as a result of inherent complexities; Graph 1 demonstrates, with greater specificity, relationships solidified in the process of cultural production within the genre of techno music. Through a rational pursuit of self-interest, an elective affinity integrates previously fractured artistic and technical communities. The innovative community develops and refines electronica hybridization. This innovative instrument enables the genre of techno to emerge. Techno and her typologies gives rise to techno media, which makes expert discourse available to those involved in such

cultural production. Through discourse and related expertise, culture is mediated and thus, cohesion among the techno community is observed.

Graph 1

Community Integration, Instrument Innovation,
Artifact Production, Expert Elevation, and
Consumer Mediation in the Techno Music Industry



CONCLUSION

The classical theories presented in the current treatment have significant relevance to the contemporary genre of techno music. Although the analysis presented was not able to comprehensively dispute the Hegelian notion of antagonism as a necessary state for the pursuit of human knowledge, the case of techno does provide, nevertheless, substantial support for the Marxian position where cooperation and harmony is viewed as the necessary state to facilitate the production of cultural artifacts and hence optimize the potential for human creativity. The case of techno music, however, provides evidence to fully dispute Marx's notion of mechanistic complexity as a *barrier* to human creativity. On the contrary, the analysis focusing on techno music suggests that inherent mechanistic complexity *enhances* the potential for human innovation in the production of cultural artifacts. Here antagonism diminishes as rationally self-interested communities concentrate resources around the development and optimal use of the techno musical instrument, hybridized electronica. This harmonious cooperation occurs through fluency in relevant hybrid vocabulary and artistic/technological discourse. Discursive elements are guided by expert critics who provide cultural mediation (primarily through evaluation) to the techno community. The techno community accesses highly valued critical discourse through techno media. Trust further solidifies these communities, as financial, technological, and artistic risk under conditions of extreme postmodern uncertainty is minimized.

Hybrid electronica, developed and refined through the process of cultural mediation, has led to cohesion among consumers, producers, engineers, and artists concerned with techno cultural production. This article was intended to discredit the contention that technological complexity is universally responsible for postmodern alienation and the rise of fragmented communities in our social world. Although fragmentation and alienation by some measures appears to be on the increase, there remain areas of contemporary cultural production where technology is celebrated as a *source* of unity and integration across technical, artistic, cultural, ethnic, gender, and racial boundaries. The individuals involved in the genre of techno music, centered around the demystification of complexities inherent in its instrument, is one such example of mechanistic technology enhancing the social, cultural, and economic

status of those involved. Substantial caution should be exercised therefore, before ubiquitously criticizing music technology and overlooking its beneficial consequences to postmodern music. Information technology, in the case of techno music hybridization, has not rendered mechanisms of human expression obsolete, but has instead become *another* creative vehicle by which to make musical (and hence cultural) expression possible.

Though IT and related technology may have indeed caused alienation and fragmentation in some industries, it has had a diametrical effect in music. Computer technology has actually unified fragmented communities involved in techno music production, increased the quality of manufactured goods available to produce techno music, and facilitated cooperation across artistic and technological community factions. Through hybridization of computer-synthesizer electronica, elective affinities have flourished. This has resulted in comprehensive collaboration arrangements and prolific works of music production, thus optimizing aesthetic potential and maximizing opportunities for human creativity. Furthermore, reliance on major record labels to produce and disseminate cultural products is no longer required, due largely to electronica production technologies made available. With this increased autonomy, comp-synth hybrids continue to dramatically transform the music industry. It will be important to observe what effect these evolutionary changes have for future elective affinities or further cooperation among art/tech communities within the music industry. More research incorporating cross-cultural techno media may answer these questions or perhaps lend further support to the assertions presented in this analysis. In and of itself, the techno industry has not necessarily been proven to be capable of returning humanity to a state of utopian equilibrium, but this preliminary investigation involving a small sample of English-language techno zines makes a significant contribution, nevertheless, in demystifying the unique role of the synthesizer and its crucial influence in unifying fragmented communities engaged in cultural expression.

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