Report:Trader Behavior Insights

1. Objective

Explore how trader profitability (ClosedPnL) relates to Bitcoin market sentiment (Fear/Greed Index) and uncover behavioral patterns that can inform trading strategies.

2. Data Overview

- **Sentiment dataset** → Daily values of Fear/Greed Index (classification, value).

- **Trader dataset** → Trade-level data from Hyperliquid (account, symbol, execution price, size, side, ClosedPnL, etc.).

- **Merged dataset** → Each trade tagged with daily sentiment classification and index value.

3. Market Sentiments Trends

- The **Fear–Greed Index** oscillates with market cycles.

- **Extreme Fear (<25)** often aligns with sharp market downturns → panic selling, higher volatility.

- **Extreme Greed (>75)** aligns with rallies → momentum chasing, overconfidence.

Behavioral Trend:

- Traders tend to make **riskier trades during Greed** periods.

- During Fear, they often close trades prematurely → locking small losses instead of waiting for recovery.

4. Profitability Insights

- **Overall Average PnL**: Slightly positive, but skewed — a few traders with big wins balance many small losses.

- **By Sentiment Class:**

    - **Greed → Higher Average PnL**

■ More trades ended positive.

■ Traders ride momentum trends.

○ **Fear → Lower Average PnL**

■ Higher loss probability.

■ Many trades closed in panic before recovery.

Behavioral Trend:

● **Overconfidence bias**: Traders do well in Greed but underestimate risks.

● **Loss aversion**: Fear leads to cutting trades too early.

5. Correlation Analysis

● **PnL vs Sentiment Value**: Positive correlation (traders profit more when sentiment is higher).

● **Per-Trader Correlation**:

○ Some traders consistently **profit more in Greed** (momentum traders).

○ Others show **contrarian patterns** — performing relatively better in Fear (possibly short sellers or risk-hedging strategies).

Behavioral Trend:

● Distinct archetypes of traders emerge:

○ **Momentum chasers** (profit when optimism is high).

○ **Contrarians** (benefit from downturns).

○ **Indifferent/losing traders** (underperform in all conditions).

6. Daily Trends

● **Line Plot (PnL vs Fear–Greed Index over time):**

○ When sentiment rises → daily average PnL also tends to rise.

○ Lags observed: traders sometimes react *after* sentiment shifts.

Behavioral Trend:

- **Herding effect**: Many traders enter positions late, after sentiment already shifted, reducing profits.

7. Trader Segmentation (Clustering Results)

Using KMeans clustering on average PnL in Fear vs Greed:

1. **Cluster A: Greed Specialists**

   ○ High profits in Greed, negative in Fear.

   ○ Momentum followers, vulnerable to downturns.

2. **Cluster B: Fear Survivors**

   ○ Manage smaller but steady profits during Fear.

   ○ Likely cautious traders or hedgers.

3. **Cluster C: Consistent Losers**

   ○ Negative PnL in both Fear and Greed.

   ○ Possibly inexperienced or using poor strategies.

4. **Cluster D: Balanced Traders**

   ○ Modest profits in both regimes.

   ○ Risk-managed, disciplined approach.

8. Behavioral Finance Insights

- **Greed fuels overtrading** → higher wins but also risk of blow-ups.

- **Fear leads to panic selling** → traders miss rebounds.

- **Herding**: Most traders follow the sentiment curve, rather than anticipating it.

- **Archetypes**: Not all traders are the same — segmenting them helps design better strategies.

Conclusion

The analysis shows that **market psychology (Fear vs Greed)** directly shapes trading behavior and profitability. Traders are not purely rational — they **mirror sentiment cycles**, with some adapting better than others. Recognizing these patterns could help improve trading systems, risk management, and even investor education.