

# Supplementary Materials: Learning to Classify Human Needs of Events from Category Descriptions

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## A Details about Experiments and Hyperparameters

We did manual greedy search to tune the hyperparameters (i.e., the learning rate  $\alpha$ , the number of None events  $K$ , and the number of sampling times  $T$ ) for reinforced concept selection method. It only took 9 trials to find the best hyperparameters. For each experiment run, it took around 10 hours to finish 200 epochs of reinforced concept selection on a regular desktop computer.

## B Human Needs Category Descriptions

The following are the human needs category descriptions used in this work.

### Physiological Needs

The need for a person to breathe pleasant or beneficial air and to avoid unpleasant air.

The need for a person to obtain food, to have good meals, to avoid unpleasant food.

The need for a person to avoid thirst, to avoid unpleasant beverages, and to drink or obtain pleasant beverages.

The need for a person to sleep regularly, and comfortably.

The need for a person to maintain warmth of the human body, to not be too hot or too cold.

The need for a person to obtain shelter and to avoid unpleasant shelters.

### Health Needs

The need for a person to be healthy and to avoid having any disease or symptom.

The need for a person to receive treatment or medication when having health problems.

The need for a person to do exercise and to stay fit.

### Leisure Needs

The need for a person to enjoy entertainment or to have entertainment activities.

The need for a person to have leisure activities and to avoid too much work.

The need for a person to have an enjoyable and pleasant environment.

The need for a person to appreciate art, music, and the beauty of nature etc.

### Social Needs

The need for a person to have family, to have close family relationships, and to avoid damaging family relations.

The need for a person to have friends and to have friendships.

The need for a person to interact with another person, to maintain pleasant social relations with others, to avoid conflicts and arguments with others.

The need for a person to maintain socially and culturally acceptable behavior.

The need for a person to realize and improve one's self-worth, or to be recognized by other persons.

The need for a person to maintain and improve self-esteem or dignity.

### Finance

The need for a person to earn money and to obtain other financial income.

The need for a person to reduce financial costs and other expenses.

The need for a person to acquire valuables and to protect one's belongings.

The need for a person to be employed and to have a pleasant job.

### Cognition

The need for a person to obtain skills, information, knowledge, and understanding.

The need for a person to improve one's intelligence.

The need for a person to remember and to mentally process information correctly.

### Emotion

The event directly describes experiencers' sentiments, emotions, feelings, or physical expressions of emotions.

The event expresses some opinions about some objects.

## C Concepts for Human Need Categories

### C.1 All Automatically Extracted Concepts

The following are all the extracted concepts from human needs category descriptions.

**Physiological Needs:** meal, person, warm color, food, person, person, shelter, air pollutant, physiological characteristic, warm color, air pollutant, person, food, beverage, shelter.

**Health Needs:** exercise, person, symptom, treatment, exercise, noncommunicable disease, medication, health service, person, treatment, medication, person

**Leisure Needs:** entertainment, person, leisure activity, art, person, beauty service, beauty service, person, music, person, entertainment, environment, work, music, leisure activity, person, environment, person, art

**Social Needs:** friend, person, argument, relation, family, person, behavior, person, person, self help group, self help group, relationship, behavior, person, respect, social group, conflict, respect, friend, person, person, family

**Finance Needs:** money, expense, valuable, job, cost, clothes, person, valuable, money, person, cost, person, expense, person, income

**Cognition Needs:** information, person, artificial intelligence technique, knowledge, cognitive function, skill, information, person, skill, artificial intelligence technique, person, knowledge, person

**Emotion:** expression, feeling, advice, mental state, mood, event, emotion, sentiment words

### C.2 Manually Generated Concepts

The following are the manually generated concepts based on category descriptions.

**Physiological Needs:** food, drink, meal

**Health Needs:** medication, symptom, physical problem, ailment, health problem, medical condition

**Leisure Needs:** entertainment, leisure activity, leisure, recreational activity, activity, sport, occasion, art, tourist attraction, attraction

**Social Needs:** person person, family member

**Finance Needs:** valuable, finance, financial cost

**Cognition Needs:** cognitive function, mental process

**Emotion:** emotion, facial expression, sentiment words

### C.3 Selected Concepts by Our Method

The following are an example of concepts selected by our method.

**Physiological Needs:** meal, food, beverage

**Health Needs:** exercise person, symptom, treatment, exercise, medication, person treatment, medication, person

**Leisure Needs:** leisure activity, entertainment, environment, music

**Social Needs:** friend person, argument, relation, family person, behavior person, person self help group, self help group, relationship, behavior, social group, friend, person person

**Finance Needs:** valuable, job, clothes, income

**Cognition Needs:** information person, artificial intelligence technique, knowledge, cognitive function, skill, information, person skill, artificial intelligence technique person, knowledge person

**Emotion:** feeling, advice, mental state, mood, event, emotion, sentiment words