

NormBank:

A Knowledge Bank of Situational Social Norms

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

Caleb Ziems



@cjziems

Jane Dwivedi-Yu



@JaneDwivedi

Yi-Chia Yang



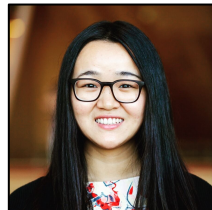
@Meta

Alon Y. Halevy



@Meta

Diyi Yang



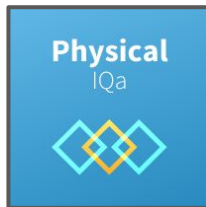
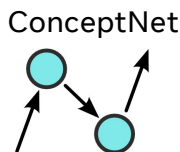
@Diyi_Yang



Motivating NormBank

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

1. Commonsense

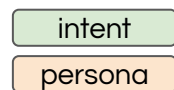


V
Q
A



The Importance of Modeling Social Factors of Language

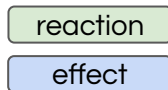
2. *Social* Commonsense



causes

EVENT

effects



COMET



Cosmos QA

Social IQa

3. *Moral* Reasoning



MIC



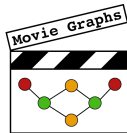
Social Chemistry 101



4. *Situational* Commonsense



VISUAL COMMONSENSE REASONING



[Hovy & Yang \[NAACL 21\]](#)

Motivating, Structuring, Building, Using, and Expanding NormBank

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*



v1.0.4



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.



Motivating NormBank

“a person spits at the rodeo”

- *It's disgusting*



v1.0.4



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*



v1.0.4



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





Age



Setting



Role



**Food
Behavior**



Holiday



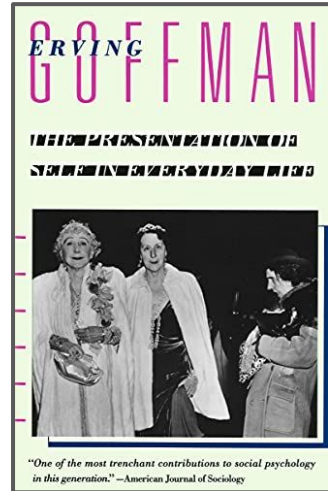


Goffman's (1959) **Dramaturgical Model** of Social Life

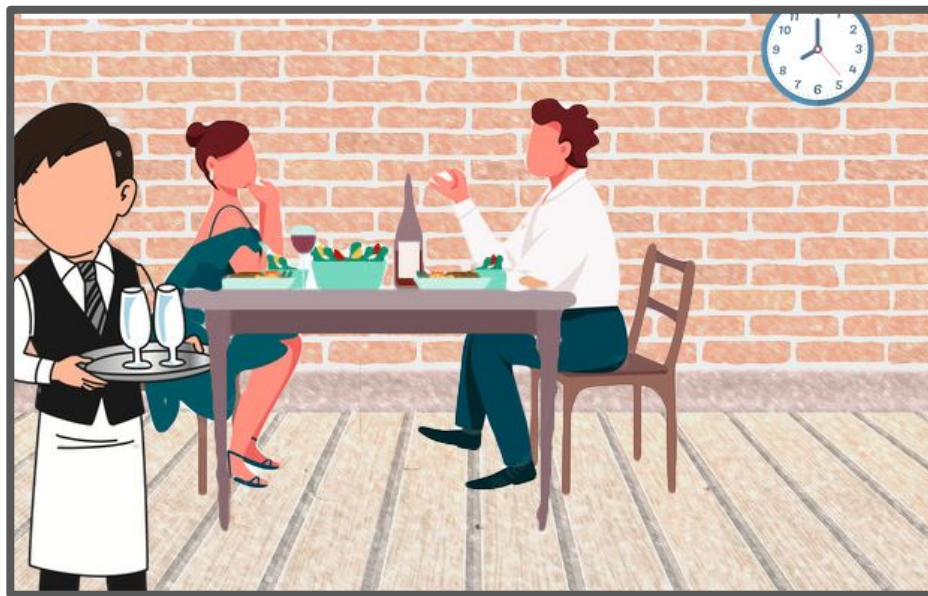
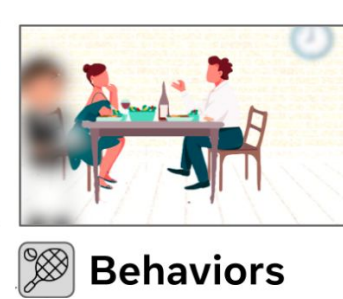
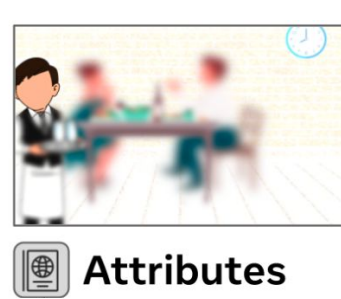
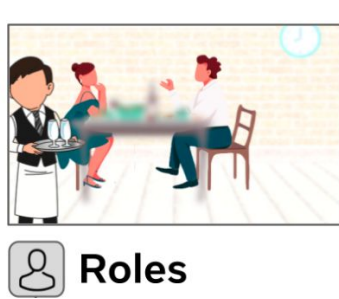
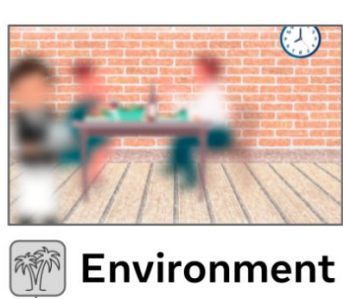
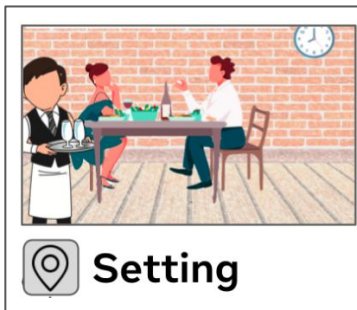
SCENE: Structuring NormBank



Goffman's (1959) **Dramaturgical Model** of Social Life



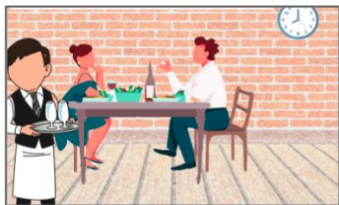
Motivating, **Structuring**, Building, Using, and Expanding NormBank



Setting



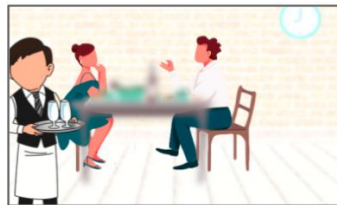
restaurant



 **Setting**



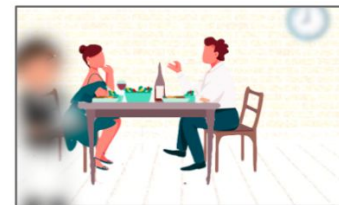
 **Environment**



 **Roles**



 **Attributes**



 **Behaviors**



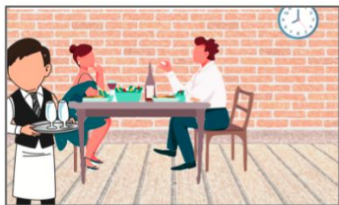
Environment



night



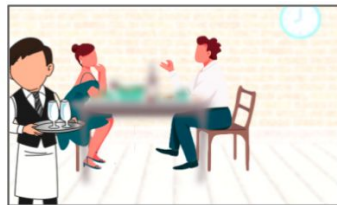
not crowded



 **Setting**



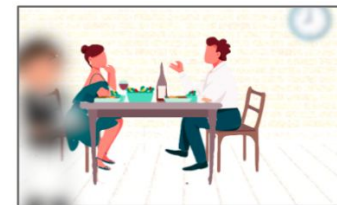
 **Environment**



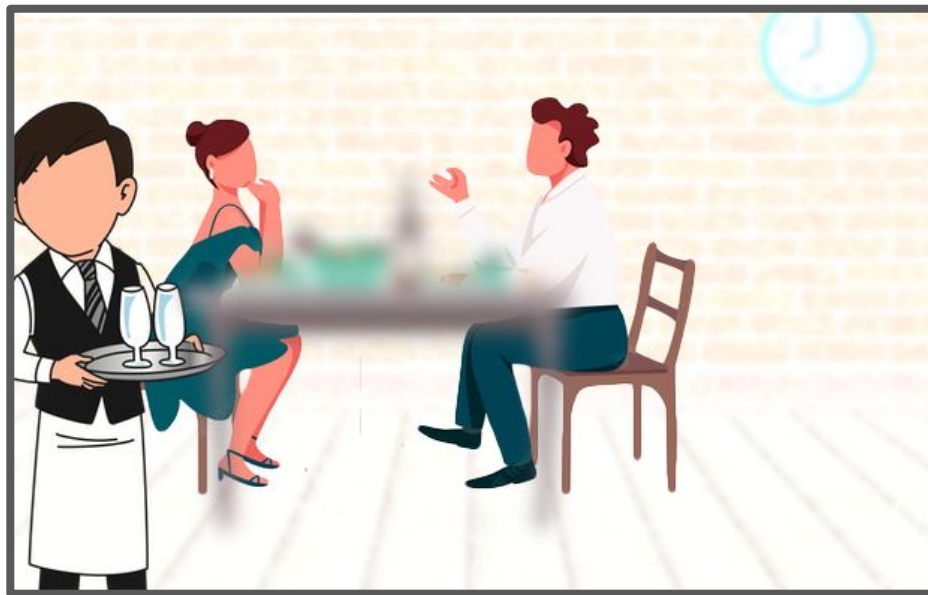
 **Roles**



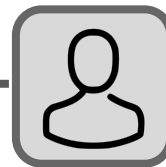
 **Attributes**



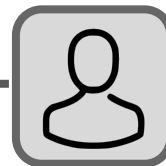
 **Behaviors**



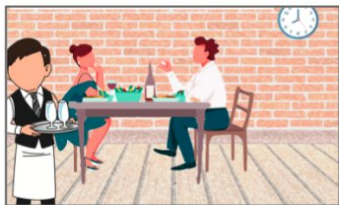
Roles



customer



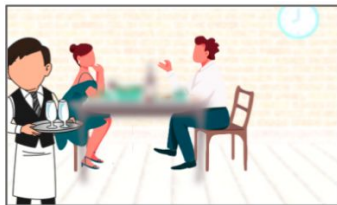
server



 **Setting**



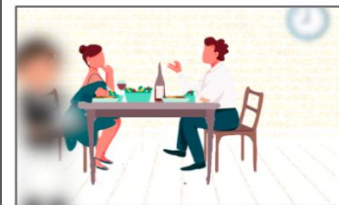
 **Environment**



 **Roles**



 **Attributes**



 **Behaviors**



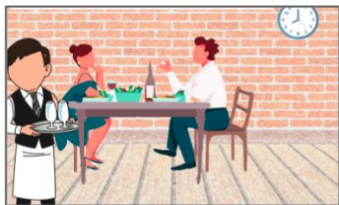
Attributes



adult



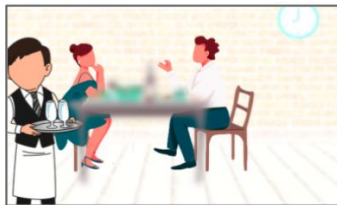
man



 **Setting**



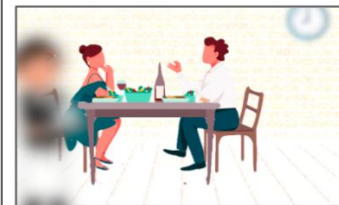
 **Environment**



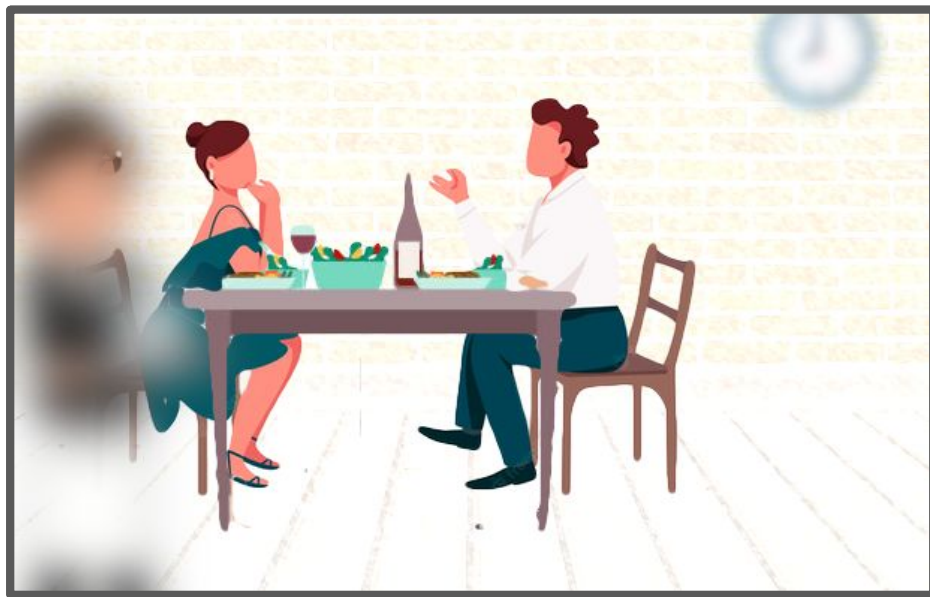
 **Roles**



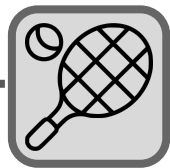
 **Attributes**



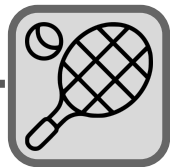
 **Behaviors**



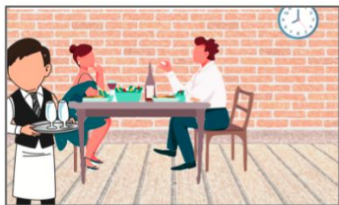
Behaviors



drinking alcohol



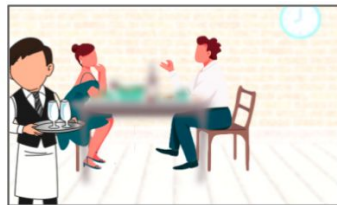
going on a date



 **Setting**



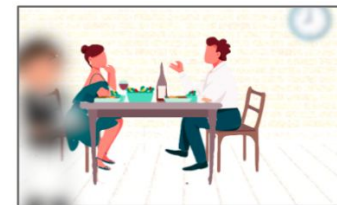
 **Environment**



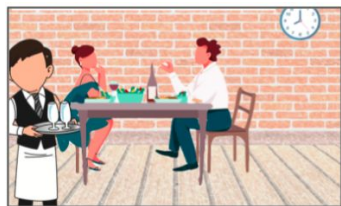
 **Roles**



 **Attributes**



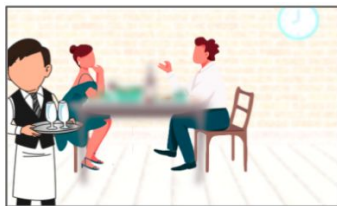
 **Behaviors**



 **Setting**



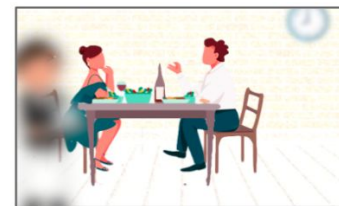
 **Environment**



 **Roles**



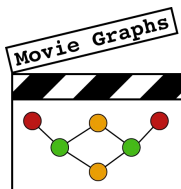
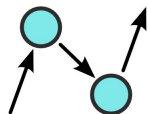
 **Attributes**



 **Behaviors**



ConceptNet



129 Settings

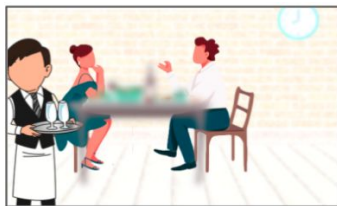
airplane, **amusement park**, bank, **bar**, cemetery, **classroom**, ...



 **Setting**



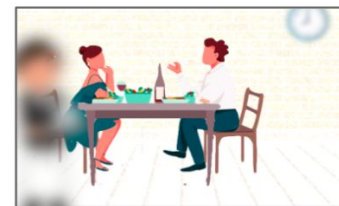
 **Environment**



 **Roles**



 **Attributes**



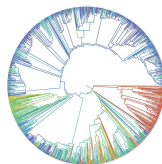
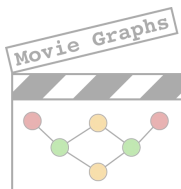
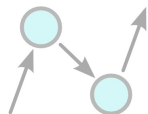
 **Behaviors**



ConceptNet



Taxonomy



404 Constraints

country,
physical conditions,
special observances,
time

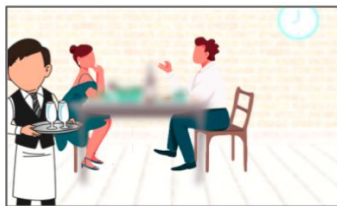
Afghanistan, **Albania**, Algeria, **Andorra**, Angola, **Argentina**
cleanliness, lighting, **temperature**, weather
holidays, **special events**
day of the week, season, **time of day**, time period



 **Setting**



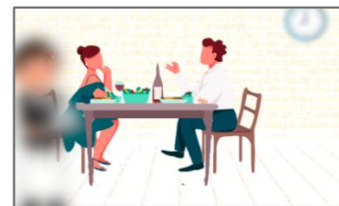
 **Environment**



 **Roles**



 **Attributes**



 **Behaviors**



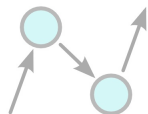
ConceptNet



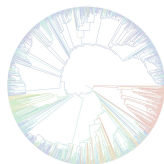
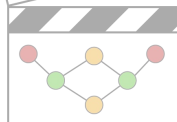
Taxonomy



OpenAI GPT-3

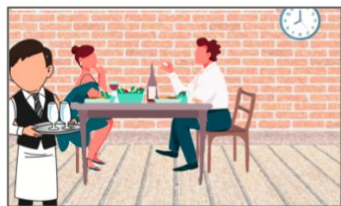


Movie Graphs



928 Roles

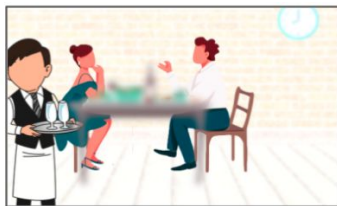
Motivating, **Structuring**, Building, Using, and Expanding NormBank



 **Setting**



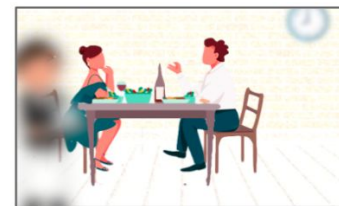
 **Environment**



 **Roles**



 **Attributes**



 **Behaviors**



ConceptNet



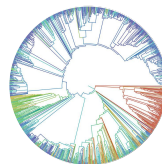
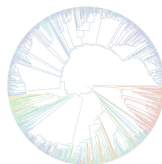
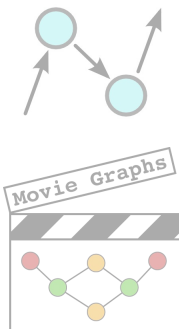
Taxonomy



OpenAI GPT-3

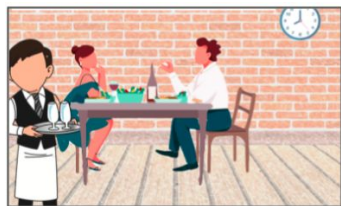


Taxonomy



578 Attributes

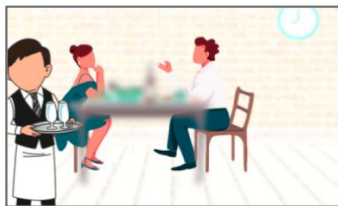
age, **characteristic**, condition, **diet**,
gender, **education**, employment,
marital-status, medical-condition,
race, religion, **sexuality**, social class



 **Setting**



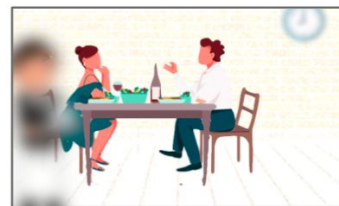
 **Environment**



 **Roles**

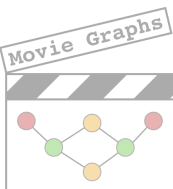
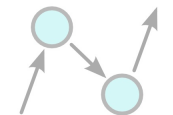


 **Attributes**

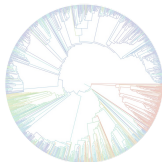


 **Behaviors**

↑
ConceptNet



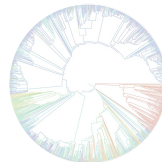
↑
Taxonomy



↑
OpenAI GPT-3

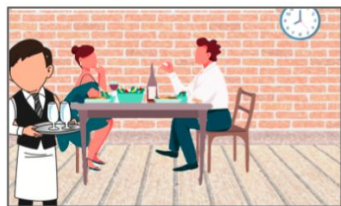


↑
Taxonomy



↑
OpenAI GPT-3

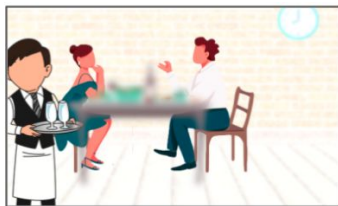




 **Setting**



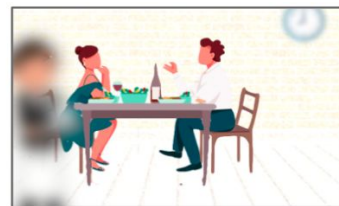
 **Environment**



 **Roles**



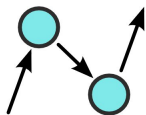
 **Attributes**



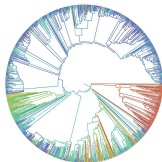
 **Behaviors**



ConceptNet



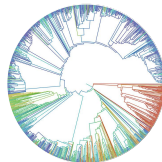
Taxonomy



OpenAI GPT-3



Taxonomy



OpenAI GPT-3



Building NormBank

S **SETTING:** dentist's office



B **BEHAVIOR:** ask for a toothbrush



S **SETTING:** dentist's office



B **BEHAVIOR:** ask for a toothbrush



→ **norm:** *expected* ✓

→ **norm:** *okay* ☁

→ **norm:** *unexpected* ✗

S **SETTING:** dentist's office



B **BEHAVIOR:** ask for a toothbrush



→ **norm:** *expected*



S **SETTING:** dentist's office



B **BEHAVIOR:** ask for a toothbrush



→ **norm:** *expected*



PERSON's attribute: child



S **SETTING:** dentist's office



B **BEHAVIOR:** ask for a toothbrush



→ **norm:** *expected*



PERSON's attribute: child



PERSON's role: patient



S **SETTING:** dentist's office



B **BEHAVIOR:** ask for a toothbrush



→ **norm:** *expected*



PERSON's attribute: child



PERSON's role: patient



OTHER's role: dentist



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



Add a New "Expected" Table (OR)

→ norm: *expected*



PERSON's role: dental hygienist



OTHER's role: dental assistant



PERSON's behavior: brush a patient's teeth



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)

→ norm: *expected*



PERSON's role: dental hygienist



OTHER's role: dental assistant



PERSON's behavior: brush someone's teeth



S **SETTING:** dentist's office



B **BEHAVIOR:** ask for a toothbrush



→ norm: okay



PERSON's role: patient



OTHER's role: dental hygienist



→ norm: unexpected



PERSON's role: receptionist



→ 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)

→ norm: expected



PERSON's role: dental hygienist

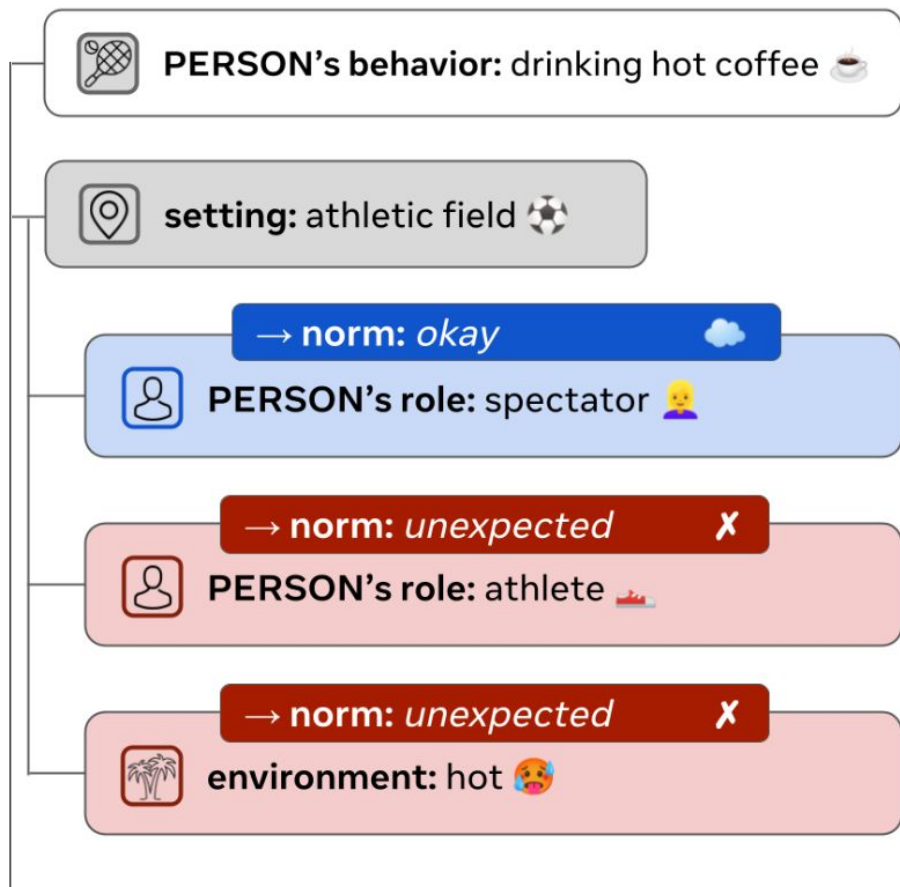


OTHER's role: dental assistant



PERSON's behavior: brush someone's teeth







PERSON's behavior: drinking hot coffee ☕

Behaviors:

6,938



setting: classroom 🍎

→ norm: *okay* ☁



PERSON's role: teacher 👩🏫



PERSON's role: student 🧑🎓

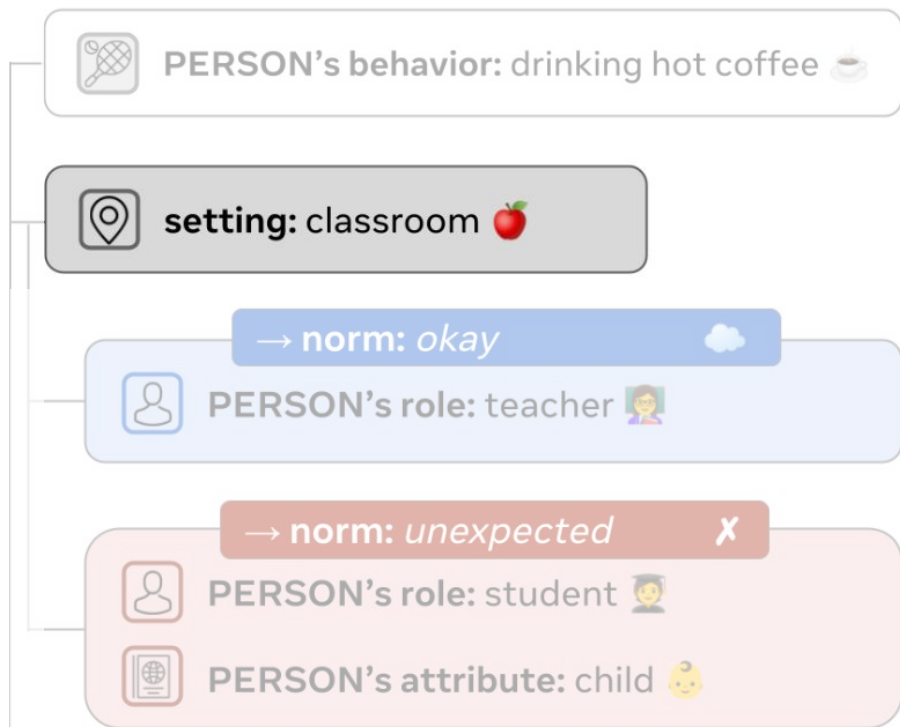
→ norm: *unexpected* ✖



PERSON's attribute: child 🧒

Annotation statistics

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

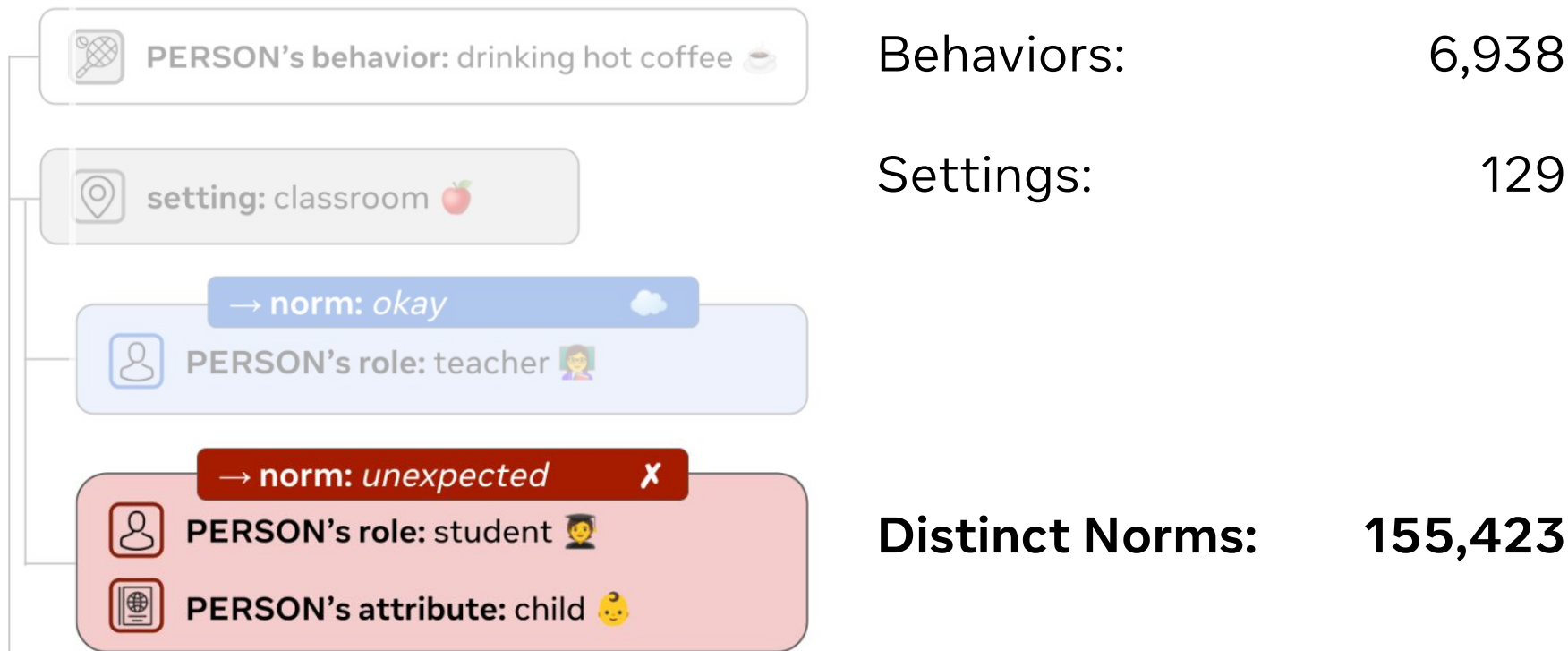


Behaviors: 6,938

Settings: 129

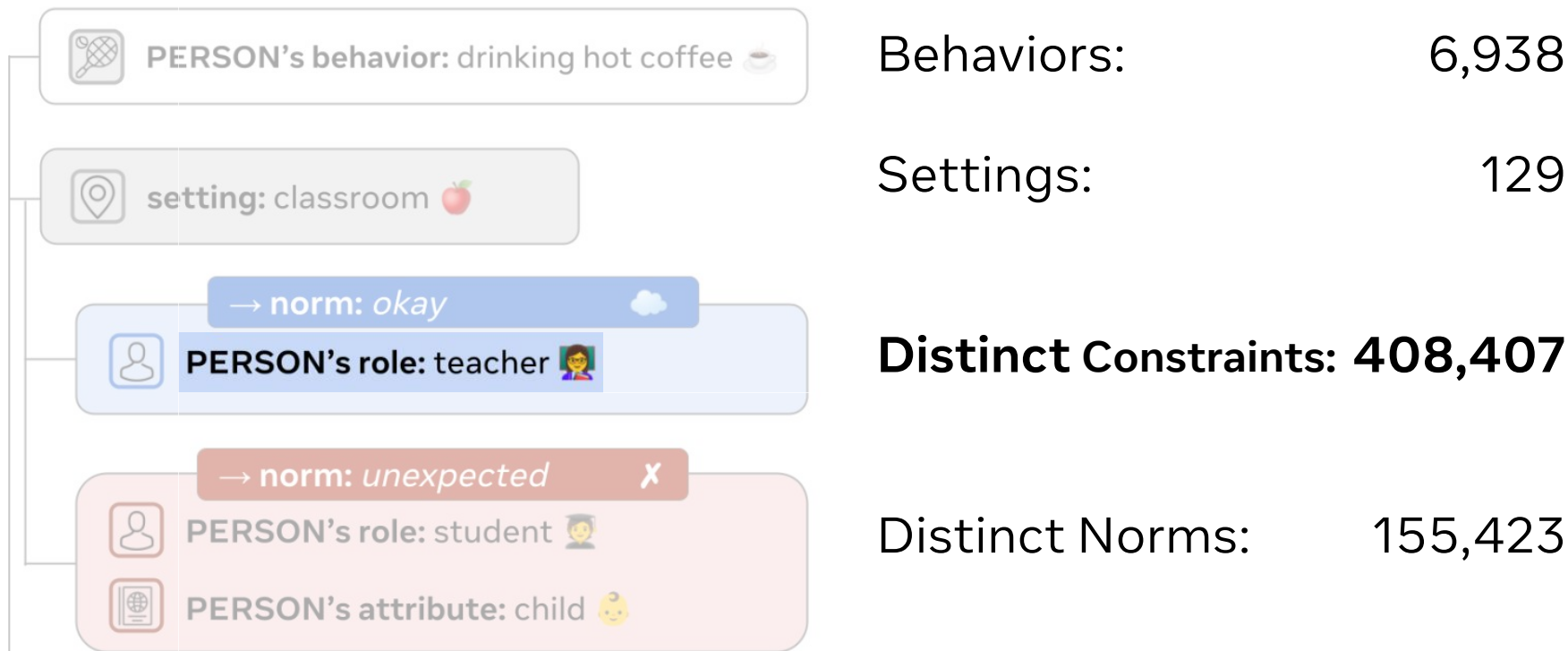
Annotation statistics

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



Annotation statistics

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



Annotation statistics

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

Using NormBank

Use Cases

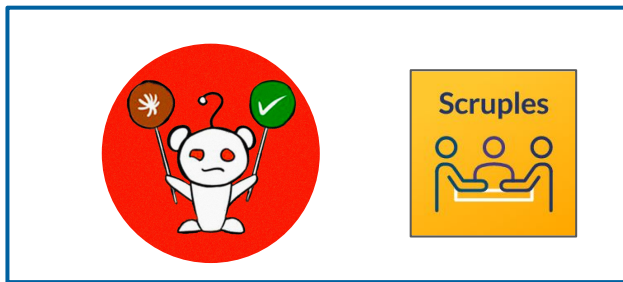
1. **Knowledge Bank**
2. **Seed** for NLP **Tasks**
3. **Ground** for Social Commonsense Knowledge **Transfer**

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**



Transfer



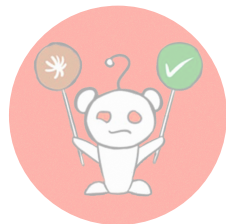
SCRUPLES ANECDOTES

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?*

[0] Author [1] Other [2] Everybody [3] Nobody [4] Needs
more information

Transfer



SCRUPLES
ANECDOTES

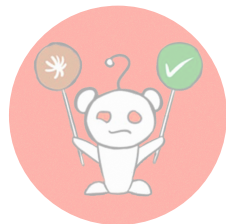
	Base
ANECDOTES	68.3%

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?*

[0] Author [1] Other [2] Everybody [3] Nobody [4] Needs more information

Transfer



SCRUPLES
ANECDOTES

	Base	+ NormBank
ANECDOTES	68.3%	68.7% ☆

☆ Significant improvement over base

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?*

[0] Author [1] Other [2] Everybody [3] Nobody [4] Needs more information

Transfer



SCRUPLES DILEMMAS

	Base	+ NormBank
ANECDOTES	68.3%	68.7% ☆
DILEMMAS	64.3%	71.1% ☆

☆ Significant improvements over base

Transfer



	Base	+ NormBank
ANECDOTES	68.3%	68.7% ☆
DILEMMAS	64.3%	71.1% ☆
<i>CosmosQA</i>	59.8%	61.2%

Transfer



	Base	+ NormBank
ANECDOTES	68.3%	68.7% ☆
DILEMMAS	64.3%	71.1% ☆
<i>CosmosQA</i>	59.8%	61.2%
Social IQa	59.9%	64.2%

Expanding NormBank

Knowledge Expansion Methods

1. Classification

Considerations:

- Massive constraint space
- Assumes a “closed world”

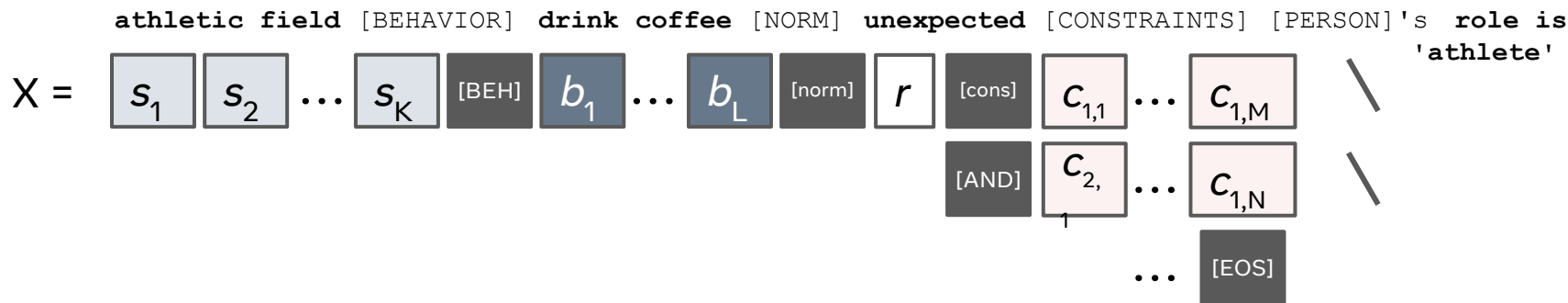
Knowledge Expansion Methods

1. Classification

Considerations:

- Massive constraint space
- Assumes a “closed world”

2. Generation



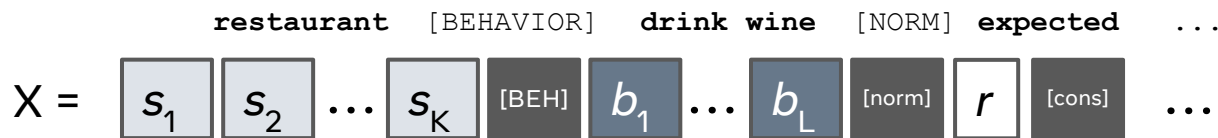
Knowledge Expansion Methods

1. Classification

Considerations:

- Massive constraint space
- Assumes a “closed world”

2. Generation



fill in the blank

Knowledge Expansion Methods - **Generation Results**

Model	Sensible Norm	Correct Norm	Normative Constraint	Helpful Constraint
Max	100.%	100.%	100.%	100.%

Knowledge Expansion Methods - **Generation Results**

Model	Sensible Norm	Correct Norm	Normative Constraint	Helpful Constraint
Human	82.5%	55.0%	72.9%	81.7%
Max	100.%	100.%	100.%	100.%

Knowledge Expansion Methods - **Generation Results**

Model	Sensible Norm	Correct Norm	Normative Constraint	Helpful Constraint
BART	100.0%	46.0%	94.3%	94.3%
Human	82.5%	55.0%	72.9%	81.7%
Max	100.0%	100.0%	100.0%	100.0%

Knowledge Expansion Methods - **Generation Results**

Model	Sensible Norm	Correct Norm	Normative Constraint	Helpful Constraint
GPT-3	95.0%	61.1%	91.8%	87.8%
BART	100.%	46.0%	94.3%	94.3%
Human	82.5%	55.0%	72.9%	81.7%
Max	100.%	100.%	100.%	100.%

Conclusion



PERSON's behavior: drinking hot coffee ☕



setting: athletic field ⚽

→ norm: okay ☁



PERSON's role: spectator 🧑

→ norm: unexpected ✖

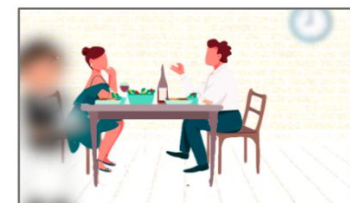
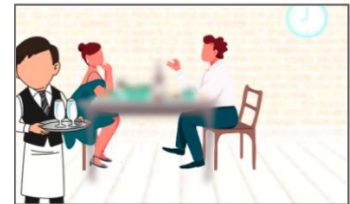
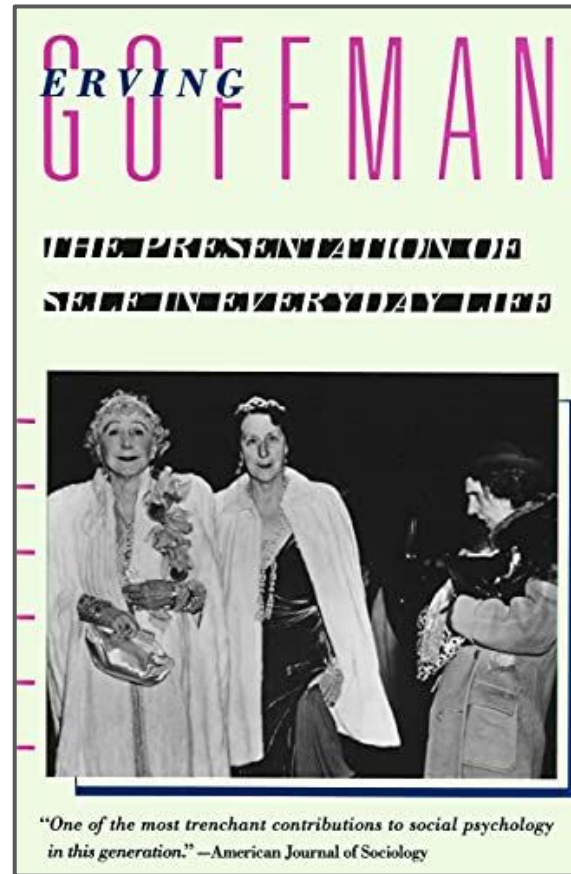


PERSON's role: athlete 🏃

→ norm: unexpected ✖



environment: hot 🥵



Setting



Environment



Roles



Attributes



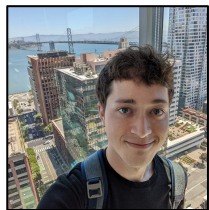
Behaviors

NormBank:

A Knowledge Bank of Situational Social Norms

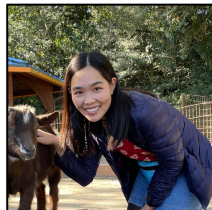
<https://github.com/SALT-NLP/normbank>

Caleb Ziems



@cziems

Jane Dwivedi-Yu



@JaneDwivedi

Yi-Chia Yang



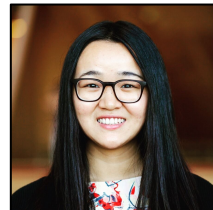
@Meta

Alon Y. Halevy



@Meta

Diyi Yang



@Diyi_Yang