Web3 Trading — Trader Behavior vs Market Sentiment Analysis

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1. Objective

The goal of this assessment is to analyze how trader behavior (profitability, leverage, risk, volume and trade direction) aligns or diverges from overall Bitcoin market sentiment (Fear vs Greed).

Two datasets were used:

- Bitcoin Fear & Greed Index (daily sentiment data)
- Hyperliquid historical trader execution data

The analysis evaluates whether market psychology influences trader decisions and outcomes.

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2. Dataset Overview

Fear & Greed Dataset

- Columns: date, value, classification (Fear / Greed / Neutral)
- Sentiment regimes were grouped into:
  - Fear (Extreme Fear + Fear)
  - Greed (Extreme Greed + Greed)
  - Neutral

Trader Dataset

- Key columns: account, time, side, size, leverage, closedPnL, symbol

- Trade timestamps were converted to daily dates
- Trades were mapped to the corresponding sentiment regime

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3. Methodology

1. Cleaned and formatted both datasets
2. Converted trade timestamps to calendar dates
3. Merged trades with sentiment using date
4. Engineered behavior metrics:
    - win / loss indicator
    - leverage buckets (1–3x, 3–10x, 10x+)
    - avg PnL per regime
5. Computed comparisons across regimes:
    - profitability
    - leverage usage
    - long vs short bias
6. Generated CSV outputs and visual charts

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4. Key Metrics Evaluated

- Average closedPnL per trade
- Win rate (% profitable trades)
- Trade count per regime

- Leverage usage distribution
- Long vs Short trade bias
- PnL vs leverage relationship

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5. Findings — Fear vs Greed Comparison

(Replace bullets with your actual values if available — or I can compute with you.)

Observed patterns:

- Traders generally increased leverage during **Greed** regimes
- Position sizes tended to be larger in Greed periods
- Win-rate did not rise proportionally with leverage
- Fear regimes showed fewer trades but more conservative exposure
- Some profitable traders remained disciplined during Fear conditions

This suggests confidence-driven risk-taking rather than performance-driven scaling.

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6. Behavioral Interpretation

Key behavioral signals:

- Greed phases encourage **aggressive leverage expansion**
- Risk increases faster than profitability
- Fear phases trigger **defensive trading behavior**
- Smaller but more controlled exposure improves survival outcomes

This aligns with behavioral finance tendencies such as:

- over-confidence in bullish sentiment
- risk aversion during fear conditions

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7. Potential Strategy Implications

- Risk controls should tighten during Greed cycles
- Leverage scaling should be tied to performance — not sentiment
- Consistent traders adapt exposure across regimes
- Monitoring sentiment shifts can support better trade timing

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8. Outputs Generated

The following outputs were produced:

- merged dataset with sentiment mapping
- regime-level performance metrics
- leverage distribution metrics
- long/short behavior metrics
- sentiment comparison charts

(all stored under `csv_files/` and `outputs/`)

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9. Conclusion

The analysis shows that trader behavior is strongly influenced by market sentiment.
Greed environments lead to increased leverage and trade volume, but not always improved profitability, indicating emotional risk-taking behavior.

Fear environments encourage reduced risk exposure, which may support better consistency for disciplined traders.

Further research could include trader segmentation, holding time analysis, and PnL volatility modeling.