Trader Behavior vs Market Sentiment – Data Science Report

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Objective

To explore how trader behavior (profitability, leverage, trading volume, and activity) aligns with or diverges from overall market sentiment (Fear vs. Greed).
 The goal is to uncover hidden patterns that can help design smarter trading strategies.

Data Preprocessing

- Converted timestamps to datetime and extracted **Date** for daily aggregation.
- Merged the two datasets on **Date** to align sentiment with trading activity.
- Computed daily metrics:
    - `Total Volume USD` (sum of trade size)
    - `Avg Closed PnL` (mean daily profit/loss)

Exploratory Data Analysis (EDA)

1. Trading Activity

- Average number of trades per day was higher during **Greed** periods.
- Boxplot showed a wider distribution of trades during **Fear**, indicating mixed trader reactions.

2. Profitability

- Average Closed PnL was **positive during Greed** and **negative during Fear**.
- Extreme Fear days showed higher loss variability — suggesting emotional trading.

3. Volume Trends

- Total trading volume was typically higher on **Greed** days, showing increased market participation.
- Some outliers indicated whale movements (large-volume trades) on certain Fear days.

4. Leverage Behavior

- Moderate leverage used on neutral/greedy days.
- Traders tended to **reduce leverage during Fear**, reflecting lower risk appetite.

Key Insights

1. **Market Sentiment strongly correlates with trading aggressiveness.**
   a. Greed → Higher trade count & volume.
   b. Fear → Lower leverage, cautious entries.
2. **Profitability aligns with sentiment.**
   a. Traders are more likely to be profitable in Greed phases.
3. **Fear phases create volatility opportunities** for contrarian traders (those betting against the crowd).
4. **Combining sentiment signals with trader metrics** (PnL, leverage, volume) could help predict profitable setups.

Conclusion

Market sentiment significantly influences trading behavior.
During Greed, traders are more active and profitable, whereas during Fear, they trade less but with higher emotional variance.
Integrating sentiment-based features into trading models could enhance predictive accuracy and risk management for algorithmic strategies.