

# TRADER SENTIMENT ANALYSIS

## Investigating the Correlation Between Market Sentiment & Performance

Date: October 2025

Source: Hyperliquid & Fear/Greed Index

### 1. Executive Summary

This report details an investigation into the relationship between market sentiment—specifically the Bitcoin Fear & Greed Index—and trader performance using historical trading data from Hyperliquid.

The primary objective was to determine if market sentiment acts as a reliable signal for trading profitability, volume, and behavior. By merging granular trading records with daily sentiment scores, we analyzed whether traders perform better during periods of "Fear" or "Greed" and how their activity levels shift in response to market emotions.

### 2. Data Sources & Methodology

#### Bitcoin Fear & Greed Index

- Metric:** Daily sentiment score (0-100)
- Classifications:** Extreme Fear, Fear, Neutral, Greed, Extreme Greed
- Source:** External API / Google Drive dump

#### Historical Trader Data

- Source:** Hyperliquid Trading Records
- Key Metrics:** Timestamp, Side (Buy/Sell), Size (USD), Closed PnL, Execution Price

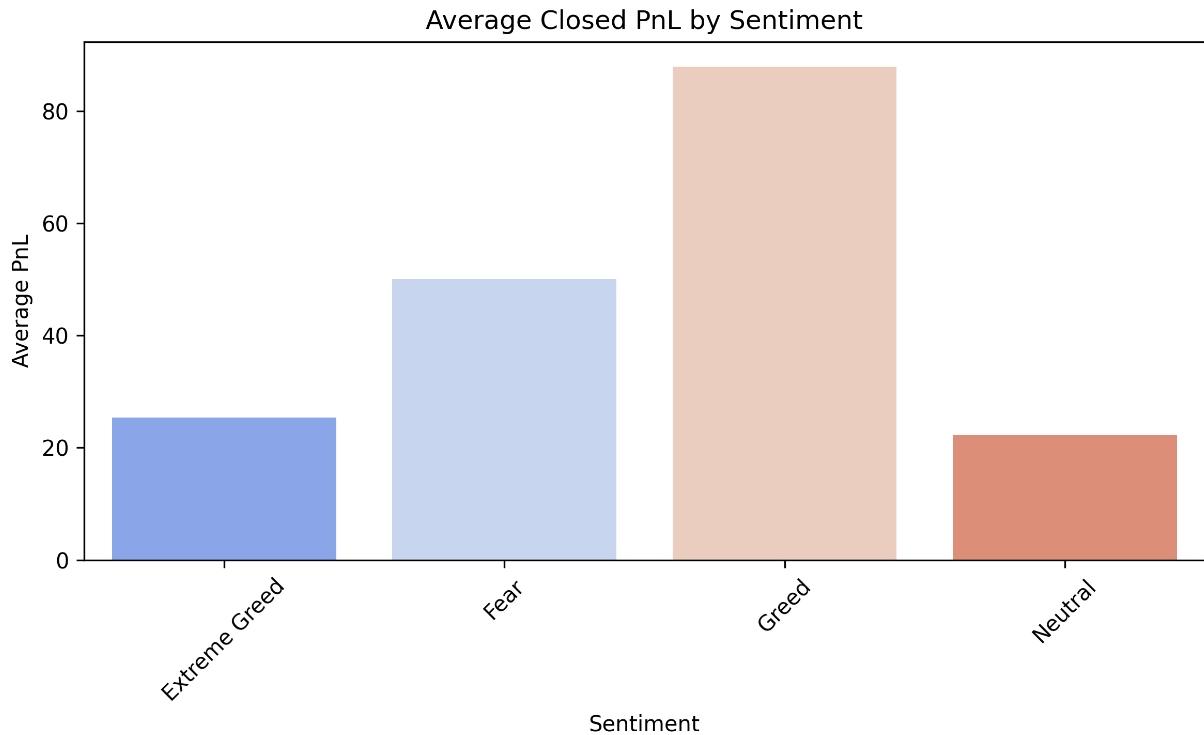
#### Methodology Pipeline:

- Data Preprocessing:** Conversion of Unix timestamps to datetime objects; removal of non-analytical columns (Transaction Hashes, Order IDs).
- Data Merging:** A *Left Join* operation aligned both datasets by date, attaching a specific market sentiment to every individual trade.
- Exploratory Data Analysis (EDA):** Aggregation of metrics (Mean PnL, Volume, Win Rates) grouped by sentiment classification.

### 3. Visual Insights & Findings

#### 3.1. Profitability by Sentiment

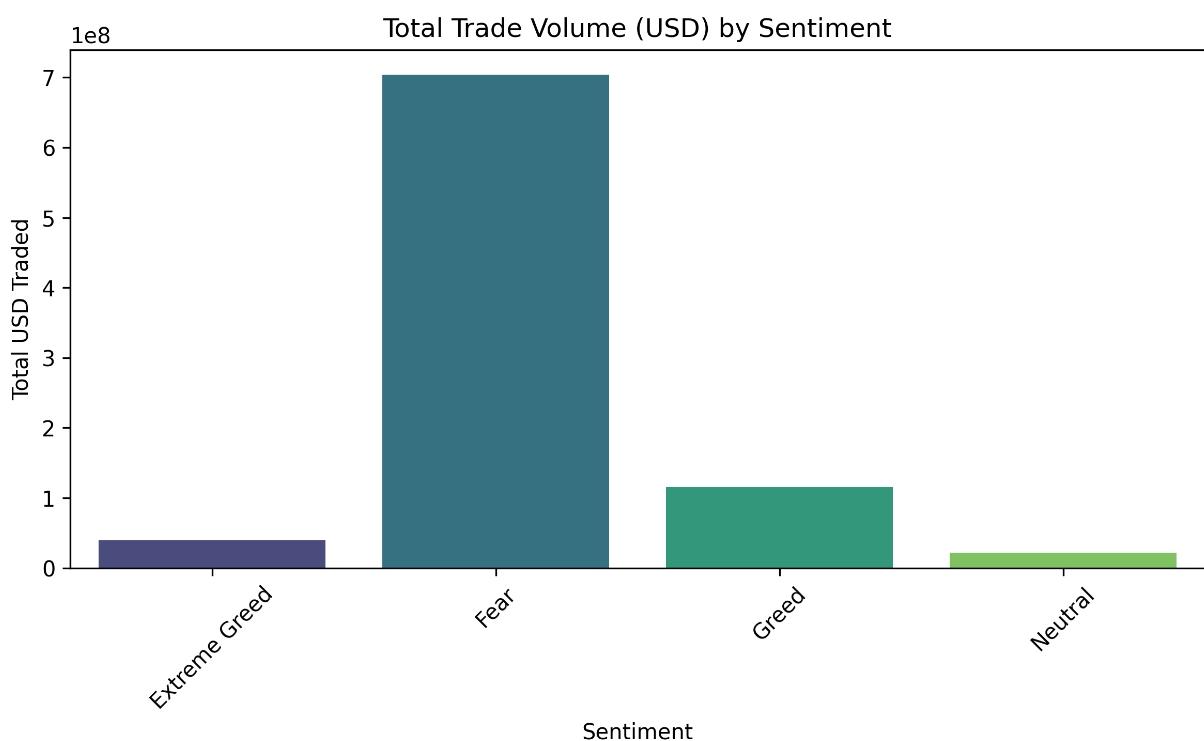
*Question: Are traders more profitable when the market is fearful or greedy?*



**Insight:** This analysis identifies the efficacy of "contrarian" vs. "momentum" strategies. The chart displays the average Closed PnL for trades executed under different sentiment categories, revealing which market emotional state yields the highest average return per trade.

### 3.2. Trading Volume & Activity

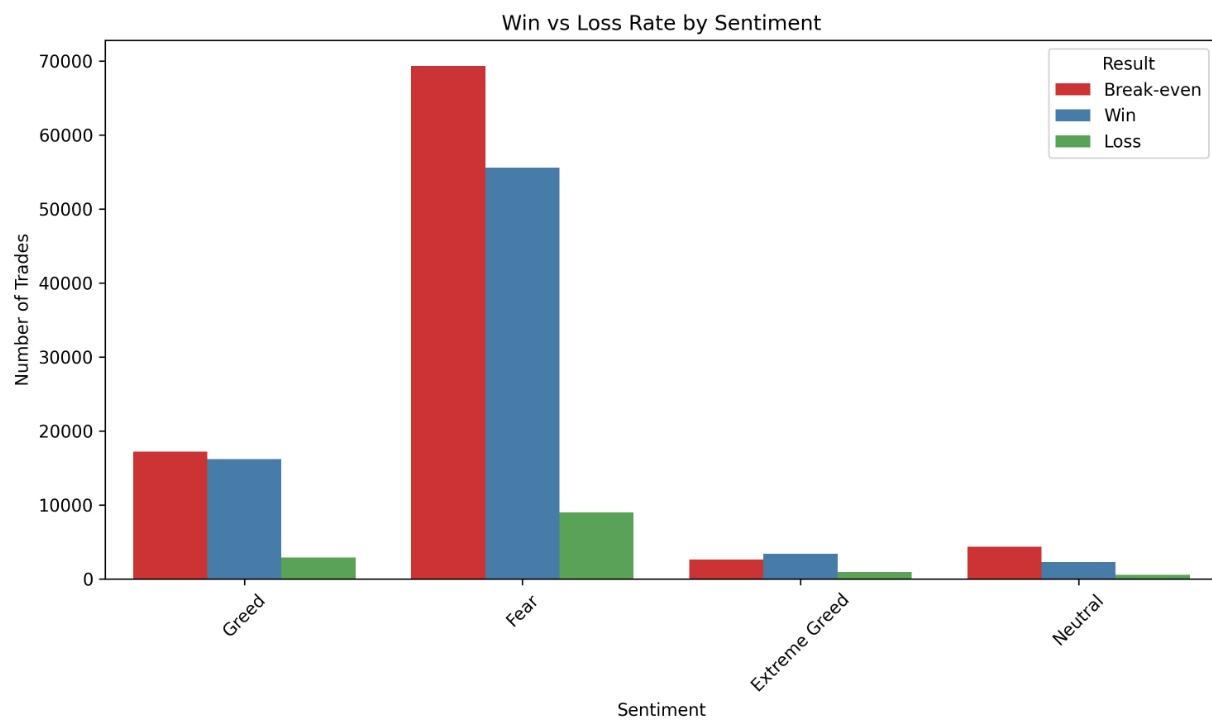
Question: When are traders most active?



**Insight:** High volume during "Extreme Greed" or "Extreme Fear" typically indicates emotional trading or high volatility periods that attract increased participation. This metric sums the total Size USD traded across categories.

### 3.3. Win vs. Loss Rate

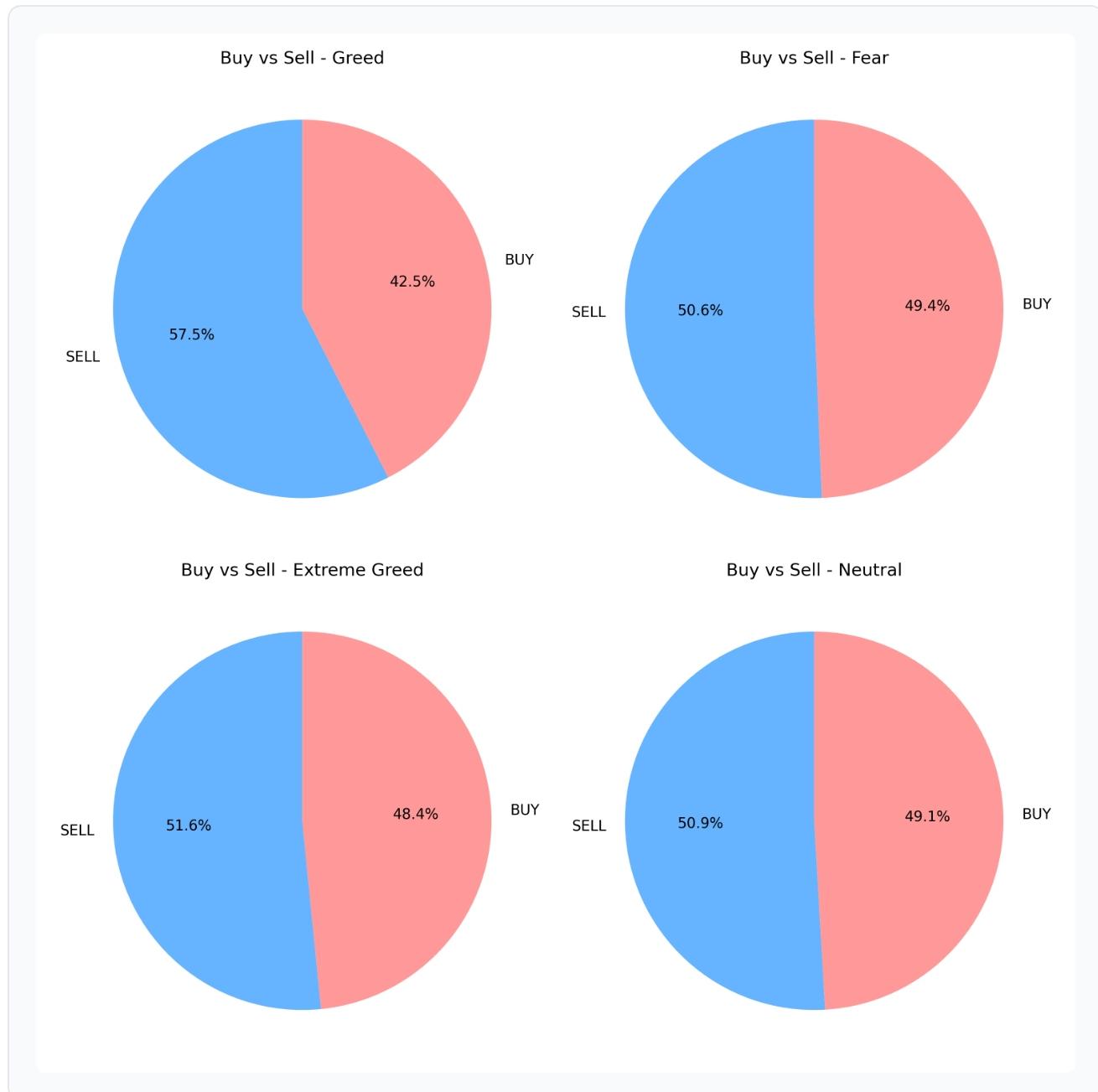
Question: How often do trades win in different market conditions?



**Insight:** This compares the count of profitable trades vs. losing trades. A high win rate in "Neutral" markets might suggest successful range-bound strategies, whereas "Extreme" conditions might correlate with higher volatility stop-outs.

### 3.4. Buy vs. Sell Behavior

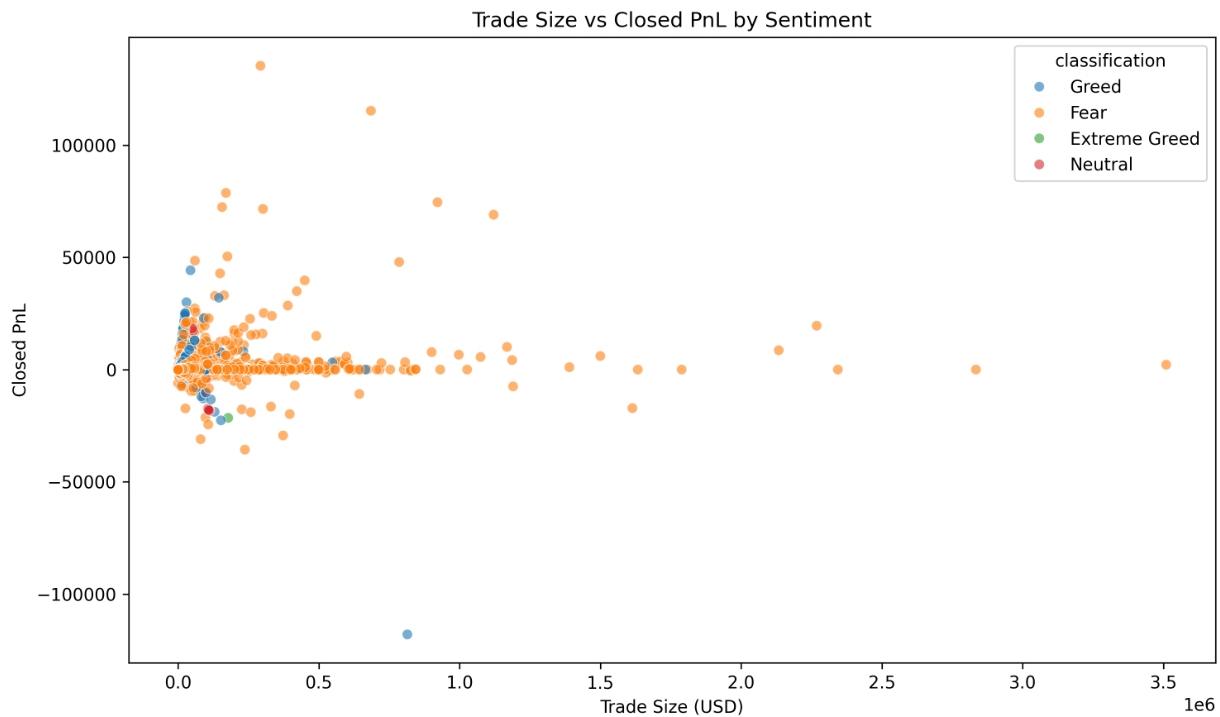
*Question: Do traders buy more or sell more during specific sentiments?*



**Insight:** This chart reveals trader bias. For instance, heavy buying during "Extreme Greed" suggests retail FOMO (Fear Of Missing Out), while heavy selling during "Fear" may indicate panic selling.

### 3.5. Trade Size vs. Profitability

Question: Is there a relationship between bet size and returns?



**Insight:** The scatter plot correlates trade size with realized PnL, color-coded by sentiment. It helps identify outliers—large bets that either paid off significantly or caused massive losses—and the market sentiment prevailing during those events.

## 4. Technical Implementation

The analysis was conducted using Python with the following core libraries:

```
pip install pandas matplotlib seaborn numpy
```

The project is structured into two main notebooks:

- `Notebook_0.ipynb`: Handles raw data loading and initial cleaning.
- `Notebook_1.ipynb`: Performs the merge logic, advanced analysis, and visualization generation.

