

# Theory-driven Recommendations: Modeling Hedonic and Eudaimonic Movie Preferences

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**Abstract.** Most of the research in recommender systems focuses on data-driven approaches. In this paper we present our vision for complementing data-driven approaches with model-driven ones. We present a preliminary experimental set-up and we expose our research plan. In the experimental set-up we acquired eudaimonic characteristics of movies and user preferences. Furthermore, we performed a preliminary analysis of the acquired data.

**Keywords:** recommender systems · personality · hedonic emotions · eudaimonic emotions

## 1 Introduction

Mainstream research in recommender systems is data-driven. Logs of user behaviour, such as clicks, ratings, purchases, are used in a variety of algorithms, such as collaborative and feature-based approaches to generate recommendations [6]. In recent years we have worked on complementing these bottom-up, data-driven approaches with top-down, model-driven approaches to recommendations.

We view recommender systems as tools for helping users make better decisions [7]. Psychology research has shown that human decisions are influenced by diverse factors, among others by personality and emotions [3]. In our past work we focused mainly on these two models [8, 2, 10]. In this paper we present the preliminary results of introducing a known psychological model, that of *eudaimonia* in user modeling and recommender systems. The experience of consumption of an item (listening to a song, watching a movie) does not have only *hedonic* qualities (fun, enjoyment, relaxation) but also *eudaimonic* qualities, which are related to meaning and purpose [4].

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## 2 Eudaimonic Modeling and Related Work

We assume that users differ in their need for eudaimonic experiences, i.e. some people prefer to just have fun, while other people may prefer to spend their time contemplating meaning and purpose. Similarly, we observe that movies differ in the experience quality they induce. For example, the movies *The Hangover* and *La vita e' bella* are both comedies. But while the former is a shallow comedy with a series of simple jokes the latter deals with deeper issues, such as the holocaust.

In positive psychology, happiness is often described through two opposite concepts: hedonism and eudaimonism [1]: *the hedonic view equates happiness with pleasure, comfort, and enjoyment, whereas the eudaimonic view equates happiness with the human ability to pursue complex goals which are meaningful to the individual and society*. Oliver and Raney [5] have carried out research to identify whether there are distinct eudaimonic and hedonic motivations for consuming entertainment. Through a series of studies they devised an instrument for measuring the eudaimonic and hedonic qualities of entertainment experiences. They showed that *in addition to viewing movies for purposes of fun and pleasure, individuals also turn to entertainment for purposes of greater insight and meaningfulness*. Wirth et al. [11] further extended Oliver's work by analyzing what are the hedonic and eudaimonic qualities of movies with good and bad endings and found significant differences.

## 3 Work Plan

In order to devise personalization approaches using eudaimonia there are a lot of steps to make, since it is an unexplored area. We foresee the following steps need to be taken:

1. unobtrusive inference of eudaimonic and hedonic user preferences
2. automatic labeling of movies' eudaimonic and hedonic qualities
3. a personalized recommender system that takes advantage of eudaimonic and hedonic features

## 4 Data acquisition

We performed a user study to acquire data. We let the subjects choose movies from a pool of popular movies. For the hypothetical context of choosing a movie to watch alone on a Saturday evening, each subject had to choose the most appropriate movie (the *liked* movie) and the least appropriate movie (the *disliked* movie). The subjects were then asked to describe, for each of the two movies, their viewing experience in terms of hedonic and eudaimonic experience using an adaptation of the scale developed by [5]. After answering the movie-related questions, the subjects filled in the ten-items personality questionnaire (TIPI).

We hand-picked the movies in order to have a mix of hedonic and eudaimonic movies.

**Table 1.** Excerpt of movie titles used in the experiment. The eudaimonic and hedonic qualities are our subjective assessments

Title	Eudaimonic	Hedonic
Manchester by the sea	Y	N
Bad Moms	N	Y
Mad Max: Fury Road	N	Y
The Shawshank Redemption	Y	N
Inside Out	Y	Y

We ran the study through Amazon Mechanical Turk. After removing subjects who did not pass a control question and removing outliers using the Mahalanobis distance we had the answers of 84 subjects ( $M = 34.2$  years,  $SD = 9.5$  years, 29 females).

## 5 Results

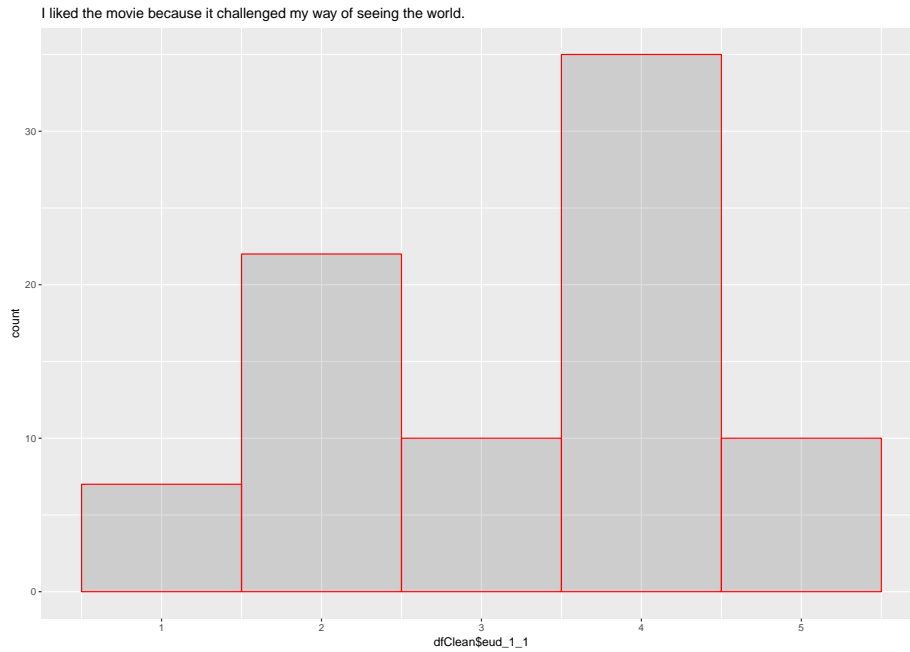
A deeper analysis of the data acquired is going to be presented at the UMAP 2018 conference [9]. Here we pick two specific aspects: (i) bimodal distribution of eudaimonic reasoning and (ii) movie characteristics.

Users divided themselves into two clusters in terms of the eudaimonic qualities of the liked movies (see Fig. 1): some users liked movies with high eudaimonic qualities (scores  $> 3$ ) while some users liked movies with low eudaimonic qualities (scores  $< 3$ ), which is reflected in the bimodal shape of the histogram in Fig. 1. We conjecture that this bi-modal shape is due to user being either pleasure-seekers or meaning-seekers.

We clustered the movies into three categories: hedonic-only, eudaimonic-only and mixed. We performed the Wilcoxon rank sum test in order to test the hypothesis of the mean reported hedonic and eudaimonic quality being equal. Examples from all three clusters are reported in Tab. 2.

**Table 2.** Examples from clusters of movies. The left column shows movies that have a stronger eudaimonic quality, the right column shows movies with a stronger hedonic quality and the mid column shows movies that are equally hedonic and eudaimonic

Eudaimonic	Mixed	Hedonic
Arrival	La La Land	Deadpool
Passengers	Hidden Figures	Mad Max: Fury Road
The Girl on the Train		Bad Moms
Fifty Shades of Gray		



**Fig. 1.** Distribution of eudaimonic qualities of liked movies. The variable reported in this figure is the agreement with the statement *I liked this movie because it challenged my way of seeing the world.*

## 6 Future Work

The results of our study indicate that eudaimonic characteristics are useful for accounting variance in user preferences and for characterizing movies.

We plan to proceed with the three steps: (i) unobtrusive inference of eudaimonic/hedonic preferences, (ii) automatic labeling of movies and (iii) personalized recommendations of movies.

For the unobtrusive inference we are designing an experiment. In addition to the variables acquired in the experiment reported above, we will collect also the users' social media data. We plan to ask for Facebook likes, twitter activity and Instagram activity. Using features extracted from social media activity we plan to do a predictor of the user preferences for movies in the hedonic/eudaimonic space. The recent scandal with Facebook data integrity may pose a further problem in devising such a method.

For the automatic labeling of movies we plan to use movie subtitles for feature generation. We foresee the usage of NLP techniques and generate features using TF-IDF and embeddings. In order to get ground truth movie labels we plan to crowd-source the labeling of a pool of movies.

For the personalized recommendation part we plan to use content-based recommendation methods that take advantage of the eudaimonic and hedonic features.

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