1. Introduction

Market sentiment plays a critical role in shaping trader behavior, particularly in highly volatile markets such as cryptocurrencies. Periods of fear and greed often influence decision-making, risk appetite, and overall trading outcomes. Understanding how traders respond to these emotional market states can provide valuable insights into behavioral patterns and potential inefficiencies.

This analysis explores the relationship between market sentiment and trader behavior using two datasets: a Bitcoin Fear & Greed Index representing overall market psychology, and historical trade-level data from the Hyperliquid trading platform. The objective is to examine how profitability, trading activity, and risk-taking behavior vary across different sentiment regimes.

By combining market sentiment data with granular trader activity, this study aims to identify behavioral trends that could inform more disciplined trading strategies and improve decision-making in volatile market conditions.

2. Data Overview

Two datasets were used in this analysis to examine the interaction between trader behavior and market sentiment.

The first dataset consists of historical trade-level data from the Hyperliquid trading platform, containing over 211,000 individual trades spanning from May 2023 to May 2025. Key variables include execution price, trade size in USD, trade direction, transaction fees, and realized profit and loss (PnL). Each trade is timestamped, allowing for precise alignment with daily market sentiment.

The second dataset is the Bitcoin Fear & Greed Index, which provides a daily measure of market sentiment ranging from extreme fear to extreme greed. This dataset spans a broader period from 2018 to 2025 and includes both a numerical sentiment score and a categorical classification. For the purposes of this analysis, sentiment classifications were standardized into two primary regimes: Fear and Greed.

The sentiment dataset fully covers the time range of the trading data, enabling a consistent day-level merge between trader activity and market sentiment.

3. Methodology

The analysis followed a structured workflow designed to minimize noise while preserving meaningful behavioral signals.

First, raw trade-level data was cleaned and standardized. Trade timestamps were converted into date-level fields to enable alignment with daily market sentiment. Only relevant variables related to profitability, trade size, and activity were retained to maintain analytical clarity. Trades without corresponding sentiment data were excluded, resulting in a negligible loss of observations.

Market sentiment classifications were standardized into two regimes—Fear and Greed—to ensure consistent comparison across time. Each trade was then enriched with the corresponding daily sentiment context.

To reduce intraday volatility and avoid overemphasizing individual trades, trade-level data was aggregated at the daily level. Key daily metrics were computed, including total trading volume, number of trades, average trade size, total realized PnL, PnL volatility, and win rate. This aggregation enabled robust comparison of trader behavior across different sentiment regimes.

Finally, comparative visual analysis was used to evaluate differences in profitability, activity, risk-taking, and decision efficiency between Fear and Greed periods.

4. Key Findings

The analysis reveals clear and consistent differences in trader behavior across Fear and Greed sentiment regimes.

Profitability:
Daily profitability was more stable during Fear periods compared to Greed periods. While Greed days exhibited extreme positive and negative outliers, Fear days showed a higher median daily PnL with reduced downside risk. This suggests that traders tend to behave more cautiously and consistently during fearful market conditions.

Trading Activity:
Trading volume was significantly higher during Fear periods. Fear days exhibited both higher median daily volume and more frequent extreme volume spikes, indicating increased market participation. This behavior is consistent with traders actively repositioning, managing risk, or responding to heightened volatility during periods of uncertainty.

Risk per Trade:
Average trade size did not materially increase during Fear periods. Instead, risk exposure during Fear was driven by higher trading activity rather than larger individual positions. In contrast, Greed periods showed occasional extreme trade sizes, suggesting confidence-driven position sizing and concentrated risk-taking.

Decision Efficiency (Win Rate):
Greed periods exhibited a slightly higher median win rate; however, this did not translate into superior profitability. Losses during Greed were larger when they occurred, offsetting higher win frequencies. During Fear periods, traders achieved more stable outcomes despite slightly lower win rates, highlighting stronger risk control.

5. Conclusion & Trading Implications

This analysis demonstrates that market sentiment plays a significant role in shaping trader behavior and performance. Fear and Greed regimes are associated with distinct patterns of activity, risk-taking, and outcomes.

Fear periods are characterized by higher trading activity, controlled position sizing, and more stable profitability. Traders appear to adopt disciplined strategies, prioritizing risk management over aggressive gains. In contrast, Greed periods exhibit lower overall activity but greater outcome volatility, driven by occasional oversized positions and overconfident risk-taking. Although win rates are marginally higher during Greed, larger losses offset these gains, resulting in less consistent performance.

From a trading strategy perspective, these findings suggest that sentiment-aware risk management can improve outcomes. Traders may benefit from tightening risk controls during Greed phases and leveraging heightened liquidity during Fear periods without increasing individual position sizes. Incorporating sentiment indicators as a contextual signal—rather than a directional predictor—can support more disciplined and resilient trading strategies in volatile crypto markets.