

Objective

This project investigates how trading behavior (profitability, risk, volume, leverage) aligns or diverges from market sentiment, as defined by the Bitcoin Fear & Greed Index. We aim to uncover patterns that can guide smarter trading strategies, especially during extreme sentiment conditions.

Datasets Used

1. Bitcoin Market Sentiment Dataset

- Columns: `date`, `classification` (Fear, Greed, etc.), `value` (index score)
- Source: Alternative.me Fear & Greed Index

2. Historical Trader Data from Hyperliquid

- Columns include: `account`, `symbol`, `execution price`, `size`, `side`, `start position`, `Closed PnL`, `leverage`, `time`, etc.
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Methodology

1. Data Preparation

- Cleaned and converted timestamp formats.
- Extracted trade date and merged both datasets on the `date` field to assign a sentiment label to each trade.

2. Feature Engineering

From the trader dataset, we derived:

- **Profitability:** Average and total `Closed PnL`

- **Risk Proxy:** Used **Crossed** column as a stand-in for leverage (real leverage column unavailable)
- **Trade Volume:** Total and average **Size USD** per sentiment group

3. Sentiment Classification Overview

Sentiment	Total Trades	Avg PnL	Total PnL	Avg Leverage*	Total Volume	Avg Trade Size
Fear	61,837	54.29	\$3.36M	0.60	\$483.3M	\$7,816
Greed	50,303	42.74	\$2.15M	0.61	\$288.6M	\$5,737
Extreme Greed	39,992	67.89	\$2.72M	0.62	\$124.5M	\$3,112
Neutral	37,686	34.31	\$1.29M	0.62	\$180.2M	\$4,783
Extreme Fear	21,400	34.54	\$739K	0.57	\$114.5M	\$5,350

*Used **Crossed** field as a proxy for leverage; actual leverage column was not available.

Visual Analysis

Total Profitability by Sentiment

Bar charts revealed:

- **Extreme Greed** periods had the **highest average profitability**, though total trades were lower.
- **Fear** periods yielded the **highest total PnL**, driven by higher volume and trade sizes.

Risk Behavior (Leverage)

- Leverage usage was marginally **higher in Greed/Extreme Greed** periods.

- **Extreme Fear** periods saw the **lowest leverage and PnL**, suggesting reduced risk appetite.
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Key Insights & Trends

1. **Fearful Markets Still Yield Profits**
Traders made **more total profit during Fear**, driven by higher volume—not necessarily better trade performance.
 2. **Greed Drives Smaller, Riskier Trades**
Average trade size drops during Greed, possibly indicating speculative short-term behavior.
 3. **Extreme Greed = High Efficiency**
Fewer trades, smaller sizes, but **highest average profit per trade**.
 4. **Extreme Fear = Reduced Confidence**
Smaller leverage and lower profitability, possibly from defensive strategies or reduced participation.
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Strategic Implications

- **Volume plays a larger role than sentiment** in total profits—monitoring liquidity and trade frequency may be more predictive.
 - **High average PnL in Extreme Greed** suggests strong bullish momentum—potential opportunities for short-term scalping.
 - Traders with consistent PnL in Fear periods may possess contrarian skill—identifying these traders could be valuable for signal extraction.
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Limitations & Next Steps

- Leverage used was approximated (Crossed) due to missing actual leverage column.
 - No differentiation by trader type, experience, or trading strategy.
 - Future work could include:
 - Time-series trend analysis
 - Clustering of trader behavior
 - Predictive modeling (e.g., classify winning trades from sentiment context)
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Conclusion

The study reveals a nuanced relationship between sentiment and trading behavior. While Fear dominates in volume and total profits, Extreme Greed outperforms in profit efficiency. Aligning strategy with sentiment can unlock smarter risk-adjusted opportunities—especially when sentiment diverges from market fundamentals.