Web3 Trading Data Science Internship

Full Analysis Report: Trading Behavior vs Market Sentiment

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1. Introduction

This report investigates how trading behavior—profitability, volume, volatility exposure, and general activity—aligns or diverges from market sentiment represented by the Fear & Greed Index. Crypto markets are highly emotional, and studying behavioral reactions to sentiment can reveal predictive signals useful for algorithmic trading, risk management, and market timing.

2.1 Trading Dataset Cleaning

The trading dataset consisted of raw execution-level Hyperliquid trades. Key columns such as execution price, USD size, token size, realized PnL, and trade direction were standardized. Timestamps were cleaned and normalized into daily format to enable daily aggregation.

2.2 Daily Aggregation

Daily-level signals were generated by aggregating all trades per day. These include: • Daily Close Price • Daily High/Low Price Range • USD and Token Volume • Net Realized PnL • Number of Trades This converts noisy intraday trade data into structured market behavior metrics.

3. Sentiment Integration

The Fear & Greed Index dataset was merged with daily trading metrics using as-of merging. Sentiment Z-score was computed using rolling standardization to detect extreme fear and greed periods.

4. Feature Engineering

Returns, forward returns, volatility, and extreme sentiment labels were created to quantify market reactions. • ret_1d_fwd: next-day return • ret_5d_fwd: 5-day return • sent_z: standardized sentiment score • Extreme Fear/Greed: top and bottom 5% of sent_z

5.1 Price–Sentiment Relationship

Price trends generally follow sentiment direction. Uptrends appear during sustained greed, while selloffs and capitulation align closely with fear spikes. Sentiment moves more smoothly than price, suggesting sentiment often leads price action.

5.2 Volume & PnL Behavior

Fear periods show elevated trading volume, indicating panic-driven activity. Traders incur larger losses during fear than greed, confirming emotional and herd-based

decision-making.

6. Event Study: Extreme Sentiment Days

Key Findings: • Extreme Greed → negative next-day and 5-day returns. • Extreme Fear → strong positive rebound results. Fear-driven periods consistently provide statistically significant reversal opportunities.

7. Behavioral Signals Identified

1. Sentiment acts as a leading indicator around market turning points. 2. Volume spikes confirm valid fear events. 3. PnL patterns show traders react emotionally and often suboptimally. 4. Sentiment can be converted into actionable trading signals.

8. Trading Strategy Insights

A simple contrarian strategy—long during extreme fear and short during extreme greed—shows positive cumulative returns even without optimization. Volume filters improve accuracy, and sentiment can also serve as a risk management indicator.

9. Conclusion

Sentiment-driven behavioral analytics offer strong predictive power for crypto trading. Emotional extremes reliably indicate reversal zones, and integrating sentiment with trading metrics enables smarter decision-making. With further refinement, these signals can support both automated and human trading workflows.

End of Report