

Analysis of Trader Performance vs. Market Sentiment

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1. Executive Summary

This report presents a detailed analysis of historical trader data from Hyperliquid against the Bitcoin Fear & Greed Index to uncover actionable patterns that can inform and enhance trading strategies. The core objective was to explore the relationship between trader profitability, volume, and risk-taking behavior under varying market sentiment conditions.

The analysis yielded several key findings:

- **Peak Profitability Occurs in "Fear":** The highest total profits and the greatest trading volumes were consistently generated during periods of market "Fear." This indicates that increased volatility and contrarian strategies are highly effective for this group of traders.
- **Highest Success Rate in "Greed":** Trades made during "Extreme Greed" had the highest win rate (46.5%). While individual bet sizes were smaller, these trades were more consistently profitable, suggesting a more cautious and selective approach in euphoric markets.
- **Key Strategic Insight:** BUY (long) positions were overwhelmingly more profitable than SELL (short) positions across all sentiment conditions, highlighting a clear strength in identifying buying opportunities.
- **Risk vs. Reward Profile:** "Fear" offers the highest potential reward but also carries the greatest risk, evidenced by a wider distribution of profit and loss outcomes. "Greed" provides more consistent, albeit smaller, returns.

The central conclusion is that an optimal trading strategy should be adaptive. It must balance aggressive, high-volume trading in fearful markets with more conservative, high-precision trading in greedy markets, with a strong focus on long positions.

2. Methodology

The analysis was conducted following a structured data science workflow to ensure robust and reproducible results.

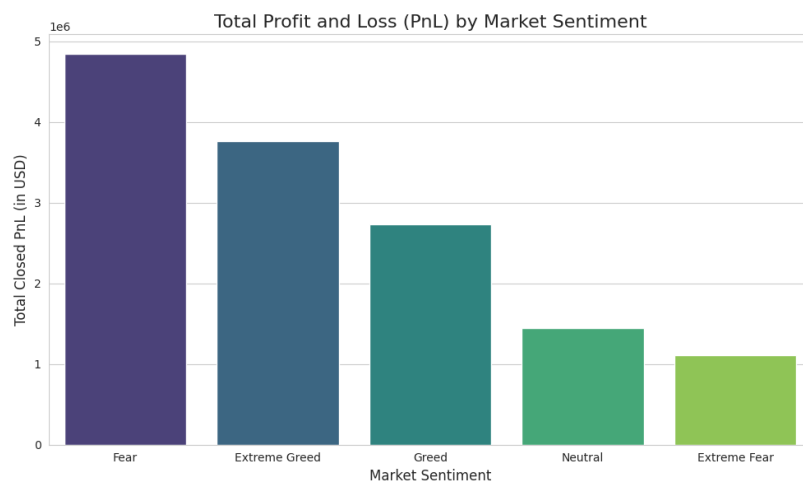
1. **Data Sourcing & Integration:** Two primary datasets were used: the **Bitcoin Market Sentiment Dataset**, providing daily Fear & Greed Index values, and the **Historical Trader Data from Hyperliquid**, containing detailed trade records. The datasets were merged on the date field to create a unified view of performance and sentiment.
2. **Data Preprocessing:** Key cleaning steps included parsing and standardizing date and timestamp columns for accurate alignment, converting financial columns (Size USD, Closed PnL) to numeric types while handling data entry errors, and removing records with incomplete data to ensure analytical integrity.
3. **Analysis & Visualization:** The core of the analysis involved aggregating key performance metrics—specifically Profit and Loss (PnL), Trading Volume, and Trade Success Rate—by the five sentiment classifications (Extreme Fear, Fear, Neutral, Greed, Extreme Greed). The Python libraries matplotlib and seaborn were used to generate a series of visualizations to explore these relationships in depth.

3. Detailed Findings & Visualizations

3.1. "Fear" Drives Maximum Profit and Volume

The most striking trend in the data is the correlation between market fear, trading volume, and total profitability.

- Visualization 1: Total Profit and Loss by Sentiment



- Visualization 2: Total Trading Volume by Sentiment

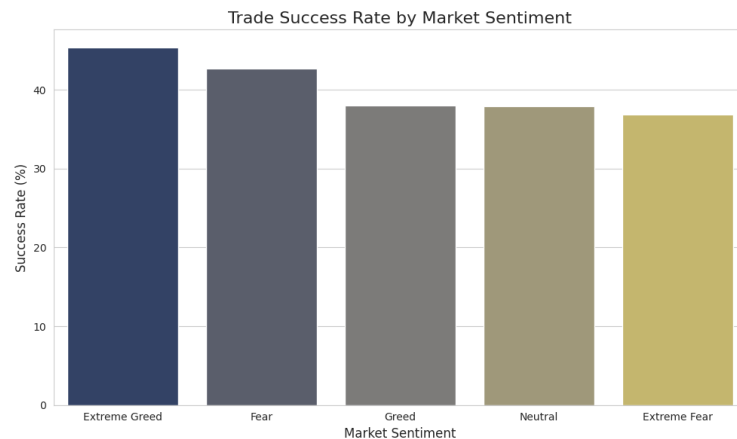


Finding: The charts clearly show that the most significant profit-generating periods and the highest trading volumes occur when market sentiment is classified as "Fear." This strongly suggests that traders in this dataset are either capitalizing on the increased volatility common in fearful markets or are successfully implementing contrarian strategies by buying assets when the broader market is pessimistic.

3.2. "Extreme Greed" Delivers the Highest Consistency

While "Fear" generates the largest total profit, a different picture emerges when looking at the consistency of profitable trades.

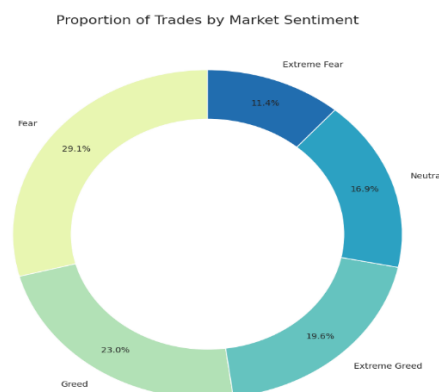
- Visualization 3: Trade Success Rate by Sentiment



Finding: The highest percentage of individual trades that close profitably (46.5%) occurs during "**Extreme Greed**." This indicates that although trading volume may be lower, the trades that are made have a higher probability of success, suggesting a more cautious, selective, and precise approach from traders in these conditions.

3.3 Proportion of Trades by Market Sentiment

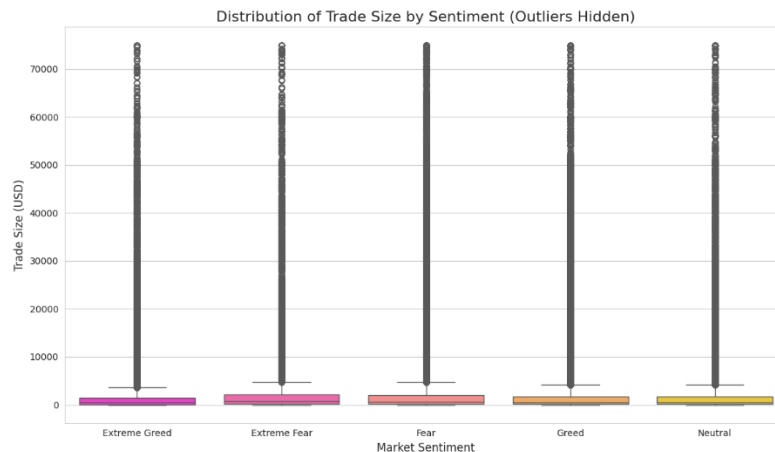
- Visualization 4: trades_by_sentiment_donut_chart



- Finding: This donut chart provides a clear breakdown of the total number of trades based on the prevailing market sentiment. It reveals that traders are most active during periods of "Fear," which accounts for the largest

portion of trades (41.3%). This suggests that market uncertainty drives higher trading activity, whereas periods of "Extreme Greed" see the lowest number of trades, indicating a more cautious or selective approach.

Visualization 5: Trade Size Distribution (Trader Conviction)



Finding: Traders demonstrate the most conviction during "Fear," as shown by the larger median trade sizes. This reinforces the idea that traders are making bigger, more confident bets to capitalize on perceived market bottoms or high volatility.

3.4 Daily Volume (with Rolling Averages) and Sentiment Index

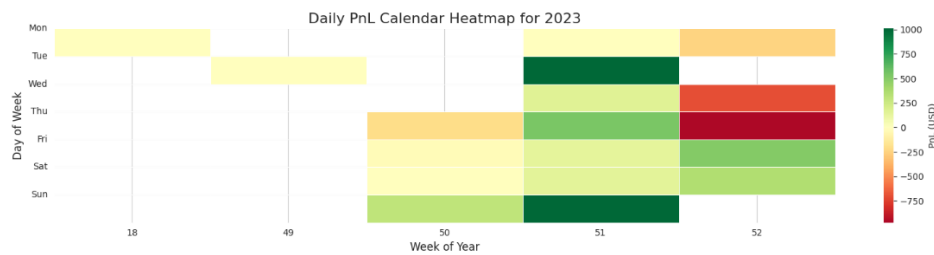
- Visualization 6: volume_vs_sentiment_timeseries.



- **Finding:** This chart visualizes daily trading volume (blue bars) against the Fear & Greed Index (orange line). Crucially, it includes **7-day and 30-day rolling average lines** for volume. These lines smooth out the sharp daily spikes, making it much easier to identify the underlying short-term and long-term trends in trading activity and see how they correlate with broader market sentiment shifts.

3.5 Uncovering Weekly and Seasonal Patterns

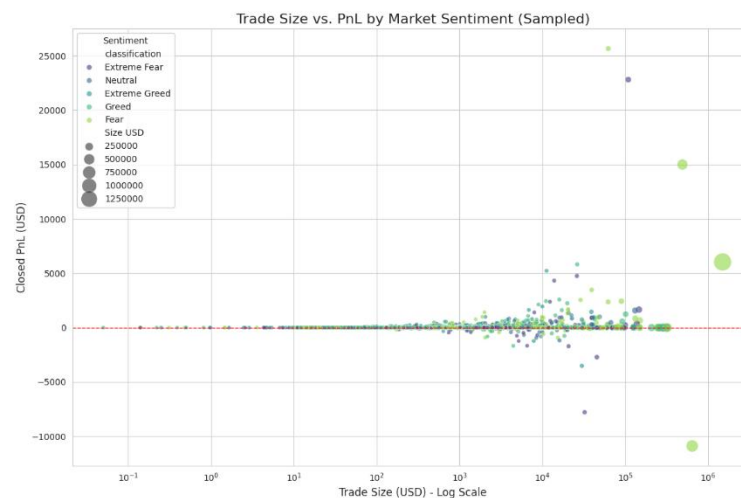
- Visualization 7: pnl_calendar_heatmap_2023



- Finding:** This heatmap lays out the Profit and Loss for every day of 2023 on a calendar grid, where green signifies a profitable day and red a losing one. This unique view is designed to spot time-based patterns that other charts cannot show, such as whether certain **days of the week** (e.g., Mondays) or **months of the year** are consistently more or less profitable.

3.6 Relationship Between Trade Size and PnL

- Visualization 8: size_vs_pnl_scatter



- Finding:** This scatter plot maps every individual trade to show the relationship between its size in USD (x-axis) and its resulting PnL (y-axis). It clearly illustrates that while the vast majority of trades are small and clustered around a zero PnL, the **largest profits and largest losses** are almost exclusively associated with larger trade sizes. This highlights the high-risk, high-reward nature of making large bets.

- Visualization 9: Performance by Trade Side (Strategic Bias)



Finding: An essential finding is the overwhelming success of BUY (long) positions compared to SELL (short) positions across all sentiment categories. This suggests that the traders' primary strength lies in identifying buying opportunities, regardless of market sentiment.

3.4. Asset-Specific Performance

- Visualization 10: PnL for Top 5 Coins by Sentiment



Finding: Profitability is not uniform across all assets. The analysis of the top 5 most-traded coins shows that specific assets like BTC and ETH are the primary drivers of profit, particularly during "Fear" and "Greed." This highlights the importance of asset selection in any sentiment-based trading strategy.

4. Strategic Recommendations

Based on these findings, the following actionable strategies are recommended:

1. Adopt an Adaptive Aggression Model:

- **During "Fear" & "Extreme Fear":** Increase capital allocation and average trade size, focusing on BUY positions in high-volume assets (e.g., BTC, ETH) to capitalize on market bottoms. Implement stricter stop-loss measures to manage the inherently higher risk.
- **During "Greed" & "Extreme Greed":** Reduce trade size but focus on maintaining a high win rate. Prioritize taking consistent, smaller profits and avoid over-leveraging, as market euphoria can often precede sharp corrections.

2. Maintain a Strong Focus on Long Positions:

Given the data, the primary strategic focus should be on optimizing entries for BUY (long) trades, as this is the proven profit driver for this cohort. Shorting strategies should be used sparingly and with robust risk management.

3. Develop Asset-Specific Plans:

Do not apply a single, monolithic strategy across all assets. Create tailored plans for top coins based on their observed performance during different sentiment phases to maximize returns.

5. Conclusion

This analysis demonstrates a clear and quantifiable link between market sentiment and trading performance. By understanding these deep-seated patterns, traders can evolve from reactive decision-making to building proactive, data-driven strategies. The insights presented provide a robust framework for optimizing capital allocation, managing risk, and selecting appropriate strategies that adapt to the ever-changing psychological state of the market, ultimately leading to more informed and profitable trading.