NormBank:
A Knowledge Bank of Situational Social Norms

https://github.com/SALT-NLP/normbank

Caleb Ziems  Jane Dwivedi-Yu  Yi-Chia Yang  Alon Y. Halevy  Diyi Yang

@cjziems  @JaneDwivedi  @Meta  @Meta  @Diyi_Yang
Motivating NormBank

**Goal:** teach NLP systems to reason about situationally-grounded social norms

1. **Commonsense**
   - ConceptNet
   - ARC EASY
   - Physical IQa
   - What is the mustache made of?

2. **Social Commonsense**
   - intent
   - persona
   - causes
   - effects
   - reaction
   - effect

3. **Moral Reasoning**

4. **Situational Commonsense**

**Motivating, Structuring, Building, Using, and Expanding NormBank**

Hovy & Yang [NAACL 21]
Motivating NormBank

“Spit”
- It's gross

Spitting is generally considered impolite and unhygienic in many cultures and situations.
Motivating NormBank

“a person spits on an airplane”
- *It's disgusting*

No, it is **not okay** to spit on an **airplane**. Spitting on an airplane, or any enclosed public space for that matter, is considered highly inappropriate and unsanitary.
Spitting at a rodeo or any public event is generally considered inappropriate behavior. Rodeos are public gatherings where people come to enjoy the event and watch the performances. Spitting in such an environment can be seen as disrespectful to both the performers and the spectators.
Motivating NormBank

Delphi speculates:

This statement may contain unintended offensive content. Reader discretion is strongly advised. Please be mindful before sharing.

“a person spits at the **dentist's office**”

- **It's disgusting**

No, it is **not considered appropriate to spit at the dentist's office** or any healthcare facility. Dentists' offices are professional environments where hygiene and cleanliness are crucial. Spitting can spread germs and create an unsanitary condition.
Motivating, Structuring, Building, Using, and Expanding NormBank
Goffman’s (1959) Dramaturgical Model of Social Life

SCENE: Structuring NormBank
Goffman’s (1959) **Dramaturgical Model** of Social Life

Motivating, **Structuring**, Building, Using, and Expanding **NormBank**
Motivating, Structuring, Building, Using, and Expanding NormBank
Motivating, Structuring, Building, Using, and Expanding NormBank
Motivating, Structuring, Building, Using, and Expanding NormBank

Roles

- customer
- server
Motivating, Structuring, Building, Using, and Expanding NormBank
Behaviors

- drinking alcohol
- going on a date

Motivating, Structuring, Building, Using, and Expanding NormBank
Motivating, Structuring, Building, Using, and Expanding NormBank
129 Settings
airplane, amusement park, bank, bar, cemetery, classroom, …
404 Constraints

country,
physical conditions,
special observances,
time

Afghanistan, Albania, Algeria, Andorra, Angola, Argentina
cleanliness, lighting, temperature, weather
holidays, special events
day of the week, season, time of day, time period
Motivating, **Structuring**, Building, Using, and Expanding **NormBank**
Motivating, Structuring, Building, Using, and Expanding **NormBank**

- **Setting**
- **Environment**
- **Roles**
- **Attributes**
- **Behaviors**

**578 Attributes**
- age, characteristic, condition, diet, gender, education, employment, marital-status, medical-condition, race, religion, sexuality, social class
Motivating, **Structuring**, Building, Using, and Expanding **NormBank**
Motivating, Structuring, Building, Using, and Expanding NormBank
Building NormBank
SETTING: dentist’s office

BEHAVIOR: ask for a toothbrush

Motivating, Structuring, Building, Using, and Expanding NormBank
\[ S \quad \text{SETTING: dentist's office} \]

\[ B \quad \text{BEHAVIOR: ask for a toothbrush} \]

→ norm: *expected* ✓

→ norm: *okay* ☁

→ norm: *unexpected* ✗
\( S \) \hspace{1cm} \text{SETTING: dentist's office}

\( B \) \hspace{1cm} \text{BEHAVIOR: ask for a toothbrush}

\[ \rightarrow \text{norm: expected} \]
Setting: dentist’s office

Behavior: ask for a toothbrush

→ norm: expected

Person’s attribute: child

Motivating, Structuring, Building, Using, and Expanding NormBank
**S** SETTING: dentist’s office

**B** BEHAVIOR: ask for a toothbrush

→ *norm: expected* ✓

PERSON's attribute: child

PERSON's role: patient

Motivating, Structuring, **Building**, Using, and Expanding **NormBank**
PERSON’s role: patient

OTHER’s role: dentist

PERSON’s attribute: child

→ norm: expected

SETTING: dentist’s office

BEHAVIOR: ask for a toothbrush

Motivating, Structuring, Building, Using, and Expanding NormBank
**SETTING:** dentist’s office

**BEHAVIOR:** ask for a toothbrush

---

- **PERSON’s role:** patient
- **OTHER’s role:** dentist
- **PERSON’s attribute:** child
- **PERSON’s behavior:** about to leave

---

Add a New “Expected” Table (OR)

- **PERSON’s role:** dental hygienist
- **OTHER’s role:** dental assistant
- **PERSON’s behavior:** brush a patient’s teeth

---

Motivating, Structuring, **Building**, Using, and Expanding **NormBank**
**S** SETTING: dentist’s office

**B** BEHAVIOR: ask for a toothbrush

→ **norm: okay**
- PERSON’s role: patient
- OTHER’s role: dental hygienist

→ **norm: expected**
- PERSON’s role: patient
- OTHER’s role: dentist
- PERSON’s attribute: child
- PERSON’s behavior: about to leave

Add a New “Expected” Table (OR)

- PERSON’s role: dental hygienist
- OTHER’s role: dental assistant
- PERSON’s behavior: brush someone’s teeth

Motivating, Structuring, Building, Using, and Expanding NormBank
**S** SETTING: dentist’s office

**B** BEHAVIOR: ask for a toothbrush

**→ norm: expected**
- PERSON's role: patient
- OTHER's role: dentist
- PERSON's attribute: child
- PERSON's behavior: about to leave

**→ norm: okay**
- PERSON's role: patient
- OTHER's role: dental hygienist

**→ norm: unexpected**
- PERSON's role: receptionist

**Add a New “Expected” Table (OR)**
- PERSON's role: dental hygienist
- OTHER's role: dental assistant
- PERSON's behavior: brush someone's teeth

---

Motivating, Structuring, **Building**, Using, and Expanding NormBank
Motivating, Structuring, **Building**, Using, and Expanding **NormBank**
Annotation statistics
Motivating, Structuring, Building, Using, and Expanding NormBank
Behaviors: 6,938
Settings: 129

Annotation statistics
Motivating, Structuring, **Building**, Using, and Expanding NormBank
Behaviors: 6,938
Settings: 129
Distinct Norms: 155,423

Annotation statistics
Motivating, Structuring, Building, Using, and Expanding NormBank
Behaviors: 6,938
Settings: 129
Distinct Constraints: 408,407
Distinct Norms: 155,423

Annotation statistics
Motivating, Structuring, Building, Using, and Expanding NormBank
Using NormBank

Motivating, Structuring, Building, Using, and Expanding NormBank
Use Cases

1. Knowledge Bank
2. Seed for NLP Tasks
3. Ground for Social Commonsense Knowledge Transfer
Use Cases

1. Knowledge Bank
2. Seed for NLP Tasks
3. Ground for Social Commonsense Knowledge Transfer
Use Cases

1. Knowledge Bank
2. Seed for NLP Tasks
3. Ground for Social Commonsense Knowledge Transfer
Use Cases

1. **Knowledge Bank**
2. **Seed** for NLP Tasks
3. **Ground** for Social Commonsense Knowledge Transfer

Motivating, Structuring, Building, **Using**, and Expanding **NormBank**
Throwaway for obvious reasons. I dropped out of uni 2 years ago because I was planning on moving to a different country...Yesterday I heard [my dad] choke, he was struggling to breathe and honestly, it sounded like he was gonna die. And I was relieved. My first instinct wasn't to help him, instead I kept doing my skincare, honestly hoping he'd just die already. He didn't. I told my mum what happened when she got home and she thinks I'm a monster. But am I really? This person has abused me my entire life, has beaten the living shit out of me, hell he has even tried to kill me a few times. I know my life would get better if he died, my mum would sell our apartment and I'd finally have money to go to college and start my own life. So AITA for wanting my abusive father gone?

Label: Who is in the wrong?

Input Text: Throwaway for obvious reasons. I dropped out of uni 2 years ago because I was planning on moving to a different country...Yesterday I heard [my dad] choke, he was struggling to breathe and honestly, it sounded like he was gonna die. And I was relieved. My first instinct wasn't to help him, instead I kept doing my skincare, honestly hoping he'd just die already. He didn't. I told my mum what happened when she got home and she thinks I'm a monster. But am I really? This person has abused me my entire life, has beaten the living shit out of me, hell he has even tried to kill me a few times. I know my life would get better if he died, my mum would sell our apartment and I'd finally have money to go to college and start my own life. So AITA for wanting my abusive father gone?

Label: *Who is in the wrong?*

Throwaway for obvious reasons. I dropped out of uni 2 years ago because I was planning on moving to a different country…Yesterday I heard [my dad] choke, he was struggling to breathe and honestly, it sounded like he was gonna die. And I was relieved. My first instinct wasn't to help him, instead I kept doing my skincare, honestly hoping he'd just die already. He didn't. I told my mum what happened when she got home and she thinks I'm a monster. But am I really? This person has abused me my entire life, has beaten the living shit out of me, hell he has even tried to kill me a few times. I know my life would get better if he died, my mum would sell our apartment and I'd finally have money to go to college and start my own life. So AITA for wanting my abusive father gone?

Label: *Who is in the wrong?*


Motivating, Structuring, Building, *Using*, and Expanding *NormBank*
### Transfer

<table>
<thead>
<tr>
<th>SCRUPLES DILEMMAS</th>
<th>Base</th>
<th>+ NormBank</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANECDOTES</td>
<td>68.3%</td>
<td>68.7% ★</td>
</tr>
<tr>
<td>DILEMMAS</td>
<td>64.3%</td>
<td>71.1% ★</td>
</tr>
</tbody>
</table>

★ Significant improvements over base

- Motivating,
- Structuring,
- Building, **Using**, and Expanding **NormBank**
### Transfer

<table>
<thead>
<tr>
<th>C</th>
<th>OS</th>
<th>M</th>
<th>O</th>
<th>S</th>
<th>Q</th>
<th>A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>+ NormBank</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANECDOTES</td>
<td>68.3%</td>
<td>68.7% ★</td>
</tr>
<tr>
<td>DILEMMAS</td>
<td>64.3%</td>
<td>71.1% ★</td>
</tr>
<tr>
<td>CosmosQA</td>
<td>59.8%</td>
<td>61.2%</td>
</tr>
</tbody>
</table>

Motivating, Structuring, Building, **Using**, and Expanding **NormBank**
Motivating, Structuring, Building, **Using**, and Expanding **NormBank**
Expanding NormBank

Motivating, Structuring, Building, Using, and Expanding NormBank
Knowledge Expansion Methods

1. Classification

*Considerations:*
- Massive constraint space
- Assumes a “closed world”
Knowledge Expansion Methods

1. Classification
   Considerations:
   - Massive constraint space
   - Assumes a “closed world”

2. Generation

Motivating, Structuring, Building, Using, and Expanding NormBank
Knowledge Expansion Methods

1. **Classification**
   
   *Considerations:*
   
   - Massive constraint space
   - Assumes a “closed world”

2. **Generation**

   \[
   X = \begin{array}{ccccccc}
   s_1 & s_2 & \ldots & s_K & [\text{BEH}] & b_1 & \ldots & b_L & [\text{norm}] & r & [\text{cons}] & \ldots
   \end{array}
   \]

   fill in the blank

Motivating, Structuring, Building, Using, and **Expanding NormBank**
## Knowledge Expansion Methods - Generation Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensible Norm</th>
<th>Correct Norm</th>
<th>Normative Constraint</th>
<th>Helpful Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max</td>
<td>100.%</td>
<td>100.%</td>
<td>100.%</td>
<td>100.%</td>
</tr>
</tbody>
</table>

Motivating, Structuring, Building, Using, and **Expanding NormBank**
<table>
<thead>
<tr>
<th>Model</th>
<th>Sensible Norm</th>
<th>Correct Norm</th>
<th>Normative Constraint</th>
<th>Helpful Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human</td>
<td>82.5%</td>
<td>55.0%</td>
<td>72.9%</td>
<td>81.7%</td>
</tr>
<tr>
<td>Max</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Knowledge Expansion Methods - Generation Results

Motivating, Structuring, Building, Using, and Expanding NormBank
Knowledge Expansion Methods - **Generation Results**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensible Norm</th>
<th>Correct Norm</th>
<th>Normative Constraint</th>
<th>Helpful Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>BART</td>
<td>100.%</td>
<td>46.0%</td>
<td>94.3%</td>
<td>94.3%</td>
</tr>
<tr>
<td>Human</td>
<td>82.5%</td>
<td>55.0%</td>
<td>72.9%</td>
<td>81.7%</td>
</tr>
<tr>
<td>Max</td>
<td>100.%</td>
<td>100.%</td>
<td>100.%</td>
<td>100.%</td>
</tr>
</tbody>
</table>

Motivating, Structuring, Building, Using, and **Expanding NormBank**
## Knowledge Expansion Methods - Generation Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensible Norm</th>
<th>Correct Norm</th>
<th>Normative Constraint</th>
<th>Helpful Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPT-3</td>
<td>95.0%</td>
<td>61.1%</td>
<td>91.8%</td>
<td>87.8%</td>
</tr>
<tr>
<td>BART</td>
<td>100.%</td>
<td>46.0%</td>
<td>94.3%</td>
<td>94.3%</td>
</tr>
<tr>
<td>Human</td>
<td>82.5%</td>
<td>55.0%</td>
<td>72.9%</td>
<td>81.7%</td>
</tr>
<tr>
<td>Max</td>
<td>100.%</td>
<td>100.%</td>
<td>100.%</td>
<td>100.%</td>
</tr>
</tbody>
</table>
Conclusion

PERSON’s behavior: drinking hot coffee

(setting: athletic field)

→ norm: okay

PERSON’s role: spectator

→ norm: unexpected

PERSON’s role: athlete

→ norm: unexpected

environment: hot

“One of the most trenchant contributions to social psychology in this generation.” —American Journal of Sociology
NormBank: A Knowledge Bank of Situational Social Norms

https://github.com/SALT-NLP/normbank

Caleb Ziems  Jane Dwivedi-Yu  Yi-Chia Yang  Alon Y. Halevy  Diyi Yang

@cjziems  @JaneDwivedi  @Meta  @Meta  @Diyi_Yang