## Nudging Towards Health in a Conversational Food Recommender System Using Multi-Modal Interactions and Nutrition Labels

Media



Rainbow Pasta Salad I 45

Thank you for providing 5 preferences!

But I also propose to you a healthier

The first dish I proposed contains

less fats than the first one

 less salt than the first one What do you think about my

Thanks you for using this bot! 15:

recommendations?

I reccomend these pasta dishes because I

ingredients that you might like: mozzarella cheese, linguine pasta, tomato, basil, garlic

less saturated fats than the first one

alternative: Lisa's Lasagne

Giovanni Castiglia, Ayoub El Majjodi, Federica Calò, Yashar Deldjoo, Fedelucio Narducci, Alain Starke, Christoph Trattner

## Background

The majority of existing conversational recommender systems (CRSs) rely solely on natural language or basic click-based interactions. The goal of this project is to compare the impact of three usersystem interaction and explanation modalities (textual, multi-modal, and multi-modal with nutritional labels) on both behavioral aspects (what type of recipe is chosen? How healthy is that recipe?) and evaluation aspects (how does the user evaluate the system or their chosen recipe?

## Proposed Solution

Multi-modal conversational food recommender system, with three modalities as shown in figure 1:

- → Pure textual
- → Multi-modal (text plus visuals)
- → Multi-modal supplemented with nutritional labelling

## Results

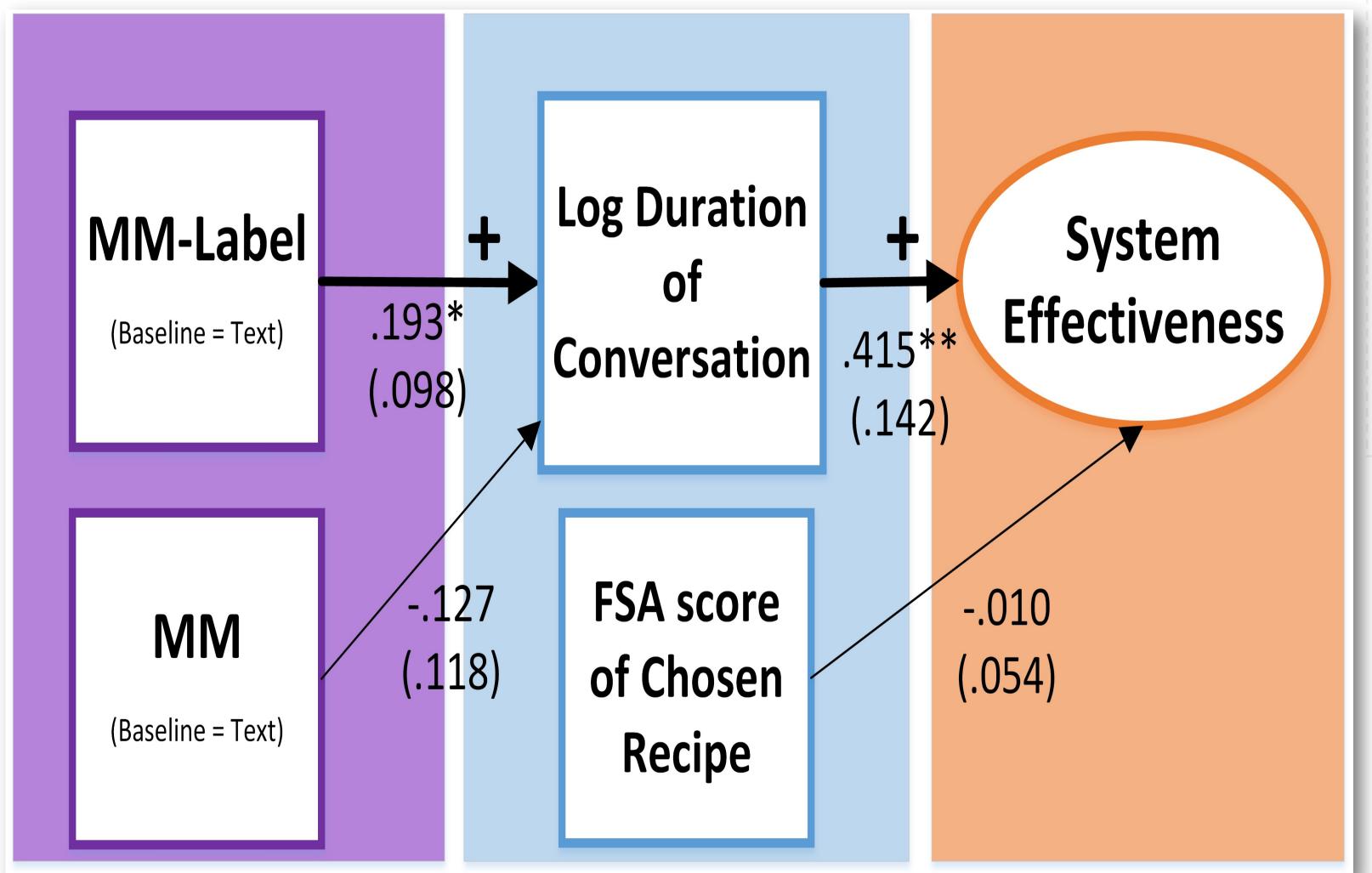
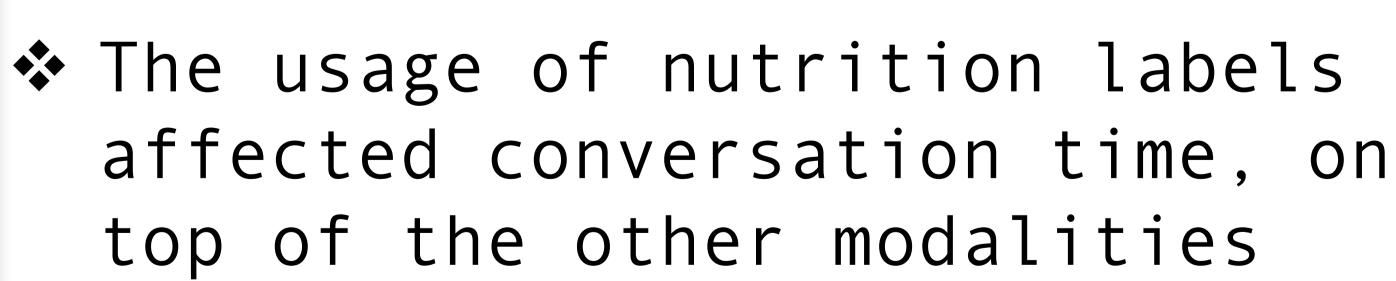


Figure 2: Structural Equation Model (SEM). Numbers on the arrows represent theβ-coefficients, standard errors are denoted between brackets. Effects between the subjective constructs are standardized and can be considered as correlations, other effects show regression coefficients. Aspects are grouped by color: Objective system aspects are purple, behavioral indicators are blue (note: the FSA score represents recipe unhealthiness) and experience aspects are orange. The thinner arrows are non-significant relations, in addition:\*\*\*p < 0.001, \*\*p < 0.05.

users who interacted with the chatbot for longer periods of time indicated greater levels of system effectiveness

What can this bot do? This chatbot is part of the research of Giovanni Castiglia and Federica Calò from Politecnico di Bari (Italy) with the cooperation of Media Futures and University of Bergen (Norway). The chatbot recommends healthy recipes to But I also propose to you a healthier I will hold a conversation with you to identify Multi-Modal (MM) the best dish for you. Note: send /cancel to stop talking to me Select a category of food you would like to · less calories (185 Kcal) than the first one less sugars than the first one less salt than the first one Pasta 🍝 Salad 🚳 Thank you for providing 5 preferences! Dessert 👑 Snack 👸 Multi-Modal + Labels (MM-Label) Figure 1: system modalities

Textual (T)





the Research Council of Norway (grant number 309339).

