Towards Countering Essentialism through Social Bias Reasoning

Emily Allaway$^{1,2}$ Nina Taneja$^1$ Sarah-Jane Leslie$^3$ Maarten Sap$^{2,4}$
$^1$Columbia University, USA $^2$Allen Institute for Artificial Intelligence, USA $^3$Princeton University, USA $^4$Carnegie Mellon University
eallaway@cs.columbia.edu

1 Introduction

Essentialism, i.e., the belief that members of the same group are fundamentally alike, plays a crucial role in how prejudices and biases about social and demographic groups are formed and expressed (Leslie, 2014). For example, the statement “I speak English, I don’t speak libt*rd” implies the belief that all “liberals are stupid.” If left unchallenged, statements with such essentializing implications can cause harm by perpetuating and reifying stereotypical beliefs about social groups (Greenwald and Banaji, 1995; Steele, 2011; Prentice and Miller, 2007; Rhodes et al., 2012; Leshin et al., 2021).

In this work, we investigate the task of combating essentialist statements and beliefs through psychologically and linguistically informed counterstatement generation. We examine these essentialist beliefs through the lens of generics (Rhodes et al., 2012), i.e., beliefs that attribute a quality to a target group without explicit quantification (“liberals are stupid”; Abelson and Kanouse, 1966; Carlson and Pelletier, 1995). In the context of toxic or hateful language, these generic beliefs can be both expressed directly or conveyed through subtle implications (Gelman, 2003; Sap et al., 2020).

Automatically countering essentialism is challenging because it requires deep psychological reasoning about the linguistic implications of statements – for example, changing people’s beliefs about stereotypes only through counterexamples is difficult (Kunda and Oleson, 1995). Therefore, we examine five different strategies for combatting essentializing stereotypes, combining insights from psychology (Foster-Hanson et al., 2016, 2019; Wodak et al., 2015) and NLP (Allaway et al., 2023).

We craft five types of statements (see Fig 1): broadening the scope of a stereotype by generalizing...
to “all people” or an alternative group (LOTS and ALT), providing direct counter-evidence through specific individuals or groups (DIR-IND and DIR-GRP), and simply calling out the generalization (TOL). In contrast to prior studies on countering hate-speech which use uncontrolled end-to-end generation approaches (Qian et al., 2019; Zhu and Bhat, 2021; Chung et al., 2020, e.g.), we generate counterstatements by reasoning directly about the targeted group, attributed quality, and linguistic expression of a stereotype.

Since our work provides a preliminary exploration of this task, we conduct online studies in three settings where counterstatements are paired with human-written implications from the Social Bias Frames Inference Corpus (SBIC) (Sap et al., 2020). In these settings, we explore variation in counterstatement effectiveness when the beliefs are conveyed either implicitly, explicitly without context, or as an explicit inference from provided context. We find that challenging a stereotype by applying it broadly (e.g., to “lots of people”; LOTS and ALTS; Figure 1) is generally the most preferred strategy. In contrast, statements containing direct counter-evidence (e.g., DIR-IND and DIR-GRP; Figure 1) are the least popular. Additionally, we observe that the most favored strategy varies depending on whether the stereotype is explicitly presented to annotators (e.g., providing the essentialist belief in Figure 1) or only conveyed implicitly (e.g., only providing the first statement in Figure 1). For example, direct counter-evidence is more popular when the stereotype is explicitly provided. Our results highlight the complexity of countering essentialist beliefs and the importance of further investigation at the intersection of NLP and psychology.

2 Automatically Countering Essentialism

We operationalize our counterstatement generation by focusing on the expression of stereotypes through generics (§2.1). Inspired by work in psychology and philosophy, we construct five types of counterstatements to a stereotype (§2.2).

2.1 Stereotypes as Generics

Many negative stereotypes are expressed as generics; they generalize a dangerous or harmful quality (e.g., being a drunkard) to an entire group (e.g., Scots) based on the behavior of only a few individuals. Leslie (2008, 2017) termed such generics striking and argued that such generalizations are based upon an assumption that all members of the group in question (e.g., Scots) are disposed to possess the dangerous or harmful quality. We argue that many stereotypes can also be interpreted as asserting a quasi-unique association between the group and quality. For example, “Scots are drunkards” also implies that Scots are distinctly more likely than other groups (e.g., the English) to exhibit drunkenness. In our work, we assume that all stereotypes under consideration are generics and have both interpretations.

Since generics are unquantified, they naturally allow for exceptions (i.e., counterexamples to the generic). While these exceptions may provide a relevant source of counter-statements for a stereotype, some evidence from psychology suggests that people are adept at maintaining their stereotyped beliefs in the face of such specific exceptions (e.g., Kunda and Oleson, 1995). Therefore, we experiment with a variety of different counter-statements.

2.2 Generating Counter-Speech

To generate counter-speech to stereotypes, we produce five types of outputs in three broad categories (see Table 1). Since the stereotypes we consider are expressed as generics (e.g., “Scots are drunkards”), they can be separated into three components: a group (e.g., Scots), a relation (e.g., are), and a quality (e.g., “drunkards”), which we use to construct the counter-speech. Additionally, we prepend the sentence “Actually, this is a generalization about GROUP” to each type of statement we generate, in order to contextualize the statements as counter-speech.

Direct Exceptions (DIR) Direct exceptions present subgroups or individuals that do not have the quality specified in the generic, and thereby counter the striking or extrapolating implications of the stereotype. For example, for “Scots are drunkards”, the extrapolating implication is that “All Scots are drunkards”; thus, direct exceptions would be either individual Scots (e.g., Ewan McGregor1) or sub-groups of Scots (e.g., Scottish babies) who are not drunkards. We follow Allaway et al. (2023) who propose that these exceptions can be constructed with the following template:

GROUP(x) + not relation + QUALITY. (DIR)

1https://fherehab.com/learning/celebrities-who-dont-drink
Women are sex objects. +

(DIR-GRP) The following women are not sex objects: businesswomen, female athletes, and female movie stars.

(DIR-IND) The following women are not sex objects: Ellen DeGeneres, Sarah Palin, and Rachel Maddow.

(ALT) Men can also be sex objects.

(LOTS) Lots of people can be sex objects.

(TOL) All groups of people deserve tolerance.

Black people don’t work +

(DIR-GRP) The following black people work: black businessmen, famous black people, and black movie stars.

(DIR-IND) The following black people work: Barack Obama, Misty Copeland, and Usain Bolt.

(ALT) White folks may also not work.

(LOTS) Lots of people don’t work.

(TOL) All groups of people deserve tolerance.

Ethiopian people are dirty +

(DIR-GRP) The following Ethiopian people are not dirty: male athletes, female movie stars, and people who practice Judaism.

(DIR-IND) The following Ethiopian people are not dirty: Kenyan marathon runners, Michael Jackson, and Ryan Reynolds.

Muslims are terrorists +

(DIR-GRP) The following Muslims are not terrorists: male Muslim businessmen, Muslims businessmen, and male Muslim movie stars.

(DIR-IND) The following Muslims are not terrorists: adult Muslim men, all Muslims, and Malala Yousafzai.

A Muslim enters a building.

With 500 passengers and a plane

Actually, this is a generalization about Muslims. +

(DIR-GRP) The following Muslims are not terrorists: male Muslim businessmen, Muslims businessmen, and male Muslim movie stars.

(DIR-IND) The following Muslims are not terrorists: adult Muslim men, all Muslims, and Malala Yousafzai.

Table 1: Automatically generated counterstatements (§2.2) from our system. The bottom two examples illustrate challenges with factuality in the DIR counterstatements.

We say that $\text{GROUP}(x)$ is satisfied if $x$ is either a specific member of the group or a subgroup. We generate subtypes (i.e., subgroups and specific group members) using GPT-3 (Brown et al., 2020). In particular, we prompt GPT-3 with a list of subtypes for an example group not in our data and query the model to produce subtypes for GROUP as the prompts completion. We choose as our example group “men” (see Appendix A.1 for prompts). We then construct exceptions following template DIR using each generated subtype. In order to select the most truthful and relevant subtypes, we apply a truth discriminator from Allaway et al. (2023) to each exception, and rank the subtypes by the probability of being true and relevant. We construct the final statements by combining the top three ranked subgroups into a single exception ((DIR-GRP) in Table 1) and combining the top three individuals into a single exception ((DIR-IND) in Table 1).

Broadening Exceptions (ALTER) Broadening exceptions challenge the quasi-unique implication of the generic by attributing the quality in question to a different social group (e.g., “Americans can also be drunkards”). Allaway et al. (2023) propose that these exceptions follow the template:

$\sim \text{GROUP}(x) + \text{relation} + \text{QUALITY}$. (ALT)

where $\sim \text{GROUP}$ indicates a contextually relevant alternative group. For example, if GROUP = SCOTS, then a contextually relevant alternative would be $\sim \text{GROUP} = \text{AMERICANS}$. In our work, we define the relevant alternative group $\sim \text{GROUP}$ to be the perceived oppressing group. For example, if the generic is “women are vain”, then “men” would be the relevant alternative group $\sim \text{WOMEN}$ (i.e., the oppressing group). To avoid generating stereotypes about the oppressing group, we convert the relation into a hedged form (see Appendix A). For example, if the relation is “are”, the hedged form of the relation would be “can be”.

Broadening Universals (LOTS) In addition to broadening exceptions, we generate broadening universals, which maximize the scope of the quality so that it includes people in general, rather than any specific social group. That is, we generate
statements following:

Lots of people + relation + QUALITY. (LOTS)
For example, “Lots of people are drunkards” is a broadening universal for the stereotype “Scots are drunkards”. See (LOTS) in Table 1. Similarly to the statements following template ALT, we also hedge the relation in template LOTS.

Tolerance (TOL) Finally, we include the denouncing statement, “All groups of people deserve tolerance”, since denouncing is a common strategy in countering hate-speech (e.g., Mathew et al., 2019; Qian et al., 2019; Ziegele et al., 2018). This form of counter-speech does not depend on the details of the generic in question and so is the same for all stereotypes. See (TOL) in Table 1.

3 Online Study
As a preliminary investigation into the task of generating counterstatements to combat essentialism, we use posts with gold-annotated implications (§3.1) to conduct an online experiment with crowd-workers (§3.2).

3.1 Essentialism Data
We use annotations provided in the SBIC (Sap et al., 2020) to obtain pairs \((t, s)\) where \(t\) is a text and \(s\) is a stereotype implied by \(t\) (i.e., an essentialist implication that can be drawn from \(t\)). The \(s\) in SBF are human written and so to ensure the statements we consider are clear implications of the text \(t\), we use only instances where at least two out of the three human annotators wrote the same stereotype verbatim. This results in a set of 227 pairs, covering 25 unique groups, where each \(s_i\) can be clearly inferred from \(t_i\).

3.2 Study Setup
In order to investigate the effectiveness of different counter statements (§2), we conduct three different human studies. In each study, we ask annotators on Amazon Mechanical Turk to play the role of an online content moderator or fact-checker whose job is to provide counterstatements to expressed stereotypes. Each annotator is provided with a statement and a set of machine-generated counterstatements and asked to select their first and second choices. We also include an attention check to monitor annotation quality, and collect information on how much annotators agree with the provided statement and annotator demographic information. See full instructions in Appendix B.

Our three human studies vary the statements provided to annotators: (1) \(\text{post}\) – an original text \(t\) from SBF, (2) \(\text{stereo}\) – the stereotype \(s\) implied by a text \(t\), or (3) \(\text{post + stereo}\) – both \(t\) and \(s\). Note that for each pair \((t, s)\) the counterstatements are always derived from \(s\), regardless of whether annotators are provided \(s\) directly.

4 Empirical Results
Our results show clear differences in how often certain types of counterstatements are preferred over others to combat essentialism (Figure 2). We see that overall, the LOTS counterstatements are the most popular for both first and second choice. In addition, when considering broadening statements grouped together (LOTS and ALT), there is a clear preference for such statements, compared to both the TOL and the direct exceptions. Despite the lack of content in the TOL statements, these are the second most popular as the first choice. Note, we choose not to conduct statistical tests because our goal is not to find the single most effective countering strategy but rather to study a range of strategies.

Of the generics-exceptions-based counterstatements, the direct exceptions DIR are consistently the least preferred. We hypothesize that this is impacted by the high portion of incorrect statements among the DIR type (Figure 3), as well as the subjective nature of many stereotypes (e.g., in Table 1,
being a ‘sex object’ is subjective). When considering only the statements not marked as incorrect by annotators, we do not observe a change in relative popularity. Therefore, future investigation is needed to understand the role of correct individuals in counterstatements.

In contrast, the broadening exceptions ALT rank second as the second-choice and only 7% are marked as incorrect. We also note that in settings where the stereotype is provided explicitly (stereo and stereo+post) the proportion of LOTS was higher (and Tol lower) for the first choice, and for the second choice the proportion of ALT increased markedly. From this we observe that the effectiveness of a countering strategy may depend on the explicitness of the demonstrated bias. For example, generalizing the stereotype (LOTS) may be less effective when the stereotype is not explicitly identified (post setting).

Finally, we observe that when annotators agree with a statement, their preference for LOTS statements increases while the preference for DIR counterstatements decreases (Fig. 4a). Annotator preference for Tol also decreases. We also note that annotators more often endorse a belief when it is stated explicitly, rather than implied by a text (Fig. 4b) These results underscore the importance both of directly identifying an essentialist belief from an implication and of reasoning about the implications of the stereotype when countering real-world essentialist beliefs (i.e., from individuals who endorse the belief).

5 Discussion and Conclusion

Through our online studies, we find that broadening statements are the most preferred type of counterstatement, while statements with direct counter-evidence are consistently least preferred. In addition, we observe variation across our three settings. Below, we discuss how are findings related to work in psychology (§5.1) and content moderation

5.1 Stereotypes and Psychology

Generic language, with its quasi-unique implications, readily conveys essentialist beliefs. Indeed, psychological research shows that generic language is a powerful mechanism by which social essentialist beliefs are transmitted between people, and even across generations (Rhodes et al., 2012; Leshin et al., 2021). Such implications can have a profound impact on children — e.g., girls as young as 6 years old have absorbed the stereotype that males are more likely than females to be “really, really smart” (Bian et al., 2017). In order to challenge such essentialist beliefs, we argue that it is important to consider the complexities of generics and associated inferences.

Through reasoning directly about the implications of generics, we construct counterstatements that directly challenge essentialist implications. In particular, our results highlight the value of broadening statements (LOTS and ALT), which counter the implication that a particular negative quality is distinctive of a particular group (e.g., “Only women are vain”). This finding is consistent with recent work in psychology, in particular (Foster-Hanson et al., 2019). These statements thereby challenge the cognitive value of the stereotype as an information-processing short-cut (Devine, 1989), since the wide applicability of the stereotyped qual-
ity may result in many incorrect inferences (e.g., assuming someone is not vain because they are not a woman).

Furthermore, our results corroborate findings from psychology that individuals who do not fit a stereotype are not viewed as invalidating that stereotype, since they are categorized as special (e.g., Kunda and Oleson, 1995). In particular, the consistently low preference for direct exception statements comports with that finding (DIR-IND and DIR-Grp). Although providing facts (e.g., exceptional individuals) has been previously studied as a strategy to counter hate-speech (e.g., Chung et al., 2019; Mathew et al., 2019), our work specifically isolates the type of facts (i.e., direct counter-evidence versus broadening statements) as a variable for investigation. As such, we can observe that providing broadening facts is much more effective than counter-evidence. This further highlights the importance of reasoning about the specific implications of a text to counter essentialist beliefs.

5.2 Essentialism, Counter Hate-Speech, and Content Moderation

Although countering essentialism is similar in spirit to countering hate-speech and content moderation, common strategies in the latter are often inapplicable to countering essentialist beliefs. In content moderation, discursive actions such as answering clarifying questions or providing additional details are common (Ziegele et al., 2018). However, since essentialist beliefs are often conveyed implicitly (e.g., see statements in Figure 1), discursive actions aimed at a text may not actually address its essentialist implications. For example, the additional detail “libt*rd is not a real language” does not actually counter the implication that liberals are stupid in Fig 1. Similarly, while humor, expressing affiliation with the targeted group (e.g., “us Scots only having a wee cuppa tea”), and pointing out hypocrisy or contradictions (e.g., “it needs to involve food to be a meal”) are common when countering hate-speech (Chung et al., 2019; Mathew et al., 2019), they also do not address the essentialist beliefs implicit in a text (e.g., that Scots are drunkards, Figure 1). As such, we argue that it is important to investigate effective ways to counter essentialist implications, as distinct from general counter-speech and content moderation.

Human-annotated implications Since this work constitutes preliminary investigation on the promise of using NLP tools for combating essentialism, we used a corpus of statements paired with gold human-annotated implications. However, such annotations will not always be available. Future work should examine whether our findings would hold with machine-generated implications (e.g., using the neural model from Sap et al., 2020), on various types of source domains and overtness levels (e.g., the corpus of implicit toxicity from Hartvigsen et al., 2022). Furthermore, future research could investigate how the quality and specificity of the implications affects the counterstatement generation and effectiveness.

Targeted group and annotator identity Our studies are conducted on Amazon Mechanical Turk which can be lacking in diversity among annotators. For example, the majority of annotators in our study were white (Fig 5a) or male (Fig 5b). In contrast, targeted groups are often not white or male (see Table 2). Since an annotator’s identity and beliefs may impact their perceptions of how effective a counterstatement is (as they do with perceptions of toxicity; Sap et al., 2022), homogeneity in the annotator population limits our results. Additionally, how deeply rooted an essentialist belief is for an annotator may impact what they consider ef-
Table 2: Counts for number of examples per group. There are 227 examples total across 25 unique groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Nb Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black folks</td>
<td>66</td>
</tr>
<tr>
<td>Women</td>
<td>60</td>
</tr>
<tr>
<td>Muslim folks</td>
<td>18</td>
</tr>
<tr>
<td>Jewish folks</td>
<td>16</td>
</tr>
<tr>
<td>Asian folks</td>
<td>15</td>
</tr>
<tr>
<td>Gay men</td>
<td>7</td>
</tr>
<tr>
<td>Latino/Latina folks</td>
<td>6</td>
</tr>
<tr>
<td>Liberals</td>
<td>5</td>
</tr>
<tr>
<td>Feminists</td>
<td>4</td>
</tr>
<tr>
<td>African folks</td>
<td>3</td>
</tr>
<tr>
<td>Mentally disabled folks</td>
<td>3</td>
</tr>
<tr>
<td>Indian folks</td>
<td>3</td>
</tr>
<tr>
<td>Lesbian women</td>
<td>3</td>
</tr>
<tr>
<td>Immigrants</td>
<td>3</td>
</tr>
<tr>
<td>Ethiopian folks</td>
<td>3</td>
</tr>
<tr>
<td>American folks</td>
<td>2</td>
</tr>
<tr>
<td>Mexican folks</td>
<td>2</td>
</tr>
<tr>
<td>Physically disabled folks</td>
<td>1</td>
</tr>
<tr>
<td>Folks with mental illness/disorder</td>
<td>1</td>
</tr>
<tr>
<td>Japanese folks</td>
<td>1</td>
</tr>
<tr>
<td>Polish folks</td>
<td>1</td>
</tr>
<tr>
<td>Arabic folks</td>
<td>1</td>
</tr>
<tr>
<td>Italian folks</td>
<td>1</td>
</tr>
<tr>
<td>Christian folks</td>
<td>1</td>
</tr>
<tr>
<td>Native American/First Nation folks</td>
<td>1</td>
</tr>
</tbody>
</table>

6 Societal and Ethical Considerations

Annotation Considerations Prior work has highlighted the potential harms to workers who are subjected to offensive statements (Roberts, 2017; Steiger et al., 2021). To mitigate these, we encourage annotators to reach out to the authors with concerns and questions or to the Crisis Text Line.2 Additionally, our study design was approved by our ethics review board (IRB) and workers earned a median wage of $10/h.

Risks of Generation Since our system automatically generates counterstatements, there is potential for misuse in several ways. First, our system can automatically and quickly produce millions of counterstatements could therefore be used in a distributed-denial-of-service attack. Second, by generating counterstatements to stereotypes in text the original text remains available and so it may still cause harm (Ullmann and Tomalin, 2019) and perpetuate essentialist beliefs. Additionally, the automatic construction of counterstatements has the potential to produce false statements and further harmful generalizations (e.g., generalize a harmful stereotype to another marginalized group). Considering these factors, it is important to jointly develop regulation alongside AI technology to limit harms and misuse in deployment (Crawford, 2021; Reich et al., 2021).

2https://www.crisistextline.org/
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To construct the hedged counterstatements, if the main verb is ‘is’ or ‘are’ we convert it to ‘can also be’. For example, ‘men are vain’ becomes ‘men can also be vain’. If the main verb is ‘should’ we convert it to ‘should also’. Otherwise, we insert ‘may also’ before the quality. For example, ‘men think they know everything’ becomes ‘men may also think they know everything’.

We also note that the group names in Table 2 have been normalized. We will include both the normalized and unnormalized names in the released data.

A.1 GPT-3 Generation

We access GPT-3 using the API from OpenAI\(^3\). To obtain subtypes from GPT-3 we use the ‘davinci’ model and top-p sampling with \(p = 0.9\), temperature 0.8 and maximum length 100 tokens. The presence and frequency penalties are both 0. We kept the top 5 generations from GPT-3. We filter out generations that are the same as the queried group. The prompts are shown in Table 3. We randomized the order of the 5 examples in each prompt for every group.

B Human Studies

For our user studies, we recruit annotators from Amazon Mechanical Turk who were qualified for a toxicity explanation task from our previous work (Anonymous, 2020).\(^4\) Racial and gender breakdowns of our annotator pool are in Figure 5. Annotators were paid $0.27 per task. For each instance in each of the three settings we have 3 annotators. This study was approved by our institution’s ethics board (IRB).

We show the detailed task instructions in Figure 6. An example of the task setup is shown in Figure 7. Before choosing the most convincing counter statements, annotators have the option to mark each statement as incorrect or ungrammatical (Figure 7b). Note that before asking annotators to select their second choice, we include an attention check (in Figure 7c). The attention check was randomly set in each HIT. Annotations where the attention check incorrect were discarded. As a result, we removed 3 annotations from the post setting, 5 from the stereo setting, and 4 from post+stereo.

For each annotation, we also collected demographic information (Figure 8). The demographic information is associated only with an anonymized annotator ID. Additionally, before annotators select counter-statements, we ask annotators

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3https://beta.openai.com/docs/introduction

4Anonymized to preserve double-blindness of reviewing, will be de-anonymized upon public release.
Consider the following groups of men:
1. male students
2. male authors
3. male athletes
4. businessmen
5. male movie stars
###
###

Consider the following groups of men:
1. Barack Obama
2. Sherlock Holmes
3. Usain Bolt
4. Ryan Reynolds
5. Stephan Hawking
###
###

Table 3: Prompts for generating subtypes for GROUP from GPT3 (e.g., GROUP=women).

<table>
<thead>
<tr>
<th>Counterstatement Type</th>
<th>Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIR-GRP</td>
<td>Consider the following groups of men: 1. male students 2. male authors 3. male athletes 4. businessmen 5. male movie stars ###</td>
</tr>
</tbody>
</table>

Figure 6: Detailed annotation instructions for human studies.

(a) Input presentation for post+stereo setting. The statement was removed for the stereo setting and the stereotype was removed in the post setting.

(b) Example presentation. All five types of counter statements are listed in the same manner.

(c) Annotation questions and attention check.

Figure 7: Details of the annotation task for human studies.
Figure 8: Demographic questionnaire in human studies.

Figure 9: Questions about stereotype belief of annotators.

to indicate their own belief in or agreement with the provided statement and stereotype (Figure 9).