* I trained **two Binomial GLM models** to predict **email open rates**.
* The key difference:
  + **Model 1:** Included the Subject as a feature.
  + **Model 2:** Excluded the Subject from feature.

**📘 2. Model 1 — With “Subject” Feature**

* My goal was to Learns the **specific historical effect** of each subject line.
* Achieved **stronger predictive metrics:**
  + MAE = 0.0264
  + RMSE = 0.0355
  + R² = –0.3211
  + Pearson r = 0.4636
  + McFadden pseudo-R² = 0.815
* High pseudo-R² and correlation indicate **good in-sample accuracy**.
* However, it’s **not generalizable** — it “memorizes” known subjects.
* **New or unseen subjects** can’t be predicted effectively because the model hasn’t learned their coefficients.
* Best used for **retrospective analysis** or understanding which *existing* subjects perform well.

### 📊 Top 10 Most Important Features (by Absolute Coefficient Size)

| **Feature** | **Coefficient** | **Std\_Error** | **p\_value** | **Odds\_Ratio** |
| --- | --- | --- | --- | --- |
| **Subject\_Upp till -63% på favorit Väggdekorationer!** | **-0.5394** | **0.0030** | **<0.0001** | **0.583** |
| **Length\_Of\_subject\_short** | **-0.4373** | **0.0018** | **<0.0001** | **0.646** |
| **Price\_or\_Discount\_yes** | **-0.3526** | **0.0015** | **<0.0001** | **0.703** |
| **Urgency\_yes** | **-0.3448** | **0.0018** | **<0.0001** | **0.708** |
| **Subject\_Dekorativ inredning för hemmet till de bästa priset** | **0.3153** | **0.0038** | **<0.0001** | **1.371** |
| **Subject\_Upp till 58% rabatt på de mest älskade Canvastavlor! 🤩** | **-0.2882** | **0.0040** | **<0.0001** | **0.750** |
| **Subject\_Dina bilder på Canvastavla eller Fotopresenter från 49,50 kr** | **0.2778** | **0.0021** | **<0.0001** | **1.320** |
| **Day\_of\_week\_Sunday** | **-0.2538** | **0.0059** | **<0.0001** | **0.776** |
| **Subject\_2 dagar | Canvastavlor från endast 185 kr!** | **-0.2452** | **0.0038** | **<0.0001** | **0.783** |
| **Subject\_Hem och livsstil-produkter från 49 kr** | **-0.2361** | **0.0023** | **<0.0001** | **0.790** |

Top 10 Subjects That INCREASE Open Rate:

|  | **Subject** | **Coefficient** | **Odds\_Ratio** |
| --- | --- | --- | --- |
| 0 | Dekorativ inredning för hemmet till de bästa p... | 0.3153 | 1.371 |
| 1 | Dina bilder på Canvastavla eller Fotopresenter... | 0.2778 | 1.320 |
| 2 | WOW! Canvastavla 80x60cm för 189 kr | 0.2163 | 1.241 |
| 3 | Canvastavla 100x75cm för bara 199 kr | 0.1910 | 1.210 |
| 4 | Personlig väggdekoration till fantastiska priser! | 0.1728 | 1.189 |
| 5 | Otroligt ✨ 3 XXL-format för 249 kr styck | 0.1670 | 1.182 |
| 6 | Premiumtryck upp till 78% rabatt! | 0.1100 | 1.116 |
| 7 | Skynda dig! Väggdekor från endast 39kr! | 0.1009 | 1.106 |
| 8 | ✨ 3 Canvastavlor | 2 dagar | Upp till 54% rabatt! | 0.0454 | 1.046 |
| 9 | Skynda dig | -54% på XXL-Canvastavla! | 0.0008 | 1.001 |

**📙 3. Model 2 — Without “Subject” Feature**

* Forces the model to rely on **semantic and contextual predictors** like:
  + Tone, Personalization, Urgency, Length, Day of Week, etc.
* Achieved **lower accuracy:**
  + MAE = 0.0315
  + RMSE = 0.0452
  + R² = –1.1411
  + Pearson r = 0.1866
  + McFadden pseudo-R² = 0.6780
* But this model is **more robust and generalizable** for *new* campaigns.
* It predicts based on **patterns and writing features**, not memorized subjects.
  + I Used the Subject model for insight and validation.
  + Use the No-Subject model for deployment or new-subject scoring.