TAMA: Target-Aware Multilingual Abuse Detection by Cascaded Conditional Multi-Task Learning

Anonymous ACL submission

Abstract

Protecting public figures from online abuse requires models that go beyond post-level classification to determine whether abuse is directed at a designated target, characterize the abuse intent, and extract textual evidence. We introduce a **T**arget-**A**ware **M**ultilingual **A**buse (**TAMA**), benchmark of 9,386 X (Twitter) posts aimed at public figures, with aligned supervision for (i) tri-class target detection, (ii) 12-way fine-grained abuse type classification, and (iii) phrase-level abusive spans localization. To exploit the hierarchical coupling of these tasks, we propose **Cascaded-MTL**, a dependency-aware multi-task framework that conditions downstream predictions on upstream beliefs via three lightweight modules: Cross-Task Feature Fusion (CTF), Task-Adaptive Gating (TAG), and Label-Guided Span Detection (LGSD). Experiments across three multilingual encoders show that Cascaded-MTL consistently yields higher average F1 than single-task and standard multi-task training and delivers robust gains on type classification and span localization. The code and the dataset are released here: `https://anonymous.4open.science/r/CASCADED-MTL-17FA/README.md`.

Disclaimer: The examples presented by this paper may be considered offensive or vulgar.

1 Introduction

Online abuse poses a critical challenge for platforms, undermining political debate, news consumption, and public engagement (Galpin and Vernon, 2024). Public figures, including politicians, journalists, and activists, are disproportionately targeted by coordinated harassment and reputational attacks that often spill over into offline harm (Sobieraj, 2020; Posetti et al., 2021). Such pressure induces a significant "chilling effect", leading to self-censorship and strategic withdrawal from platforms, particularly among underrepresented groups (Vogels, 2021).

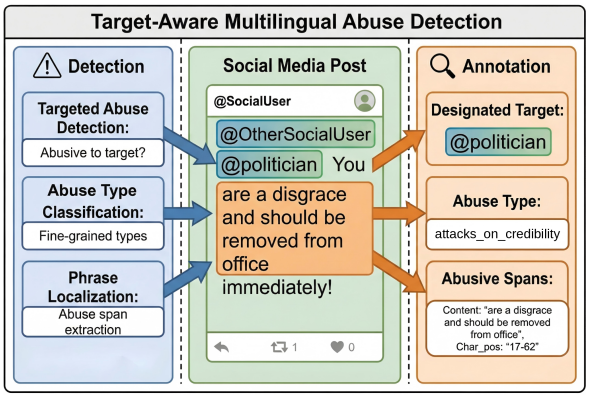

Figure 1: An overview of the TAMA benchmark. TAMA introduces three interdependent dimensions: (i) targeted abuse detection to identify whether abuse is directed at the designated public figure; (ii) abuse type classification into 12 fine-grained abuse types; and (iii) phrase localization with character-indexed abusive expressions.

Public figures act as agenda setters and information intermediaries; coordinated campaigns against them can distort deliberation and weaken democratic accountability, with visibility amplifying both the volume and organization of attacks (Steffek, 2010). Critically, most automated moderation tools treat abusiveness as a generic post-level property, overlooking *who* is attacked and *how*. This "one-size-fits-all" approach is ill-suited for protecting public figures because it fails to reliably separate legitimate policy criticism from personalised, target-directed harassment. For content explicitly directed at an individual (e.g., @-mentions), moderation requires a more nuanced paradigm: *determining not just if a post is abusive, but whether it specifically targets the designated person, while providing span-level evidence to justify the decision.*

While interest has grown in abuse targeting particular entities (Pachinger et al., 2024; Bai et al., 2025), existing safety models typically lack ex-

Benchmark	Source	#Posts	Span	Target	Multilingual
AustroTox (Pachinger et al., 2024)	DerStandard	4,562	✓	✓	
HATECAT-TR (Şeker et al., 2025)	X (Twitter)	2,981	✓	✓	
GameTox (Naseem et al., 2025)	Online game chat	53,000	✓		
HateBRXplain (Salles et al., 2025)	Instagram	7,000	✓		
SCCD (Yang et al., 2025)	Weibo	38,999		✓	
STATE ToxiCN (Bai et al., 2025)	Zhihu&Tieba	8,029	✓	✓	
OffensEval (Zampieri et al., 2019)	X (Twitter)	13,200		✓	✓
HASOC (Mandl et al., 2021)	X (Twitter)&Facebook	17,657		✓	✓
UA-HSD-2025 (Ahmad et al., 2025)	X (Twitter)	5,240			✓
AfriHate (Muhammad et al., 2025)	X (Twitter)	90,437		✓	✓
HateDay (Tonneau et al., 2025)	X (Twitter)	240,000		✓	✓
TAMA (Ours)	X (Twitter)	9,386	✓	✓	✓

Table 1: Comparison of abuse detection benchmarks based on number of posts (#Posts), span-level annotations (Span), inclusion of Target (Target), and languages (Multilingual).

plicit target identification and phrase-level localization. To fill this gap, we first construct the **T**arget-**A**ware **M**ultilingual **A**buse (**TAMA**) benchmark; an overview is shown in Figure 1.

Unlike previous datasets, TAMA is directed at prominent public figures and provides aligned supervision for: (i) tri-class target detection (non-abusive, abusive towards target, or abusive towards others); (ii) 12-way fine-grained abuse types; and (iii) phrase-level spans marking the abusive expressions. Table 1 shows the differences between TAMA and previous abuse detection benchmarks.

We also introduce a Cascaded Conditional Multi-Task Learning (**Cascaded-MTL**) framework for jointly detecting multilingual, targeted abusive language against public figures. The framework uses a shared encoder with three heads for targeted detection, fine-grained abuse type classification, and phrase-level abusive span localization, and regulates inter-task information flow via complementary conditional strategies.

First, Cross-Task Feature Fusion (CTF) injects target detection decision evidence into the fine-grained abuse type classifier via logit-to-feature fusion. Second, Task-Adaptive Gating (TAG) enables differentiable information flow from target detection to abuse type classification through probability-based representation gating. Third, Label-Guided Span Detection (LGSD) conditions abuse span localization on the abuse type distribution to perform type-aware span extraction. This design yields efficient representation sharing, span-level interpretability, and robust performance across languages.

Our main contributions are:

- We release **TAMA**, a target-aware multilingual abuse benchmark for public figures with 9,386 posts and three aligned supervision signals per instance: tri-class target detection; 12-way fine-grained abuse types; and phrase-level abusive span.
- We propose **Cascaded-MTL**, a dependency-aware multi-task framework that follows the hierarchy *target* $\rightarrow$ *type* $\rightarrow$ *span* via three lightweight conditioning modules, yielding efficient representation sharing, span-level interpretability, and robust performances.
- We benchmark different encoder backbones and large language models (LLMs), and run targeted ablations over **CTF/TAG/LGSD** to isolate how each dependency link contributes to different task performance, establishing Cascaded-MTL as a strong, practical baseline for target-aware multilingual abuse moderation.

2 Related Work

The evolution of automated abuse detection has moved from coarse-grained classification toward increasingly granular taxonomies that account for target identity and linguistic evidence.

2.1 Shared Tasks and Target Taxonomies

Early benchmarks focused on binary or multi-class classification of hate and offense (Waseem and Hovy, 2016; Davidson et al., 2017). This was later formalised by major shared tasks such as OffensEval (Zampieri et al., 2019) and HatEval (Basile et al., 2019), which established a hierarchical standard where models first detect offensive posts and then categorise the target (e.g., *individual*

vs. *group*). Subsequent tasks like HASOC (Mandl et al., 2021) expanded these taxonomies to multilingual contexts, yet they largely maintain this categorical distinction.

While these benchmarks were instrumental in advancing the field, they treat "individual" as an anonymous category. Unlike these previous datasets, TAMA introduces explicit entity targeting, requiring models to resolve abuse to a specific, named individual specified *a priori*. This shifts the abuse detection task from broad category recognition to precise identity-aware detection.

Our focus on public figures builds upon early entity-centric studies, most notably Gorrell et al. (2018), who pioneered the use of **explicit target detection** through gazetteers and linguistic rules. However, this approach prioritises precision at the expense of recall, struggling with the high lexical variance of social media abuse. Our multilingual transformer backbone allows our model to capture subtle, non-keyword-based harassment, while maintaining the same commitment to explicit, identity-aware monitoring.

2.2 The Group-Centric Mismatch

Recent research has refined group-level detection to include specific ethnic and religious minorities in diverse sociocultural contexts (Şeker et al., 2025; Muhammad et al., 2025). However, a critical "mismatch" remains: Tonneau et al. (2025) demonstrate that models trained on fixed "academically popular" groups fail to generalise to real-world environments where victims vary wildly by region and time. This suggests that pre-defined taxonomies are inherently limited when it comes to protecting individuals from minority demographics.

Our work addresses this by moving beyond fixed categorical targets. Similar to the individual-focused analysis of cyberbullying (Yang et al., 2025), we center the person as the unit of analysis. However, by enabling explicit target specification, TAMA creates a system resilient to the "target mismatch" by adapting to the specific identity of high-risk public figures, such as journalists or activists. This granular focus is vital because, as already noted, the lack of explicit target modelling often prevents automated systems from distinguishing between vigorous public debate and the coordinated, identity-based harassment used to silence journalists and activists. By centering the specific entity, we provide the technical mechanism necessary to defend the "agenda setters" of democratic discourse from the chilling effects of personalised abuse.

2.3 Fine-grained Abuse and Explainability

As abuse becomes more sophisticated, interest has grown in identifying specific abusive behaviors and providing supporting evidence (Pachinger et al., 2024; Bai et al., 2025). While recent works add explanatory rationales (Salles et al., 2025), they often treat classification and span extraction as independent tasks. TAMA differs by providing a 12-way fine-grained taxonomy of harm, capturing nuances like reputational attacks and threats often conflated in coarse schemas, and aligning these with phrase-level abusive spans. Our Cascaded-MTL framework shows further innovation by conditioning span extraction on the identified abuse type, ensuring the highlighted evidence is semantically consistent with the model's decision.

3 Dataset

This section describes the data sources and filtering procedures, details the annotation methodology and quality control measures, and presents statistics for the final benchmark.

3.1 Task definition

We study multilingual targeted abusive language detection against public figures on X (Twitter). Each instance corresponds to a post and a designated public figure, represented by their official post handle. Although posts may mention multiple accounts, we focus on whether abuse is directed specifically at the pre-specified anchor target. This setup gives rise to three related tasks:

Task 1 (T1): Targeted abuse detection. For each post-target pair, we assign a tri-class label from the set *non-abusive*, *targeted-abusive*, or *unidentified-targets*, distinguishing between non-abusive content, abuse directed at the designated figure, and abuse aimed at other entities. Note that we remove *no-target* posts in the train phase as they do not explicitly point at any designated figures. Detailed category definitions of T1 labels are provided in Appendix C.

Task 2 (T2): Fine-grained abuse type classification. For *targeted-abusive* posts, we predict a fine-grained abuse type from the 12 categories defined by Posetti et al. (2023): *death_threat*, *sexual_assault*, *sexual_explicit*, *physical_harm*, *radiation_of_threats*, *attacks_on_credibility*, *misogynistic*, *homophobic*, *religious*, *political_sectarian*,

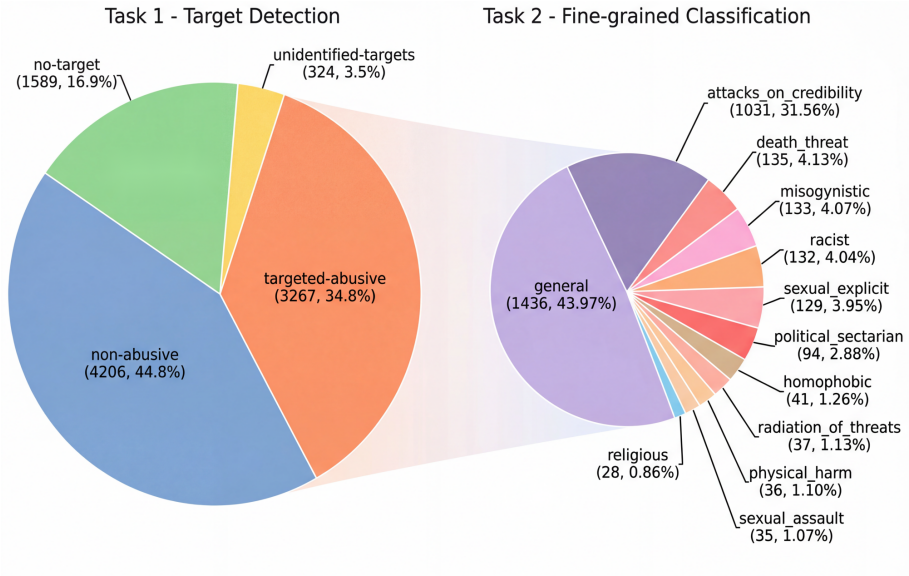

Figure 2: The overall data statistics of TAMA.

racist, *general*. Detailed category definitions of T2 labels are provided in Appendix D.

Task 3 (T3): Phrase-level abusive span localization. We identify spans of specific abusive expressions using character offsets in the post. Spans are provided only for *targeted-abusive* posts.

3.2 Data source and filtering

We focus on five public figures from politics and journalism: Theresa May, Liz Truss, Maria Ressa, Yulia Navalnaya, and Vladimir Soloviev. These targets are based in multiple countries (UK, the Philippines, and Russia), receive messages spanning multiple languages (including English, Russian, Filipino, Spanish, and Italian), and are known to attract sustained online harassment.

We retrieve 218,259 original posts (excluding replies and quotes) associated with these accounts. To build a balanced candidate pool, we apply IBM's Granite Guardian content-safety models (Padhi et al., 2025) in zero-shot mode to obtain coarse binary predictions (i.e. whether a post is abusive or not), then sample approximately 2,000 posts per public figure (balanced between predicted abusive and non-abusive), yielding 10,000 candidates. Zero-shot predictions from LLM serve only as prescreening signals and are never used as ground truth.

Before annotation, we perform text cleaning: removing deleted or unavailable posts, filtering exact duplicates and extremely short content, and ensuring each post contains a valid handle for one of the five public figures.

3.3 Annotation

Annotators follow detailed guidelines to determine whether a post is abusive, whether abuse targets the designated figure, what type of abuse is expressed, and which phrases contain the abuse. To mitigate bias, we assemble a diverse team of four voluntary annotators with varied backgrounds in gender, age, ethnicity, and region. We employ regular cross-validation and expert arbitration to ensure consistency.

We follow a multi-stage protocol to stabilise guidelines before full-scale annotation:

Pilots. In the first calibration round, we sampled 2,500 posts (500 per public figure) for dual annotation. We achieved an average Cohen's kappa of 0.2751 across the five public figures and inspected disagreements to refine the guidelines. A second calibration round confirmed substantial improvement, with agreement scores rising to 0.5480 across all targets.

T1&T2 annotation. Using finalized guidelines, we annotate the complete candidate pool. Each post receives independent dual annotation for T1 and T2 labels. Disagreements are resolved through discussion and expert arbitration. The final average Cohen's kappa score is 0.7096, indicating substantial agreement.

T3 annotation. We adopt a human-in-the-loop approach for efficiency: we prompt GPT-5 to suggest candidate spans based on text, target, and fine-grained label. Annotators verify and edit suggestions, with only human-confirmed spans retained

in the final dataset.

Inter-annotator agreement between targets and rounds is shown in Appendix B. After removing posts that violate guidelines (missing targets, unavailable content, ambiguous cases), we obtain 9,386 fully annotated posts. We perform additional quality checks using GPT-5 API to flag potential errors, manually reviewing and correcting several hundred instances to produce the final dataset.

3.4 Data description

The TAMA dataset comprises 9,386 social media posts annotated with a multi-level hierarchical labeling scheme supporting three complementary tasks. As illustrated in Figure 2, T1 focuses on target detection, while T2 and T3 provide different annotation perspectives on the targeted-abusive content identified in T1, with T3 serving as a complementary annotation to T2.

The hierarchical structure ensures that T2 and T3 annotations both correspond to the same set of targeted-abusive instances from T1, maintaining data consistency across all three tasks. Each of the 3,267 targeted-abusive samples receives annotations from both T2 (abuse type classification) and T3 (complementary annotations), enabling multi-dimensional analysis of abusive content.

The T2 distribution exhibits notable class imbalance, with two dominant categories (general abuse and attacks on credibility) accounting for 75.5% of all targeted-abusive content. Conversely, specialized abuse types such as religious discrimination, sexual assault, and physical harm represent less than 2% each, reflecting their relatively lower prevalence in the dataset. This imbalance mirrors real-world patterns in online abuse, where generic insults and credibility attacks are more common than specific threat categories (Vogels, 2021).

4 Cascaded Conditional MTL Framework

The overall Cascaded-MTL framework is shown in Figure 3.

4.1 Problem Formulation and Notation

For each example we observe a post x and its designated public figure (anchor target) a (e.g., an official handle). We construct an input sequence $s =$ [TGT] a [/TGT] x, where `[TGT]` and `[/TGT]` are special tokens marking the target span.

T1 assigns a label $y^{\text{tgt}} \in \mathcal{Y}^{\text{tgt}}$, where $\mathcal{Y}^{\text{tgt}}$ are labels in T1. For posts with $y^{\text{tgt}} =$ *targeted-abusive*, T2 predicts a type label $y^{\text{type}} \in \mathcal{Y}^{\text{type}}$, where $\mathcal{Y}^{\text{type}}$ are labels in T2, and T3 predicts token-level span labels $y^{\text{loc}} \in \{0,1\}^L$ for a tokenized sequence of length L. By construction, y^{type} and y^{loc} are undefined for non-abusive or unidentified-targets posts.

We denote by d the hidden dimensionality of the encoder and by d_c the dimensionality of the projected T1 summary vector used in CTF. We use $\odot$ for element-wise multiplication and $\oplus$ for vector concatenation. Standard multi-class cross-entropy and token-wise binary cross-entropy losses are denoted by $\text{CE}(\cdot)$ and $\text{BCE}(\cdot)$ respectively.

4.2 Base Multi-Task Architecture

Shared encoder. We encode s with a multilingual Transformer encoder f_θ, obtaining token representations and a pooled sentence vector:

$$H = f_\theta(s) \in \mathbb{R}^{L\times d}, \quad h_{\text{cls}} = \text{Pool}(H) \in \mathbb{R}^d, \tag{1}$$

where $H = [h_1, \ldots, h_L]$ and $\text{Pool}(\cdot)$ is mean pooling of the sentence representation. We truncate or pad inputs to $L = 128$ tokens and maintain offset mappings between tokens and characters to supervise spans.

Target detection head (T1). T1 is a standard 3-way classifier over $\mathcal{Y}^{\text{tgt}}$:

$$z^{\text{tgt}} = W^{\text{tgt}} h_{\text{cls}} + b^{\text{tgt}}, p^{\text{tgt}} = \text{softmax}(z^{\text{tgt}}), \tag{2}$$

with parameters $(W^{\text{tgt}}, b^{\text{tgt}})$. We optimize the cross-entropy loss

$$\mathcal{L}_{\text{tgt}} = \text{CE}\big(p^{\text{tgt}}, y^{\text{tgt}}\big) \tag{3}$$

on all instances.

Fine-grained type head (T2). T2 predicts a distribution over 12 abuse types for posts that are *targeted-abusive* according to T1. Let h^{type} denote the input representation to the T2 classifier. In the base model (without conditioning), $h^{\text{type}} = h_{\text{cls}}$. Conditional variants replace h^{type} as described in Section 4.3. We compute

$$z^{\text{type}} = W^{\text{type}} h^{\text{type}} + b^{\text{type}}, p^{\text{type}} = \text{softmax}(z^{\text{type}}), \tag{4}$$

and train with a class-weighted cross-entropy loss $\mathcal{L}_{\text{type}}$, where type-specific weights mitigate label imbalance. Only examples with $y^{\text{tgt}} =$ *targeted-abusive* contribute to $\mathcal{L}_{\text{type}}$.

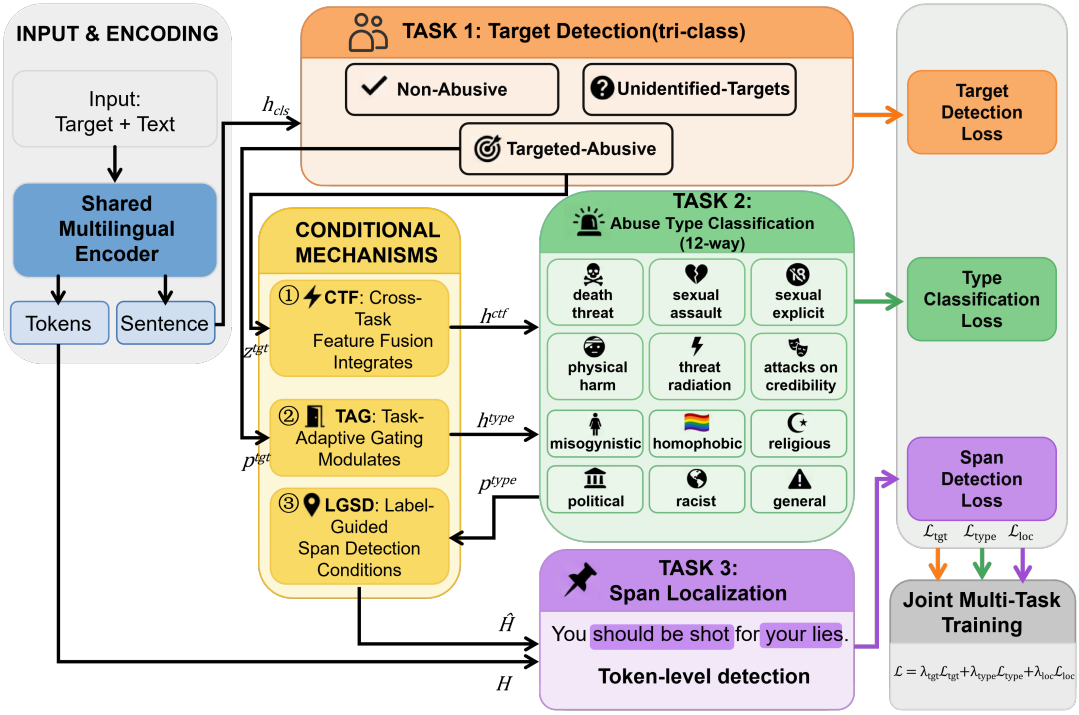

Figure 3: The overall framework of Cascaded-MTL.

Span localization head (T3). T3 is a token-level binary classifier. Given token representations $\hat{H} \in \mathbb{R}^{L\times d}$. In the base model (without conditioning), $\hat{H} = H$. Conditional variants replace $\hat{H}$ as described in Section 4.3. We compute a score for each token:

$$S = \hat{H}\, w^{\text{loc}} + b^{\text{loc}} \in \mathbb{R}^{L}, \quad p^{\text{loc}} = \sigma(S) \in \mathbb{R}^{L}, \tag{5}$$

where $w^{\text{loc}} \in \mathbb{R}^{d}$ and $b^{\text{loc}} \in \mathbb{R}$, and σ is the element-wise sigmoid. The span loss is a token-wise binary cross-entropy between p^{loc} and y^{loc}, computed over all posts, with padded positions masked out. For posts with $y^{\text{tgt}} \neq$ *targeted-abusive*, we treat y^{loc} as an empty span (all-zero token labels) to provide additional negative supervision and reduce spurious span predictions.

4.3 Conditional Mechanisms for Task Interaction

The three tasks in TAMA describe the same underlying phenomenon from complementary views: T1 establishes whether abuse is on-target, T2 characterizes the semantic intent of targeted abuse, and T3 identifies the textual evidence that supports these judgments.

Naive multi-task learning shares parameters but leaves the interaction implicit, which can lead to gradient interference (e.g., global abusiveness cues dominating rare type cues) and brittle token-level evidence. We therefore introduce three lightweight conditioning operators that explicitly shape representation learning.

4.3.1 Cross-Task Feature Fusion (CTF)

CTF introduces an explicit cross-task channel by compressing the upstream decision evidence into a compact vector and fusing it with the shared sentence representation:

$$c^{\text{tgt}} = W_{\text{proj}} z^{\text{tgt}} \in \mathbb{R}^{d_c}, \tag{6}$$

where $W_{\text{proj}} \in \mathbb{R}^{d_c\times 3}$ and d_c is the dimensionality of the projected T1 summary vector. The fused representation is

$$h^{\text{ctf}} = h_{\text{cls}} \oplus c^{\text{tgt}} \in \mathbb{R}^{d+d_c}. \tag{7}$$

4.3.2 Task-Adaptive Gating (TAG)

TAG uses T1 probabilities as a *soft control signal* to adapt the contribution of h_{cls}:

$$g = \sigma\big(W_{\text{gate}}\, p^{\text{tgt}}\big) \in \mathbb{R}^{d}, \tag{8}$$

where $W_{\text{gate}} \in \mathbb{R}^{d\times 3}$. We obtain a gated sentence representation:

$$\tilde{h}_{\text{cls}} = h_{\text{cls}} \odot g \in \mathbb{R}^{d}. \tag{9}$$

The final T2 input is then

$$h^{\text{type}} = \tilde{h}_{\text{cls}} \in \mathbb{R}^d. \tag{10}$$

4.3.3 Label-Guided Span Detection (LGSD)

Different abuse types rely on distinct lexical and syntactic cues (e.g., explicit threat verbs vs. identity slurs). LGSD lets T2 guide T3 by conditioning token-level span predictions on the inferred abuse-type distribution.

Given $p^{\text{type}} = \text{softmax}(z^{\text{type}})$, we compute a type-aware vector:

$$u = \tanh\big(W^{\text{mod}}\, p^{\text{type}}\big) \in \mathbb{R}^d, \tag{11}$$

with $W^{\text{mod}} \in \mathbb{R}^{d\times 12}$. We then broadcast u across tokens and obtain

$$\hat{H} = H \odot u \in \mathbb{R}^{L\times d}, \tag{12}$$

which is fed into the span head described above. For example, if p^{type} places high probs on *death_threat*, LGSD encourages the span classifier to focus on tokens associated with threats and violent language, while down-weighting generic profanity that might be less diagnostic for this type. Because LGSD uses the full distribution rather than an argmax label, it remains robust when T2 is uncertain or multiple abuse types are partially activated.

4.4 Training Objective and Inference

Joint objective. The overall loss for a mini-batch is a weighted sum of the three task-specific losses:

$$\mathcal{L} = \lambda_{\text{tgt}}\,\mathcal{L}_{\text{tgt}} + \lambda_{\text{type}}\,\mathcal{L}_{\text{type}} + \lambda_{\text{loc}}\,\mathcal{L}_{\text{loc}}, \tag{13}$$

where $\lambda_{\text{tgt}}, \lambda_{\text{type}}, \lambda_{\text{loc}} \geq 0$ control the relative importance of each task. Unless otherwise stated, we set $\lambda_{\text{tgt}} = 1.2$ and $\lambda_{\text{type}} = \lambda_{\text{loc}} = 1.0$, chosen on the development set to balance T1 robustness with downstream type and span accuracy. All parameters of the encoder and heads, including CTF, TAG, and LGSD modules, are optimized jointly.

Inference. At inference time, the model operates in a cascaded manner:

1. Run the encoder and T1 head to obtain p^{tgt} and predict $\hat{y}^{\text{tgt}} = \arg\max p^{\text{tgt}}$.
2. If $\hat{y}^{\text{tgt}} \neq$ *targeted-abusive*, we output *non-abusive* or *unidentified-targets* and skip T2/T3.
3. If $\hat{y}^{\text{tgt}} =$ *targeted-abusive*, we compute T2 and T3 predictions using the conditioned representations: $\hat{y}^{\text{type}} = \arg\max p^{\text{type}}$ and span scores p^{loc}. Spans are extracted by thresholding p^{loc} and merging contiguous positive tokens into character-level phrases.

5 Results

Table 2 reports the overall performance of Cascaded-MTL across three multilingual encoders, including both single-task and multi-task baselines as well as conditional variants. Our findings suggest that Cascaded-MTL yields consistent gains in overall task performance across backbones, as reflected by `Avg_F1`.

On `multilingual-e5-base` backbone, multi-task learning already improves substantially over independent fine-tuning: `MTL-Base` increases `Avg_F1` from 63.00 to 65.98. Incorporating conditional modules further strengthens the joint solution, and the full configuration `+CTF+TAG+LGSD` achieves the best overall score (`Avg_F1` $= 68.25$), with strong gains on type classification and span localization.

The same trend holds when switching to other encoders. On `mDeBERTa-v3-base`, `MTL-Base` slightly improves over `Single_Task` (`Avg_F1`: $62.57 \rightarrow 62.89$), while Cascaded-MTL variants provide larger improvements, reaching 65.07 with `+CTF+TAG+LGSD`. On `XLM-RoBERTa-base`, Cascaded-MTL again improves the overall average from 60.00 (`Single_Task`) and 62.84 (`MTL-Base`) to 65.09 (`+CTF+TAG+LGSD`). These consistent improvements across heterogeneous pretraining objectives and model families support the model-agnostic nature of Cascaded-MTL.

6 Analysis

Cascaded-MTL is tailored to TAMA's hierarchical supervision, where target awareness (T1), abuse intent (T2), and textual evidence (T3) describe the same phenomenon at different granularities.

Cascaded-MTL consistently improves the joint metric across backbones, indicating a portable inductive bias rather than encoder-specific gains. In Table 2, the full configuration `+CTF+TAG+LGSD` yields the best `Avg_F1` on all three encoders, improving over `MTL-Base` by $+2.27$ (`multilingual-e5-base`: $65.98 \rightarrow 68.25$), $+2.18$ (`mDeBERTa-v3-base`: $62.89 \rightarrow 65.07$), and $+2.25$ (`XLM-RoBERTa-base`: $62.84 \rightarrow 65.09$). The

Method	T1_Acc	T1_F1	T2_F1	T3_F1	Avg_F1
multilingual-e5-base					
Single_Task	83.29	69.72	48.74	70.55	63.00
MTL-Base	85.35	71.90	53.86	72.19	65.98
+ CTF	85.35	73.46	51.52	75.11	66.70
+ CTF + TAG	84.45	73.15	50.21	78.10	<u>67.15</u>
+ CTF + TAG + LGSD	83.80	70.90	55.88	77.97	**68.25**
mDeBERTa-v3-base					
Single_Task	85.08	70.19	44.55	72.96	62.57
MTL-Base	83.16	69.67	48.08	70.93	62.89
+ CTF	84.06	70.44	45.15	76.91	64.17
+ CTF + TAG	84.32	70.39	46.63	76.78	<u>64.60</u>
+ CTF + TAG + LGSD	83.93	72.42	46.40	76.40	**65.07**
XLM-RoBERTa-base					
Single_Task	81.49	70.55	39.52	69.92	60.00
MTL-Base	81.88	68.85	49.06	70.62	62.84
+ CTF	84.19	70.45	45.16	75.98	63.86
+ CTF + TAG	82.26	68.39	47.24	76.95	<u>64.19</u>
+ CTF + TAG + LGSD	83.55	68.59	50.44	76.24	**65.09**

Table 2: Performance comparison (%) and ablation between different backbones with Cascaded-MTL. 'Single_Task' denotes the model is fine-tuned on each task independently without task interaction. 'MTL-Base' is the Cascaded-MTL framework without any conditional mechanisms. `Avg_F1` is the mean of `T1_F1`, `T2_F1`, and `T3_F1`. **Bold** and <u>underline</u> denote the best and the second best average F1, respectively.

per-task changes vary by backbone, but the overall improvement is stable, suggesting the method mainly reshapes how the three supervision signals cooperate.

The largest and most reliable gains appear on span localization, which is the most structurally constrained objective in TAMA. Across backbones, conditioning substantially increases `T3_F1` compared to `MTL-Base` (e.g., $72.19 \rightarrow 77.97$, $70.93 \rightarrow 76.40$, $70.62 \rightarrow 76.24$). This pattern is consistent with T3 being sensitive to higher-level semantics: without explicit coordination, token tagging can drift toward generic negativity, while cascading encourages spans to align with an on-target hypothesis and a coherent type interpretation.

Relative to standard multi-task learning, Cascaded-MTL makes cross-task interaction explicit, which stabilizes learning under sparsity and imbalance. `MTL-Base` already improves over `Single_Task` on `Avg_F1`, but the gain can be modest (notably on `mDeBERTa-v3-base`: $62.57 \rightarrow 62.89$), reflecting that implicit parameter sharing does not always translate into better coordination between dense T1 supervision, long-tailed T2 labels, and token-level T3 evidence. By conditioning downstream representations on model beliefs (p^{tgt} and p^{type}), Cascaded-MTL reduces over-confident downstream activation when upstream signals are ambiguous and strengthens downstream signals when upstream confidence is high, improving the overall operating point.

Ablations show complementary contributions: each link improves a different part of the triple, and the full cascade yields the best trade-off. On `multilingual-e5-base`, `+CTF` improves `T1_F1` and `T3_F1`, `+CTF+TAG` yields the strongest `T3_F1` (78.10), and adding `LGSD` is where `T2_F1` increases to its best value (55.88) while maintaining high `T3_F1`, producing the best `Avg_F1`. Similar "best overall from composition" behavior holds on the other backbones, supporting the view that Cascaded-MTL improves performance by enforcing cross-task consistency rather than optimizing tasks in isolation.

7 Conclusion

We introduced **TAMA**, a target-aware multilingual abuse benchmark for public figures with aligned supervision for target detection, abuse type classification, and phrase-level spans localization. We also proposed **Cascaded-MTL**, a lightweight conditional multi-task framework that exploits these task dependencies, and show consistent `Avg_F1` improvements across three multilingual encoders.

Limitations

We acknowledge the following limitations in this paper: (i) TAMA is constructed from X (Twit-

ter) posts directed at public figures. While this focus matches high-impact moderation scenarios, the data may not fully reflect other platforms (e.g., long-form comments, multimodal posts) or richer conversational context (threads, reply chains), where targeting and intent can depend on discourse history. (ii) The benchmark centers on five prominent public figures. Although they span different regions and languages, the target set is small relative to the diversity of public figures and sociopolitical contexts worldwide. Models trained on TAMA may therefore underperform when transferred to unseen targets, emerging events, or culturally specific abuse phenomena not represented in the dataset. (iii) The fine-grained type distribution is highly imbalanced, with a few common categories dominating and several rare types having very limited support. This makes reliable estimation for low-frequency categories difficult and may bias both learning and evaluation toward frequent abuse patterns. (iv) Cascaded-MTL explicitly links tasks via conditional mechanisms. Although we observe consistent improvements, errors or miscalibration in upstream predictions can still affect downstream behavior (e.g., type or span quality under ambiguous targeting). Improving calibration and robustness under upstream uncertainty remains an important direction.

Ethical Considerations

This work studies abusive language and may include offensive content; we limit verbatim examples and encourage cautious use. Although our benchmark is built from publicly available posts, they may still be sensitive, so we follow data-minimization and recommend platform-compliant release (e.g., sharing post IDs rather than redistributing full text where applicable) and honoring deletions/takedowns. Because abuse labeling is subjective and multilingual norms vary, we encourage annotator safeguards and transparent reporting of limitations and bias. Finally, target-aware abuse detection has safety benefits but also dual-use risks (harassment, surveillance, censorship); we recommend human-in-the-loop deployment and clear documentation consistent with the ACL Code of Ethics.

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A Experimental Setup

Tasks and metrics. For T1 target detection, we report overall accuracy and macro-averaged F1 over the 3-way label set (`T1_Acc` and `T1_F1`). For T2 fine-grained abuse type classification, we report macro F1 over the 12 abuse types (`T2_F1`), computed only on *targeted-abusive* posts. For T3 phrase-level span localization, character-level spans are mapped to token-level labels and we report macro F1 over span labels (`T3_F1`). All results are reported on the held-out test split of the final cleaned dataset, with a train/val/test split ratio 8:1:1.

Backbones. In order to evaluate the robustness of Cascaded-MTL, three widely used encoder-only Transformer classifiers are evaluated, including: `multilingual-e5-base` (Wang et al., 2024), `XLM-RoBERTa-base` (Conneau et al., 2020) and `mDeBERTa-v3-base` (He et al., 2023).

Configurations. Inputs are truncated/padded to a maximum length of 128. We train with learning rate 2×10^{-5}, batch size 16, and 30 epochs. At the end of each epoch, we run validation and update the saved best checkpoint when development performance improves; final results are reported on the test set using the best development checkpoint.

B Cohen's kappa by target and annotation rounds

Table 3 shows a monotonic and substantial improvement in inter-annotator agreement across rounds (average κ: 0.2751 $\rightarrow$ 0.5480 $\rightarrow$ 0.7096), indicating that iterative calibration and guideline refinement effectively reduced ambiguity and stabilized labeling decisions. We also observe large target-dependent variance in Round 1 (0.1343–0.3769), which shrinks markedly in the final round (0.6637–0.7631), suggesting that the finalized guidelines generalize across different public figures and language contexts.

Target	Round 1	Round 2	Final
Theresa May	0.2161	0.5201	0.7631
Liz Truss	0.3548	0.4372	0.6699
Maria Ressa	0.3769	0.5938	0.7277
Yulia Navalnaya	0.2933	0.6350	0.6637
Vladimir Soloviev	0.1343	0.5537	0.7235
Average	0.2751	0.5480	0.7096

Table 3: Inter-annotator agreement (Cohen's kappa) by target and annotation rounds.

C Annotation guidelines and definitions for T1

The detailed annotation guidelines and label definitions for T1 as shown in Table 4.

D Annotation guidelines and definitions for T2

We followed the abuse definitions from previous work by Posetti et al. (2023). The detailed annotation guidelines and label definitions for T2 as shown in Table 5.

E Benchmarking LLMs on TAMA

E.1 zero-shot prompting LLMs

We first evaluate zero-shot prompting to assess how well instruction-tuned LLMs handle TAMA without task-specific training. We test `Qwen2-7B-Instruct` (qwe, 2024), `Phi-3-mini-128k-instruct` (Abdin et al., 2024), and `Meta-Llama3-8B-Instruct` (AI@Meta, 2024) on the TAMA test set. For cross-lingual consistency, we use a single English prompt template while keeping the original (potentially multilingual) post text as input.

Configurations. All subtasks are formulated as closed-set generation with strict outputs and deterministic decoding (greedy; temperature $= 0$). For T1, the input includes the post text and the designated target handle (with an optional target profile for disambiguation), and the model outputs label only. The detail prompt template of T1 is shown in Table 7. For T2 and T3, we follow the dataset dependency and evaluate only on instances whose gold T1 label is *targeted-abusive*: T2 outputs a single label, and T3 outputs only a JSON list of abusive phrases copied verbatim from the input. The detail prompt templates of T2 and T3 are shown in Table 8 and Table 9, respectively. To reduce format drift, we constrain decoding for T1/T2 to valid label ID outputs.

Results. Table 6 reports zero-shot prompting results on three instruction-tuned LLMs. A clear pattern emerges: while LLMs can localize salient offensive phrases reasonably well (T3_F1 ranges from 64.86–71.12), they struggle to produce the structured, target-grounded decisions required by TAMA, especially for fine-grained type attribution (T2_F1 ranges from 5.48–18.79). This mismatch reflects the hierarchical nature of TAMA (target $\rightarrow$

Label	Definition	Guidelines
non-abusive	The post does not contain abusive language.	Includes neutral/supportive content or legitimate criticism without abusive expressions.
targeted-abusive	The post contains abusive language **directed at the designated target** (the public figure of the post–target pair).	The abusive expression is aimed at the target (e.g., insults, threats, degrading language), regardless of whether other entities are mentioned. This label triggers T2 (abuse type) and T3 (span localization).
unidentified-targets	The post contains abusive language, but the abuse is **not directed at the designated target**; instead it targets other entities or the intended target cannot be reliably identified as the designated public figure.	Use this label when abuse is aimed at another person/group/institution, or when the post contains abuse but does not clearly target the designated figure.

Table 4: T1 label definitions for targeted abuse detection.

Label	Definition
death_threat	A threat suggesting the target will be killed or should die.
sexual_assault	A threat suggesting the target will be, or deserves to be, sexually assaulted.
sexual_explicit	Sexually explicit language or content involving sexual acts (including references to anatomy or suggestive sexual content).
physical_harm	A threat suggesting the target will suffer other forms of physical harm, or language that incites violence against the target.
radiation_of_threats	Threats or abuse that extend beyond the target and endanger people close to them (e.g., children, parents, partners, siblings).
attacks_on_credibility	Language implying the target is unfit for their role, cannot be trusted, or insulting their intelligence/mental capacity with the aim of damaging professional reputation.
misogynistic	Belittling or degrading language toward women, or language that incites hatred toward women.
homophobic	Language expressing homophobia.
religious	Language attacking a person's religion or derogating their faith (including cases involving false assumptions about faith).
political_sectarian	Language attacking perceived political affiliations or political/sectarian philosophies.
racist	Language expressing racism.
general	Other personal insults (e.g., mild swearing or slurs) that do not fall into the more specific categories above.

Table 5: T2 label definitions for fine-grained abuse type classification.

type → span): span extraction can often be approximated by highlighting locally toxic expressions, but reliable moderation requires first resolving whether the abuse is directed at the designated public figure (T1) and then mapping the intent to a strict 12-way taxonomy (T2), which is sensitive to label semantics, multilingual variation, and long-tailed type frequencies.

Model	T1_Acc	T1_F1	T2_F1	T3_F1	Avg_F1
Qwen2	48.48	41.95	18.34	66.51	42.27
Phi3	52.98	40.23	18.79	64.86	41.29
Llama3	74.99	49.79	5.48	71.12	42.13

Table 6: Zero-shot performance between different LLMs with TAMA.

Consequently, the overall Avg_F1 of zero-shot LLMs clusters around 41–42 despite their comparatively strong T3, indicating that free-form generation does not translate into globally consistent tri-task outputs. In contrast, Cascaded-MTL explicitly aligns learning with this hierarchy by converting upstream beliefs into continuous conditioning signals (CTF/TAG/LGSD), thereby coupling global target awareness and semantic type hypotheses with evidence extraction. This dependency-aware inductive bias yields substantially higher and more stable joint performance under fine-tuning across backbones (Table 2), demonstrating that explicit task-dependency modeling is crucial for target-aware multilingual abuse moderation beyond what zero-shot prompting can offer.

E.2 Fine-tuning LLMs

We also fine-tune the above three LLMs on TAMA to evaluate their performance by using the same train/dev/test split as described in Section A. All tasks are trained with answer-only supervision, and the loss is computed only on the answer tokens by masking the prompt tokens. T1 is trained on the full split and predicts a single ID, the detail of T1 fine-tune prompt template is shown in Table 11. Following the dataset dependency, T2 and T3 are trained and evaluated only on instances whose

System

```
You are a content review expert. Given a text and a specific @Twitter account (the target), determine
whether the text contains hate speech/abusive language and whether it is directed at that target.
You will also be given a brief profile of the target account. Use the target profile ONLY to:
- resolve coreference (e.g., "she/he/they", "your father", role/title),
- disambiguate which person/account is being referred to,
- understand context about the target (public role, identity, etc.).
Do NOT use the profile to assume abuse when the text itself is not abusive.
Choose exactly ONE of the following three classes, and output ONLY its ID:
- 0 = unidentified-targets (hate speech/abusive language present but NOT directed at the given target)
- 1 = targeted-abusive (hate speech/abusive language directed at the given target)
- 2 = non-abusive (no hate speech/abusive language)
Important:
- Even if multiple accounts are mentioned, judge targeting ONLY with respect to the given target
account.
- Output ONLY one character: 0 or 1 or 2. No explanation.
```

User

```
Target account: {TARGET_HANDLE}
Target profile: {TARGET_PROFILE}
Text:"{POST_TEXT}"
```

Table 7: Zero-shot prompt template for T1. {TARGET_HANDLE} denotes the designated target account, {TARGET_PROFILE} denotes the optional target profile (when available), and {POST_TEXT} denotes the input post text.

gold T1 label is *targeted-abusive*: T2 predicts one label ID, and T3 predicts a JSON array of abusive phrases constructed from gold span annotations. The detail of T2 and T3 fine-tune prompt templates are shown in Table 12 and Table 13.

Model	T1_Acc	T1_F1	T2_F1	T3_F1	Avg_F1
Qwen2	86.11	73.95	45.32	79.63	66.30
Phi3	78.79	53.51	22.19	56.80	44.17
Llama3	87.40	76.58	45.47	77.99	66.68

Table 10: Performance comparison between fine-tuning different LLMs with TAMA.

Configurations. We use LoRA with r=32, α=16, and dropout 0.05 on the projection modules. We train for 10 epochs with learning rate 2×10^{-5}, per-device batch size 1 and gradient accumulation 8. The maximum sequence length is 256 for T1/T2 and 512 for T3. We select the best checkpoint by dev macro F1 at epoch end and evaluate it on the test set. At inference time, we set `max_new_tokens=8` for T1/T2 (label ID outputs) and 256 for T3.

Results. Table 10 shows that supervised fine-tuning substantially strengthens LLMs on TAMA, but the gains are uneven across tasks, revealing a clear gap between learning what to flag and learning why/what type it is. After fine-tuning, Qwen2 and Llama3 achieve strong targeted-abuse detection and evidence extraction (e.g., T1_F1 = 73.95/76.58 and T3_F1 = 79.63/77.99), suggesting that with sufficient labeled supervision, LLMs can internalize the anchor-target setup and recover salient abusive phrases. However, fine-grained type classification remains the bottleneck: T2_F1 stays markedly lower (45.32/45.47 for Qwen2/Llama3 and only 22.19 for Phi3), which in turn limits overall Avg_F1—especially for smaller models. This pattern is consistent with TAMA's long-tailed, multilingual type space, where reliable type discrimination requires separating subtle semantic cues (e.g., credibility attacks vs. general abuse) rather than merely detecting negativity.

In contrast, Cascaded-MTL is explicitly designed to exploit TAMA's hierarchy by turning upstream beliefs into conditioning signals that constrain downstream predictions, promoting cross-task consistency between target awareness, type semantics, and span evidence. As a result, Cascaded-MTL is less prone to the common fine-tuned-LLM failure mode of producing plausible spans that are weakly aligned with the predicted type, and it offers a more reliable joint operating point for moderation scenarios that require coherent target–type–evidence outputs rather than strong single-task performance in isolation.

System

```
You are a classification expert.
The input text is already confirmed to be targeted-abusive.
Your job is to choose exactly ONE fine-grained hate/abuse category ID.
Choose exactly ONE ID from this closed set:
0 = death_threat
1 = sexual_assault
2 = sexual_explicit
3 = physical_harm
4 = radiation_of_threats
5 = attacks_on_credibility
6 = misogynistic
7 = homophobic
8 = religious
9 = political_sectarian
10 = racist
11 = general
Output ONLY the ID (an integer from 0 to 11). No explanation, no extra text.
```

User

```
Text:
"{POST_TEXT}"
```

Table 8: Zero-shot prompt template for T2. {POST_TEXT} denotes the input post text.

System

```
You are a content review expert.
Task:
Extract all hateful/abusive phrases from the given text.
Output format:
Return ONLY a JSON array (list) of strings, e.g.:
["phrase1", "phrase2"]
Rules:
- Each phrase MUST appear verbatim in the input text (copy exact substrings).
- If there is no hateful phrase, output [].
- Output ONLY the JSON array. No explanation, no extra text.
```

User

```
Text:
"{POST_TEXT}"
```

Table 9: Zero-shot prompt template for T3. {POST_TEXT} denotes the input post text.

System

```
You are a content review expert.
Task: Given a target and a text, output ONLY the tri-class ID:
0 = unidentified-targets
1 = targeted-abusive
2 = non-abusive
Output ONLY one character: 0 or 1 or 2. No explanation.
```

User

```
Text: {POST_TEXT}
Target: {TARGET}
Answer:{TRI_ID}
```

Table 11: Fine-tuning prompt template for T1. {TARGET} denotes the designated target account, and {POST_TEXT} denotes the input post text. {TRI_ID} is the tri-class ID.

System

```
You are a content review expert.
Task: Given a text confirmed to be targeted abusive. output ONLY the fine-grained category ID.
Choose exactly ONE ID from this closed set:
0 = death_threat
1 = sexual_assault
2 = sexual_explicit
3 = physical_harm
4 = radiation_of_threats
5 = attacks_on_credibility
6 = misogynistic
7 = homophobic
8 = religious
9 = political_sectarian
10 = racist
11 = general
Output ONLY the ID (0-11). No explanation.
```

User

```
Text: {POST_TEXT}
Answer:{FINE_ID}
```

Table 12: Fine-tuning prompt template for T2. {POST_TEXT} denotes the input post text. {FINE_ID} is the fine-grained category ID.

System

```
You are a content review expert.
Task: Extract all hateful/abusive phrases from the text.
Output ONLY a JSON array (list) of strings, e.g.:
["phrase1", "phrase2"]
Rules:
- Each phrase MUST appear verbatim in the text.
- If none, output [].
```

User

```
Text: {POST_TEXT}
Answer:
{JSON_PHRASE_LIST}
```

Table 13: Fine-tuning prompt template for T3. {POST_TEXT} denotes the input post text. {JSON_PHRASE_LIST} is the output JSON list include all abuse span.