Trader Behavior Analysis under Market Sentiment (Fear vs Greed)

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Dataset: Hyperliquid Trading Data & Bitcoin Fear–Greed Index

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1. Introduction

Objective

The objective of this analysis is to examine how trader performance, risk-taking behavior, and consistency relate to market sentiment conditions such as Fear and Greed.

The study aims to identify traders who perform well under different market regimes, detect consistent performers, and extract patterns that could support smarter trading strategies on Web3 trading platforms.

2. Datasets Overview

2.1 Historical Trader Data (Hyperliquid)

Account (Trader ID)

Symbol

Trade side (Buy/Sell)

Trade size

Execution price

Closed PnL

Timestamp

This dataset captures real trading behavior, profitability, and risk exposure.

2.2 Bitcoin Fear & Greed Index

Date

Sentiment classification (Fear, Extreme Fear, Greed, Extreme Greed)

This dataset represents overall market psychology.

3. Data Preprocessing & Limitation

3.1 Cleaning & Feature Engineering

- Standardized column names
- Converted timestamps to date format

Engineered:

- is_profitable
- risk proxy based on trade size and PnL

3.2 Data Limitation Identified

- During preprocessing, a temporal mismatch was identified between the two datasets.
- Trader data spans recent periods (2024)
- Fear & Greed Index data spans earlier periods (2018)
- Due to the lack of overlapping dates, direct date-wise sentiment attribution was not possible.
- Instead of forcing an incorrect merge, the analysis proceeds by:
- Empirically analyzing trader behavior

Conceptually mapping observed behaviors to Fear and Greed regimes based on established market psychology

4. Analysis & Findings

4.1 Overall Trader Performance

- Profitability is highly skewed
- A small group of trades contributes disproportionately to profits
- Loss distributions show asymmetric downside risk

Interpretation:

Such distributions are typical of sentiment-driven markets, where extreme Fear and Greed amplify volatility.

4.2 Risk-Taking Behavior

Large trade sizes correlate with higher PnL variance

High-risk trades do not guarantee higher average returns

Interpretation:

In Greed-driven markets, traders tend to overexpose capital, increasing volatility without proportional reward.

4.3 Consistent Performers

A subset of traders shows:

Positive average PnL

Higher win rates

Stable performance across trades

5. Sentiment-Based Interpretation

Although direct sentiment mapping was not possible, established market behavior suggests:

Fear Regimes

Higher volatility

Selective opportunities for skilled traders

Better risk-adjusted returns for disciplined strategies

Greed Regimes

Increased trade frequency

Larger position sizes

Higher downside risk due to overconfidence

6. Strategic Insights for Smarter Trading

Key Patterns Identified:

Consistency and risk control outperform aggressive trading

Trade frequency does not guarantee profitability

Downside protection is more important than upside chasing

Sentiment-aware systems can dynamically scale exposure

7. Conclusion

This analysis demonstrates how trader behavior, risk exposure, and consistency can be leveraged to design smarter trading strategies.

Even with imperfect data alignment, meaningful insights can be extracted by combining empirical analysis with sentiment-aware interpretation.