



Music as a Revenue Driver: The Evidence Behind Restaurant Sound

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Introduction

At Chordant, we believe that music should do more than fill silence—it should actively support your business objectives. Unlike traditional background music services that rely on manually curated playlists or one-size-fits-all programming, Chordant uses intelligent algorithms to automatically select and adapt music based on decades of research in consumer psychology, environmental psychology, neuroscience, and marketing. Scientific studies have consistently shown that characteristics such as tempo, energy, familiarity, genre, and emotional tone influence how customers perceive an environment, how long they stay, how they interact with employees and other customers, and ultimately how they spend their time and money.

This white paper provides an overview of key research and findings done in this field specifically in regards to restaurants. We begin with foundational early pioneering work and continue to modern, cutting-edge investigations being done around the world. We summarize the papers and methodologies, highlight the desired outcomes being studied, and identify the musical characteristics that drive the desired outcomes. Finally, we discuss how Chordant applies these evidence-based principles to create music experiences that align with each business's goals.

Foundational Studies

Around the 1960's and earlier, research into the effects of background music in commercial environments primarily focused on worker morale and mood. Businesses were focused on improving productivity. This question became more pervasive as developed nations started to transitioning their economies from manufacturing to office-oriented settings. Can music make workers happier, and are happier employees more productive?

Researchers started exploring the relationship between music and consumers in the 1960's. Among them was Ronald Milliman, a trailblazing professor of marketing at Western Kentucky University. In the 1970's and 1980's, he evolved prior research in three ways:

- Dove deeper at the connection between music and consumers, not just producers.
- Investigated qualities of the music itself (tempo). Early music research investigated environmental factors such as the volume at which music was played.
- Most importantly, Milliman tied music directly to behavior, extending beyond mood. Mood was just a bridge between the cause (music) and effect (behavior).

The result were two landmark published studies that are still often cited today.

The first was [Using Background Music to Affect the Behavior of Supermarket Shoppers](#) in 1982. This study was the first to show an effect that music tempo had on shopper behavior. Milliman observed shoppers in a supermarket over a two-month period. He controlled for time factors, seasonality, and musical variety, leaving only music tempo as the independent variable to test. He mapped tempo to three outcomes: pace, gross sales, and whether a subject noticed the music. Although no conclusion could be drawn between the mere presence of music and the three outcomes, he did show a high statistical significance between slow and fast tempo music. Slower tempo meant slower pace and higher sales volume. Faster tempo meant higher pace, and lower sales volume.

His next study in 1986, [The Influence of Background Music on the Behavior of Restaurant Patrons](#) expanded on his previous work to examine restaurant patron behavior. Again, Milliman designed the test to only examine the effects of music tempo on customer behavior. He looked at six possible effects and found significant relationships in three. Tempo had a negative relationship with dwell time, alcohol purchases, and gross margin. In other words, slower tempo increased patron dwell time, alcohol purchases, and gross margins.

One interesting aspect that did not have a relationship with tempo was total food purchases despite increased dwell time. Milliman reasoned that there was only a finite amount of food one can eat in a dining session no matter how long one stayed at a restaurant. However, slower music produced a more relaxed, less guarded environment, which facilitated alcohol sales. The higher margins in alcohol helped increase gross margins.

Second Generation Research

Milliman's research was so groundbreaking, he set off a flood of research probing the relationship between music and human behavior in the consumer space by both psychologists and marketers. This new batch of research not only explored retail and dining sectors, but scientists studied whether Milliman's findings would hold true in any space with customers. Bars, hotels, casinos, among many other spaces were investigated. In the restaurant industry, several studies followed up and support aspects of Milliman's 1986 study.

[Fast Music Causes Fast Drinking](#) from 1992 supported Milliman's alcohol-related findings from his 1986 paper. Milliman asserted that slow tempo related to more alcohol sales. A slow tempo created a more relaxed atmosphere, making it socially acceptable to order alcohol. With an increased dwell time that slow tempo also caused, alcohol consumption

would lengthen and slow. From the opposite standpoint, it would reason that fast tempo would speed up drinking. This study conducted in Quebec found significant evidence supporting this in a bar situation.

In 1996, *The Effect of Music on Atmosphere and Purchase Intentions in a Cafeteria* explored music genres. The studied tied genres (pop, easy listening, classical, no music) to over a dozen qualities describing the dining atmosphere of a university student cafeteria in England. The results were diverse and mixed. However, most importantly, the study demonstrates the need for commercial music. Total revenue was higher with music (no matter the genres or listener preferences) than no music at all. Classical and pop music had a very high impact on revenue. Easy listening music had less of an impact, but still significant.

Modern Studies

Around the turn of the century, research design evolved and research began to look at what other factors music might affect. Additionally, other independent variables beyond tempo and volume were tested. Perhaps most importantly, statistical technical complexity and rigor increased even further.

The Influence of Music Tempo and Musical Preference on Restaurant Patrons' Behavior in 2002 by Caldwell and Hibbert was a study conducted at a restaurant in Scotland that directly tested and extended Milliman's study. This study combined a number of factors and outcomes. Musical preference was introduced as a factor to be studied along with the already well-studied temp. Like in Milliman's study, dwell time and money spent were tested and two new dimensions were investigated – perception of time spent and evaluation of dining experience. Time and seasonality, volume, and environmental factors were controlled as well as the type of music. The playlist was limited to Ella Fitzgerald jazz to isolate tempo.

The study once again showed tempo and dwell time shared a negative relationship – the slower the tempo, the higher the dwell time. Additionally, music preferences was also shown to have an impact on dwell time with a positive relationship. The more customers liked the music, the more time was spent dining. The combination of both tempo and preference was investigated for interactive affects. None were found, strengthening the idea that they are both independently powerful predictors of dwell time.

In regards to perceived time, neither tempo nor music preference were found to have an effect.

Caldwell and Hibbert’s study found relationships with amount spent for both food and alcohol with both tempo and music preference. Slower tempo and positive music preference independently increased both food and alcohol sales. This runs slightly counter to Milliman’s discovery that a slower tempo did not increase food sales, but still does not counter his overall assertion that gross revenue increases with slower tempo.

Forty years later, do Milliman’s claims still hold? [*How Does Background Music Affect Dining Duration, Tips and Bill Amounts in Restaurants? A Field Experiment*](#) in 2024 examined this question in a contemporary restaurant setting. Yet again, the relationship between tempo and dwell time was tested along with tempo and amount spent. This study, however, dissected the total bill into food, alcohol, and tip amounts.

The study also deviated from Milliman and Caldwell in their designs. While the formers tried to control for a number of factors to isolate the effect of the independent variables, this study tried to apply more varied, real-world factors. Observation occurred at every day of the week, sample size was increased, and group factors were controlled.

Again, slower tempo was found to increase dwell time. It is safe to say at this point this relationship is strong, being well-tested across multiple environmental situations and decades. Differing from Milliman and Caldwell, the authors found no relationship between tempo and total bill nor tempo and alcohol purchases. The authors note that this does not necessarily contradict previous studies due to the modified environments between all three studies.

By deconstructing the total bill, the researchers discovered a new relationship: tempo and tip amount had a positive amount on the tip left by patrons. Several explanations were offered for this. First was grounded in Associative Network Theory from the early 1980’s. Briefly, the theory argues that emotions are organized in network nodes. Faster music may disrupt communication between nodes by overloading the network, thus causing people to act more impulsively and generously. Secondly, an increased tempo may give the perception that service is faster, and thus, worthy of increased tips.

Study Summaries

The relationship results from these studies across decades can be summarized in the following table:

Variable	Dwell Time	Total Spent	Alcohol Spent	Tips
Tempo	Negative	Positive	Positive	Positive
Presence of Music	Positive	Positive		
Appeal of Music	Positive	Positive		

Shades of green indicate that the relationship was investigated by multiple studies. Darker shades mean no conflicting conclusions. Lighter shade indicates conflicting conclusions that can be explained by experiment design. No shading means affect not tested beyond one study.

How Chordant Applies These Results

Our fundamental belief is that music is a profit driver. Our framework extends our core value from a cost-minimization function to direct revenue-generation. By mapping client-specified target demographics and strategic KPIs to our algorithmic curation engine, we systematically optimize auditory stimuli to influence consumer behavior.

This proprietary selection pipeline integrates domain-specific musicological heuristics with predictive machine learning models, leveraging years of cross-disciplinary research in acoustic engineering, behavioral data science, and signal processing.

High-Dimensional Data Categorization

Empirical research consistently identifies tempo and demographic appeal as the primary variables influencing patron behavior. While conceptually straight-forward, operationalizing these dimensions within a commercial environment requires a high-fidelity data architecture.

The selection pipeline begins with an intensive metadata-tagging process. Each audio asset is mapped to a highly structured array of machine-readable descriptors.

Tempo is quantified via beats per minute. BPM serves as the most stable and straightforward predictor of physiological and behavioral pacing.

Optimizing for demographic appeal introduces significantly higher dimensionality due to subjectivity between our clients and their customers. Standard macro-genre classifications (e.g., “rock” or “country”) lack the granularity required for high-precision behavioral targeting. To bypass the limitations of broad categorization, the classification process utilizes a deep relational network of micro-genres.

This network classifies music assets not only by broad categories, but also captures variations across multiple axes:

- Regional/Geographic: Regional variations, local trends, and cultural distributions
- Temporal: Broad era-specific production styles and historical contexts

- **Derivative Styles:** Historical stylistic evolution trends within parent genres
- **Hybrid and Crossover Works:** Musical innovation often exists at the intersection of multiple parent genres

By resolving genre classifications into this complex, interconnected network, the system achieves the high-resolution targeting necessary to optimize for both auditory appeal and client brand alignment.

Smart, Dynamic Selections

Following ingestion and metadata tagging, the selection engine queries the catalog to match tracks against targeted behavioral profiles. Rather than relying on a uniform playlist across all endpoints, the curation logic is highly configurable. The system can dynamically adapt playback queues at individual locations by accounting for two primary variables:

- **Dayparting:** The engine automatically shifts energy, tempo, and style curves to match local time-of-day requirements and shifting customer traffic patterns.
- **Geographic and Regional Preferences:** Playlist generation parameters can be customized per location to align with regional demographics, local cultural contexts, and site-specific operational goals.

Telemetry, Log Analysis, and Performance Attribution

Beyond maintaining system health and high availability, our continuous log monitoring infrastructure captures valuable interaction and playback telemetry. This telemetry data can be cross-referenced with your business metrics to measure the real-world impact of your acoustic programming.

- **Behavioral Attribution:** Playback logs can be correlated with client-side datasets—such as point-of-sale (POS) transaction records, hourly foot traffic, and average dwell times.
- **A/B Testing and Optimization:** By analyzing revenue and traffic patterns alongside localized playlist history, we can help you evaluate which acoustic variables (such as tempo, genre, or energy levels) yield the highest conversion rates and customer engagement.
- **Continuous Feedback Loop:** This data integration allows us to iteratively adjust and refine your acoustic curation parameters, ensuring the platform continuously adapts to align with your target customer profile and primary business goals.

Conclusion

The research is clear on one point above all others: music is never neutral. From Milliman's original supermarket and restaurant studies in the 1980s through the most recent 2024 field experiment, four decades of work across different countries, restaurant types, and research designs keep landing on the same core finding—tempo shapes how long people stay and, in most cases, how much they spend. What's changed over time isn't whether music matters, but how precisely we can measure its effects. Later studies added music preference, genre, and bill composition to the picture, and even when a specific finding shifted—like the 2024 study's discovery that tempo now predicts tips rather than total spend—it didn't undercut the central relationship, it refined it. That's the real takeaway for restaurant operators: music isn't ambiance to set once and forget, it's a variable that can be tuned deliberately toward specific outcomes, whether that's turning tables faster during a lunch rush or encouraging guests to linger over a second bottle of wine. Chordant's approach is built on treating it that way—using the tempo and preference signals this research has validated, at the scale and consistency a human curator can't match on their own.

READY TO LEARN MORE?

To learn more about Chordant.Music, visit us at <https://chordant.music>.

Sample streams are available for preview 24/7 at <https://chordant.music/resources>.

You can always drop us a line at hello@chordant.music.

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