

# Application of Factor Analysis in Social Media

Using EmPower Research's Latent Perception Association Analysis

A White Paper by

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Whether you are new to Social Media or been around the virtual block a few times, chances are that you have heard the current buzzword ‘listening’. Social Media listening has strategic applications as it provides a great opportunity to learn at grassroots level about what people really think about your brand, product or services.

However, most organizations are skeptical about the power of Social Media in deriving consumer insights. They often restrict themselves to passive monitoring of conversations and stakeholder outreach.

EmPower Research shows how Factor Analysis can be applied to derive insights from unstructured Social Media data.

## Extracting relevant and insightful data from gigabytes of Social Media data

Market Research purists are hesitant to accept Social Media analytics as true statistical applications. The reason lays in the following.

- Difficulty in collating unstructured data and converting it into quantitative data
- Lack of standard methodologies
- And, more importantly selection of the right sample

In addition, the gigantic proportions of the Social Media data (90 trillion bytes and counting) and absence of tools for generating genuine consumer insights further complicate the matter. Most of the Social Media tools deal with 'basic level metrics' such as conversation volumes at various filter levels- Time period, geography, language, and some rudimentary demographics. However, identifying relationships among conversation themes have remained an unexplored area for a long time. For e.g., while we can currently obtain conversation volume on say 'price' as a feature, it is equally important to know whether that conversation is also associated with other features of the product.

This paper proposes an approach to applying a statistical technique to extract latent insights about conversation dynamics and tensions from Social Media data.

## EmPower Research's Latent Perception Association Methodology

Factor analysis is a statistical method used to describe variability among observed variables in terms of a potentially lower number of unobserved variables called factors.

In other words, it can determine the latent interrelationships in data. Traditional quantitative data analysts use this technique extensively and it can even have strong implications in interpreting Social Media data.

## Analysis Approach

EmPower Research conducted an independent study to understand consumer perceptions about a leading diaper brand. The data was collected across Social Media channels for a period of three months in the U.S. region.

The foremost step was quantifying the unstructured qualitative data. Various themes of conversations were identified through a proprietary methodology called the 2P. This methodology enables extraction and refinement of the patterns and perception within conversations, and development of themes/ variables. The data was aggregated for a stipulated time period in a quantified format by calculating the frequency of themes and weighing the themes by the strength of sentiment. This data was later converted to a ranked format based on the Likert scale principle and served as the raw data for Factor Analysis.

Figure 1 depicts a standard Share of Voice (SoV) analysis.

Conversation Volume was high for CSR and Absorbent Capacity. Strength of sentiment was measured based on the positive and negative mentions about the brand which was later converted to a Likert Scale. According to the strength of sentiment analysis "comfort" was very important and people did value CSR and Campaign initiatives of the brand.

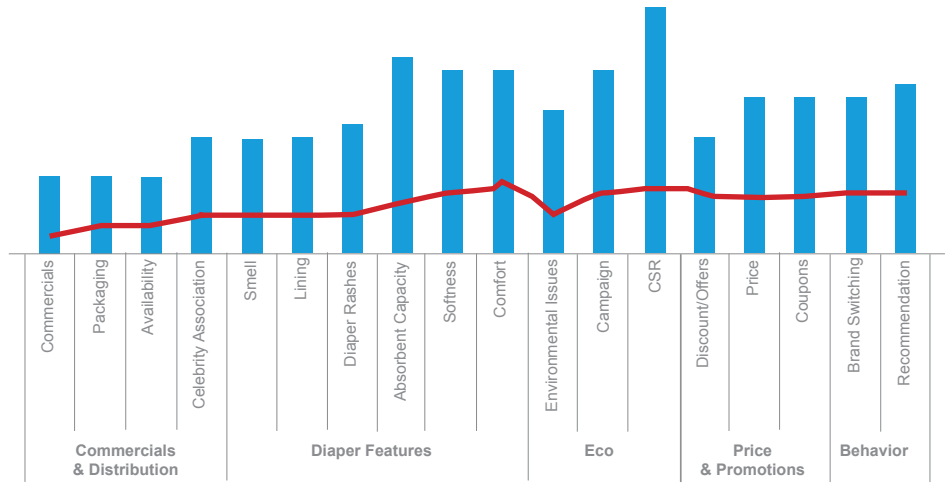


Figure 1: Share of Voice analysis

From the traditional SoV analysis, it can be concluded that the drivers of conversation volumes are **Comfort, Absorbent Capacity, Campaigns** and **CSR**. Also, it can be seen from the above analysis that the Strength of Sentiment is higher for **Discounts/Coupons**. Factor analysis on data related to diapers gives deeper insights by evaluating the strength of association among various themes. Factor analysis output not only depicts this but also shows how diaper features and price are related, or how commercials and behavior are related. Interestingly, it reveals good insights on the relation between **Smell** and **Comfort** – showing how closely those two features are related.

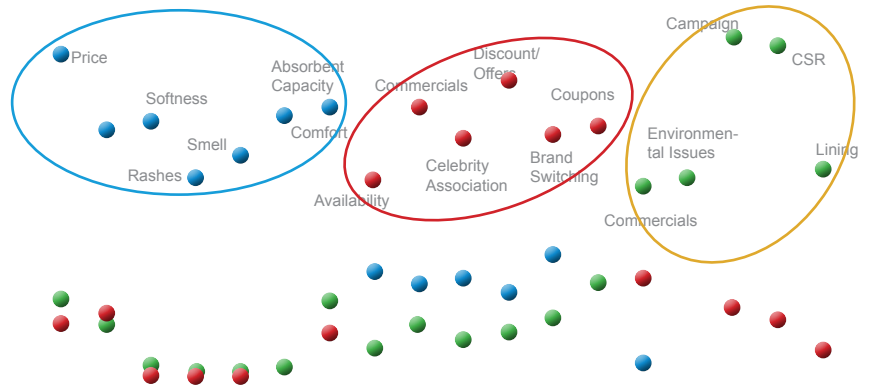


Figure 2: Factor Diagram

The main benefit of Factor Analysis (See *Table 1: Factor Analysis*) is that there can be unique core elements instead of redundant attributes. In this case of Diaper analysis, Factor 1 gives a key insight on how **Absorbent Capacity, Comfort** and **Smell** are closely associated and shows how these features drive **Recommendations**. Similarly Factor 2 shows how the promotional activities (brand's own and it competitor's) have an impact on **Brand Switching** and Factor 3 shows how the consumers associates the **CSR** and other Eco-friendly initiatives by the diaper brand and material used for lining. This study thus helped in unlocking hitherto hidden factors such as **Comfort** and **Smell**.

Theme	Factor 1	Factor 2	Factor 3
Price	0.864	0.045	0.046
Recommendation	0.611	-0.009	-0.050
Softnessz	0.649	-0.215	-0.185
Diaper Rashes	0.445	-0.272	-0.209
Smell	0.525	-0.272	-0.209
Comfort	0.669	-0.215	-0.185
Absorbent Capacity	0.691	-0.074	0.034
Availability	0.127	0.443	-0.118
Commercials	0.087	0.683	-0.045
Celebrity Association	0.117	0.583	-0.098
Discount/Offers	0.066	0.779	-0.066
Brand Switching	0.187	0.593	-0.018
Coupons	0.129	0.628	0.103
Packaging	0.234	0.112	0.422
Environmental Issues	0.070	-0.001	0.446
Campaign	0.032	0.003	0.922
CSR	0.040	-0.032	0.895
Lining	0.240	-0.132	0.475

Table 1: Factor Analysis

## Benefits

This methodology provides the benefit of applying proven statistical methods to generate actionable insights from Social Media content. It offers a new way for marketers to delve deeper into consumers' minds and to extract insights more effectively. This approach provides a holistic picture by blending both human and technological factors. In addition, it has the required statistical rigor to delight the purist market researchers!



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## About EmPower Research

EmPower Research is an integrated media and business research company. We help our clients understand their stakeholder perception and needs, empowering them to service better. We use proprietary methodologies to listen and learn about conversations in the customer ecosystem, deriving real insights for active stakeholder engagement.

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