

Exploring the Relationship Between Game Content and Culture-based Toxicity

A Case Study of League of Legends and MENA Players

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ABSTRACT

We examine culture- and racial-based toxicity and hate speech in player communities and explore how this toxicity might be informed and affected by the design of the game elements and content. To illustrate these effects, we used a mixed method approach to analyze the experiences of players from the Middle East and North Africa (MENA) regions within the League of Legends (LoL) community as a case study. By qualitatively and quantitatively analyzing more than 2 million lines of in-game chats from 30,000 game sessions on 2 LoL servers and also 89 forum discussions containing hundreds of lines of text, we find that despite the world and characters of LoL being fictional, they are recognized by the player base as having connections to the real-world cultures and, accordingly, they affect the way that players communicate. We provide specific examples of both negative and positive inspirations to elaborate on how the design of certain regions and characters affects the way that the MENA players and issues are received or addressed. Additional analysis of in-game chat data describes other topics where toxic behavior emerges and how these topics correlate.

KEYWORDS

Online toxicity; Gaming culture; League of Legends; Middle East

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1 Introduction

In this study, we examine how racist and cultural hate speech and related disruptive language emerges in and around online video games and investigate whether and how they relate to the design elements and content of the game. We approach these research aims through a specific case study of the experiences of players from the Middle East and North Africa (MENA) regions in the *League of Legends* (LoL) in-game and community chat [7].

For analysis, we have constructed a mixed methods qualitative and quantitative approach. We perform (1) quantitative analysis on data that consists of chatlogs from 60,000k random in-game matches; (2) qualitative analysis on chatlogs of 200 randomly picked matches; and (3) code 89 discussion threads from the official LoL forums.

Although LoL takes place in a fictional universe that has no explicit relationship to the real world, our results indicate that players can recognize and associate the design clues of characters and locations in the game world with real-world contexts. Accordingly, certain design decisions, characters, or locations can become flagbearers for communication and toxicity between different communities in- and out-of-game. As a result, we argue that the designs of virtual worlds and characters do not exist in a vacuum and can affect the players that interact with the game, as well as how they communicate with each other.

2 Related literature

2.1 Online Toxicity

Online toxicity is defined as *rude, disrespectful, or unreasonable behavior that is likely to make one leave a discussion* [27]. In the online gaming context, this would mean a player leaving the game or turning the chat feature off. A fundamental question of online toxicity is whether online environments such as game chat rooms lend themselves *sui generis* to provocative and

harassing behavior. Khorasani [14] notes that in online communities, like their counterparts in actual social networks, participants “make friendships and argue with each other and become involved in long and tedious conflicts and controversies” (p. 2). Moule, Decker, & Pyrooz [21] observe, however, that online environments have created new forms of socialization and have introduced conflict in intra- and intergroup relations. In turn, Hardaker [8] argues that the relative anonymity provided in online exchanges “may encourage a sense of impunity and freedom from being held accountable for inappropriate online behaviour” (p. 215). In a similar vein, Chatzakou et al. [6] observe that because of the pseudo-anonymity of online platforms, people tend to express their viewpoints with less inhibition than they would in face-to-face interactions.

Previous research in toxic behavior within online gaming has focused on predicting and regulating players’ toxic behavior [15, 19], linguistic analysis of toxic communication between players [16], and perceptions of players facing cyberbullying and exclusion [1, 5]. For example, Adinolf and Turkay [1] analyzed player perceptions and coping strategies with toxic behaviors in e-sports games and Birk et al. [5] investigated the effects of social exclusion on play experience and hostile cognitions.

The emergence of online toxicity may have serious consequences for players’ well-being, both online and offline. Hollá [12] and Hollá and Kuricová [13] studied the impact of cyberbullying and found that 31% of the study population has been involved in some form of cyber aggression, that higher levels of physical and verbal aggression were observed in girls than in boys, and that an increased tolerance of cyberbullying correlates with increased values of aggression. Moule et al. [21], in their proposed theoretical model for understanding the cycle of gang violence, observe that internet-related technology can fuel conflict and contribute to collective violence in the physical world. They describe internet-related technologies as creating a “potent cauldron for collective violence” (p. 5).

The study of trolling behavior may help moderators and users identify early signs of online provocation and provide the means to block abusive users before the conflict escalates. Herring et al. [10], for example, identify specific trolling strategies and responses to trolling, which may aid group moderation and rule-making. They also argue that educating users about trolling is an important proactive measure in reducing toxic behavior. Khorasani [14], in turn, draws interesting correlations between controversies of current online chats and religious controversies of the past and discusses some common rhetorical strategies used in their unfolding. He detects (a) opening moves; (b) attacking moves; (c) defending moves, (d) counterattacks; (e) deflecting moves; (f) accusation moves related to violations of principles of communication; (g) neutral moves; and (i) using rhetorical and direct questions. A similar discussion is found in studies of the rhetoric and linguistic pragmatics of trolling by Hardaker [8], Mkonko [20], and Herring et al. [10].

Overall, the previous literature suggests that toxic behavior is a part of the everyday experience of online gamers. However, despite the many studies on toxicity, culture-specific toxic behavior has not previously been studied in detail. Such an

analysis is called for, as online games provide a potential hotbed for racial slurs, hate speech, and discrimination. Understanding the prevalence and nature of such activities in globally popular games is important, as the insights are potentially useful when developing means to reduce toxicity in these games.

2.2 Race, Ethnicity, and Religion in Games

Since in this research we focus specifically on culturally specific toxicity (i.e., hate speech toward the players from the MENA), we are also interested in exploring if the content of the video games contributes this kind of toxicity.

Racial and ethnic representations in video games and online virtual worlds have been subjected to various criticism and research within the last decade. For example, Williams et al. [33] found that racial representation in video games does not compare well to the US population. Leonard [18] and Nakamura [22] analyzed the phenomenon of the racialization of game elements in World of Warcraft as a popular virtual world. Leonard [17] scrutinized and criticized the representations of black identity in sports video games, and Aldama [2] did the same for virtual Latinx representations.

Previously, Šisler [31] explored the representation of Arab identity in video games and pointed out the prevalence of negative representations, especially in military simulations. Recently, Bezio [4] argues for the existence of anti-Islam and Islamophobic sentiments in the final installments of *Tomb Raider* franchise as a form of colonialist ideology. In the case of Arab identities, video game representations and narratives tend to amalgamate with religious issues and sentiments [32].

Our previous work has investigated the role of cultural toxicity in online gaming [30]. To create a complete picture, in this research, we investigate the emergence of both *negative* and *positive* cultural inspirations (e.g., heroes) in game discussions. Involving multiple methods of analysis, our goal is to contrast both the positive and negative aspects of culturally influenced interaction in the game in question.

3 Methodology

3.1 Research Context

League of Legends (LoL) regularly provides a useful testbed for online behavioral research, as it is one of the most-played video games of all time [26]. The game has a strong and vocal community both playing the game and consuming related content online (e.g., forums, YouTube, streaming, etc.). LoL is also a game with a substantial e-sports scene. However, as a game based on a highly competitive online play that tests players’ mental abilities [11], LoL “[ensures] toxicity as an inevitable by-product” [23].

For this research, the developer of LoL, Riot Games, supplied us with anonymized chat data from Europe Nordic & East (EUNE) and Europe West (EUW) servers. In cooperation with the developers, we surmised that these two servers would host the greatest number of players from the MENA, as there is no specific server for the region. Since EUNE and EUW servers are

geographically the closest to the region, they should provide the best ping (fastest connection speed) during play which would be desirable to players. Although there is an additional Turkish (TR) server, the game version that runs on it is localized (e.g., Turkish voiceovers and localized character designs) and thus only caters to the players who speak Turkish.

3.2 Data Collection

For analysis, we have isolated game sessions where at least one player was logged-in from one of the 17 MENA countries. Out of the isolated data, we have randomly selected 30k game sessions (matches) from EUNE and EUW servers each. Figure 1 shows an example of in-game chat in LoL.

It must be emphasized that, although logging in from a country-specific IP does not define any ethnicity or nationality, we surmise that there will be many players who are familiar with local cultures and discuss them.



Figure 1: Example of in-game chat of LoL¹

Although software to spoof IP information is available, we would not expect it to be used widely in this context because it would create lag issues that would impede gameplay. Since the game is not banned in any of these countries², the players would typically not have any reason to use an IP spoofing service.

For each server, this meant around 1 million chat lines for a total of two million. To analyze the data, we created a lexicon of 48 hateful and 10 friendly expressions and their variations and identified the matches where hateful and/or friendly chat took place. The lexicon was created qualitatively by reading a random selection of matches while identifying hateful and friendly expressions and can be found online³. Table 1 shows the frequency of the most common expressions in the whole dataset.

For further exploration, one researcher qualitatively analyzed 100 matches from each server by reading and coding the chat logs from a total of 200 matches that were randomly selected among those with at least one hateful expression.

Moreover, we searched the official Riot Games LoL forums to identify threads that concern players from the MENA region or topics regarding Middle Eastern cultures by a manual search of selected keywords (e.g., Arab, Middle East, North Africa, specific country names, etc.). As a result, 89 forum threads were identified from EUNE, EUW, and North American (NA) contexts. Although our game data did not include any insights from the NA region, we reasoned that for qualitative purposes, discussions from that server also had the potential to explain the inception and propagation of culture-based hate speech, considering that many members of the Middle Eastern diaspora live in North America. We read through all the discussions in these 89 forum threads and coded the content.

Table 1: TOP 7 hateful/friendly expressions in LOL chats from EUNE and EUW servers. Frequency is relative to other hateful/friendly expressions in the lexicon.

Expression	Occurrence	Frequency
<i>Hateful expressions</i>		
noob	13,669,004	26.2 %
fuck	7,546,548	14.5 %
stfu	3,810,928	7.3 %
idiot	3,438,006	6.6 %
noobs	2,705,776	5.2 %
fucking	2,503,765	4.8 %
suck	1,985,366	3.8 %
<i>Friendly expressions</i>		
pls	11,849,497	40.3 %
sry	7,648,067	26.0 %
sorry	4,936,922	16.8%
please	3,568,016	12.1 %
thanks	946,897	3.2%
trust me	158,156	0.5 %
thank you	148,923	0.5 %

4 Results

4.1 Qualitative Analysis of Forum Threads

Information about the forum threads is shown in Table 2. While this list of threads is not exhaustive, the amount of content was enough for rich analysis. Note that the official forums encapsulate a small segment of the online discussions about the game. Other sources, such as Reddit, also have rich discussions about the game. The number of messages provided in each thread is valid as of December 2018. Technically, the threads are still open, and more replies could be added in the future. Finally, the toxicity we identified in these forum posts was not in perfect sync with the lexicon we mobilized for quantitative analysis. Since the official LoL forums are moderated, hateful expressions

¹ <http://www.vvv-gaming.com/forum/topic/60087-possible-hacking-we-had-a-game-earlier-tonight-where-vvv-starman-had-his-chatting-controlled-by-the-other-team-screenshot-inside/>

² An interesting exception is the ban of female heroes in public tournaments in Iran.

³ <https://github.com/joolsa/toxicity-in-league-of-legends>

and cusswords can result in the banning of game accounts. As a result, words from the hateful lexicon were rarely used.

Table 2: Information about the analyzed forum threads on the Middle Eastern players from LoL official forums

Forum region	# of threads	Means (\bar{x}) and mid-ranges (R) of the numbers of messages per thread, and total (N) per server forum
NA	25	$\bar{x} = 17.64; R = 31.5; N = 441$
EUNE	34	$\bar{x} = 27.41; R = 69; N = 932$
EUW	30	$\bar{x} = 36.73; R = 114; N = 1,102$
Total	89	$\bar{x} = 27.81; R = 114; N = 2,475$

According to the mean number of messages per thread, richer discussions took place in the EUW server ($\bar{x} = 36.73$) with EUNE and NA servers following behind. This is not surprising, as the EUNE server is geographically closest to the Middle East.

Since our gameplay data does not illustrate the exact nationality or ethnicity of the players who logged in, we also took note when this information was self-expressed in messages. These results are shown in Table 3. 16 out of 17 countries were represented in the forum participation with the players from the United Arab Emirates (48%) being the most vocal (or more likely to express their nationalities), followed by Lebanon (11%) and Egypt (10.5%). Reading through all the forum posts, we identified and coded segments where the discussions focused on Middle Eastern cultures and Arabic-speaking players. The segments coalesced under three main categories and 6 sub-categories: (1) Arabic (a) language support and (b) server; (2) identifying content as (a) inspired by the Middle East, (b) inspired by other cultures, and (c) favorite of the players from the Middle East; and, finally, (3) an amalgamation of racism and/or Islamophobia. The occurrences of these codes per server are given in Table 4; in the following, we discuss the context for each code.

Arabic Language Support: Currently, *League of Legends* European Server in-game chat only supports the Basic Latin character set. (Turkish, Russian, Japanese, and Korean servers support the additional character sets of each specific language.) This feature presents a problem when the players want to chat in a language that has characters outside the standard Basic Latin, such as Arabic and Farsi, among others.

This is also a mixed issue for a game developer. On one hand, encouraging all players to speak one language (such as English) is beneficial since the game is based on team collaboration and requires the players on the same team to communicate effectively. For this reason, the developer may be reluctant to expand the language support. On the other hand, this does not stop players whose languages can easily be represented using the Basic Latin set (e.g., multiple European languages) from speaking their own language. This situation creates a perception of inequality. For example, one player⁴ states that: “I see a lot of [a]llowed languages in chat except Arabic, we need to allow

writing [A]rabic.” Another player notes: “it is of little help in forcing communication in [E]nglish! People speak [S]panish, [G]erman, [F]rench, [D]utch all the time!”

However, seven out of 20 (35%) coded instances are against Arabic language support. For example, one player notes: “How adding [A]rabic in the game will help you communicate with others? It MAY help you communicate with other [A]rabs but that’s it.” Another player agrees: “Ok, [I] am [an Arab] player but let me explain to you [one] thing. [It’s] really annoying when people speak their language in chat. Because the point of this game is communication. But if [R]ussians speak their language. And [P]olish. And [A]rab. Communication will be 0.” Another player underlines that it would draw more attention and hate toward the Arab players: “I’m an [A]rab player and I hate this idea, I see no reason in it, heck it’ll draw more hate, you’d type ‘GG’ they’ll read ‘I’ll bomb you.’”

The lack of language support forces Arabic speaking users to adopt a hybrid form of Arabic using Latin letters and numbers. This form is popularly called *Arabish* or *Arabizi*⁵ [34]. Arabizi has been identified as potentially detrimental to the literacy of Arabic speaking youth [3]; its use is popular in social media and chat applications that do not support Arabic characters.

Arabic Server: There is a strong sentiment among the community about the need for a local server. However, the definitions of the server among the users vary (e.g., Middle East Server, Arabic Server, African Server, etc.). One player states: “We really need this, as a member of the Arabian community, I don’t find many players of my culture and language.”

Users also agree that support for the Arabic language might make sense to a certain degree, since there is wide use of Arabic language in the MENA (albeit in different dialects with Gulf, Egyptian, and North African being the most distinct). However, an Arabic-focused server excludes Hebrew- and Farsi-speaking users among others. For example, a player from Israel states that: “I support opening a [M]iddle [E]astern server but as an Israeli I’d like to have the option to choose [A]rabic or [E]nglish.” Another player underlines: “Another problem [that will] surely arise is the amount of flaming in-game and in the forums resulted by the political and sectarian conflicts in the Middle East.” Here is a sequel comment that demonstrates the possible mentioned problems: “Middle [E]astern server, fine, but stop calling it an ‘Arab server’, no one is going to make a server for a race or religion or whatever, the servers are made for regions, and Arabs are not the only ones living in the [M]iddle [E]ast.”

Of course, there are practical reasons for a local server, namely decreasing lag and ping times. On this, two separate players note: “[...] producing an Arabian server would improve the ping and would create a strong community,” and “we deserve lower latency to play.”

⁴Since we used only one quote from each player/forum message and there are no replicate players, we do not anonymize players here.

⁵ A typical in-game Arabizi: “tyb yalla al3b 3ady b2a,” which translates to “بقي عادي اللعب يلا طيب” or “Ok, I’m still playing normal.”

Table 3: Self-expressed nationalities of the players in 89 forum threads

Forum region	Self-expressed*	Anonymous**	Distribution of nationalities (counts for the server; percentages for total)
NA	6	61	Egypt (1), Jordan (1), Saudi Arabia (1), United Arab Emirates (3)
EUNE	150	76	Algeria (1), Bahrain (4), Egypt (15), Iran (3), Iraq (1), Jordan (3), Kuwait (7), Lebanon (22), Oman (4), Palestine (2), Qatar (2), Saudi Arabia (4), Syria (3), United Arab Emirates (79)
EUW	46	56	Bahrain (3), Egypt (5), Iran (1), Jordan (4), Kuwait (3), Morocco (2), Oman (3), Qatar (3), Saudi Arabia (6), Syria (1), Tunisia (1), United Arab Emirates (14)
Total	200	193	Algeria (0.5%), Bahrain (3.5%), Egypt (10.5%) , Iran (2%), Iraq (0.5%), Jordan (4%), Kuwait (5%), Lebanon (11%) , Morocco (1%), Oman (3.5%), Palestine (1%), Qatar (2.5%), Saudi Arabia (5.5%), Syria (2%), Tunisia (0.5%), United Arab Emirates (48%)

* number of players who self-expressed their nationalities

** number of players who self-expressed they were from the MENA but did not specify a country

Table 4: Codes of discussions around the Middle East in 89 threads from the League of Legends official forums

Forum region	Total Codes	Arabic		Identifying content as			Racism and/or Islamophobia
		Language support	Server	Inspired by the Middle East	Inspired by other cultures	Favorite of the players from the Middle East	
NA (%)*	109	6 (30%)	9 (16%)	52 (49%)	19 (55%)	1 (33%)	22 (36%)
EUNE (%)*	77	2 (10%)	29 (51%)	24 (23%)	5 (14%)	2 (66%)	15 (25%)
EUW (%)*	96	12 (60%)	19 (33%)	30 (28%)	11 (31%)	0	24 (39%)
Total (% to the total)	282	20 (7.1%)	57 (20.2%)	106 (37.6%)	35 (12.4%)	3 (1.1%)	61 (21.6%)

* Percentage of the codes among servers

It is also possible to find comments that border between hate speech and trolling. Another study [9] defines the distinction and the commonalities between sarcasm/irony, trolling, and hate speech for the representations of African cultures in video games and notes that some messages “mobilize sarcasm or irony to the extreme that they might as well be thinly veiled racist comments.” In this context, an example would be a short message that only reads: “[Riot Games] doesn't want an [A]rab server, they are afraid it might go kaboom one day.” This innuendo is in-line with further trolling where Arab players are associated with LoL characters that use bombs or “blow themselves up.”

Identifying content as inspired by the Middle East:

Although the world of *League of Legends* is fictional, and it has no connection to the physical world, players regularly discuss cultural clues and inspirations behind the characters, costumes, and the game world. Some of this content is identified as inspired by the Middle East (see Table 5). Champions with dominantly positive inspirations include Nasus, Renekton, Azir, and Amumu (the first three resembling the ancient Egyptian gods Anubis, Sobek, and Horus respectively, and Amumu is a “cute” mummy). Malzahar and Taric both have mixed sentiments. Their names and some design clues seem to have been inspired by the MENA cultures; however, they are also mixed with other design elements. Malzahar’s design loosely resembles a genie wearing desert clothing (a mixture of Arabic and Persian daily robes that are two distinct cultural origins),

while Tariq is a flamboyant and flirtatious knight with a hammer. Zilean, Ziggs, and Kog’Maw only have negative inspirations and are mobilized in the “trolling” attempts against the players deemed to be Arab and/or Muslim. All three champions use bombs or bomb-like abilities, and Ziggs also can move himself using explosive charges, which some players compare to a suicide bomber.

Other positive sentiments include comments like “[it is time for a] champion that speaks [A]rabic.” In contrast, however, opposing players troll: “What’s next, [A]rabic [people] want burka for the female champions?” and “All female champs must wear black condoms (I honestly have no idea how that cloth is called), all male champs must wear beards, /dance command changed to /pray command, 5 times a day servers go offline for 20 minutes, new item in shop: jihad belt.” Of course, in reality, there is a range of popular fashions among the women living in the region ranging from the full-body burqa to Western milieus to unique MENA fashions.

Identifying content as inspired by other cultures:

Within the discussions where players point out ties between LoL designs and MENA inspirations, they also identify content with inspirations from other cultures. Highlights are characters inspired from Asian cultures (e.g., Lee Sin, Xin Zhao, Master Yi, Akali, Shen, etc.) and African cultures (e.g., Ryzee, Lucian), as well as champions inspired from global or local myths, stories, and legends such as werewolves, vampires, gargoyles, etc.

Table 5: Champions and world regions of LoL that are identified by players as inspired by the Middle East cultures

Content	Positive Inspirations	Negative Inspirations
Champion: Malzahar	<ul style="list-style-type: none"> “Isn't Malzahar inspired by [Arabs]? The clothes and the style, reminds heavily on it.” “Do you guys [Arabs] play Malzahar?” “He wears traditional ARABIAN [...] garbs on his default skin and his knife is of Arabian design & forging.” 	<ul style="list-style-type: none"> “Is it because he looks like a Muslim genie?? Also, has anybody ever heard of a North African before? You know, those African people who are Muslim.” “Because he's a prophet and in [A]merican culture the prophets are [all A]rab [M]uslim.” “Malzahar was released as Al'Zahar but some butthurt people complained that there was a guy with [a similar] name in the Hezbollah.” “I have never seen anyone call [Malzahar] a muslim or a terrorist.” “He came from a desert. Arabs love deserts.”
Champion: Nasus	<ul style="list-style-type: none"> “Malzahar, Nasus, and Renekton all have semitic origins or inspirations.” “Look at Nasus [...], true [E]gyptian” “Nasus (obviously, [be]cause he is freakin Anubis), Amumu (again obviously - a mummy, doh) and Renekton (A true aligator of Nile)” 	
Champion: Renekton	<ul style="list-style-type: none"> [Who are the Middle East inspired heroes?] “Taric, Malzahar, Renekton, Nasus, Zilean.” 	
Champion: Azir	<ul style="list-style-type: none"> “I know a person on my street that his name is Azir [...]. He is Arab.” “[Azir is a] sand mage” 	
Champion: Zilean		<ul style="list-style-type: none"> “I never played [Zilean], that's all. That comment is a bit racist don't you think though?” “Zilean is the only terrorist of this game” “Does that make Zilean a [M]uslim?” “Do [Arabs] like to play Zilean?” “Arabic version [of the game]- every champion is Zilean.” “So if Riot makes an Oriental Ziggs or Zilean skin and gives it for free to the [Middle East] server is this racism or a present?”
Champion: Taric	<ul style="list-style-type: none"> “Tariq (Arabic: طارق, Ṭāriq) (also spelled Taariq, Tarek, Tareq, Taric, Tarick, Tariq, or Tarik) is an Arabic male given name, common in the Middle East, Central Asia and South Asia.” “Taric's name most likely originates from the Arabian name 'طارق/Tariq', which means 'A person who hammers'.” 	<ul style="list-style-type: none"> “[Tariq] is deemed not only Arabic, but a Muslim as well. On 'man love Thursday' all the male champions hide.” [This is a derogatory reference to Tariq's look being flamboyant and a phenomenon called <i>Bacha Bazi</i>—abuse of underage male children in Afghanistan, also named in slang <i>manlove Thursday</i> by the foreign military members serving in the region.]
Champion: Ziggs		<ul style="list-style-type: none"> “I find it hilarious how [another player] is Arab and his main champ is Ziggs.” “ISIS will pick Ziggs, or maybe Draven (executioner)” “That being said, I vote Ziggs be disabled on the [A]rabic server.” “Everyone would want to play Ziggs on that [Middle Eastern] server and fight over him” “[Riot Games] release a [M]iddle [E]ast server and give them [M]uslim Ziggs for free”
Champion: Kog'Maw		<ul style="list-style-type: none"> “An [A]rab Kog skin for the server release would be funny. Something like 'Jihad Kog'Maw' or something.” “You guys [Arabs] like to play Kog'Maw KABOOM”
Champion: Amumu	<ul style="list-style-type: none"> [Who are the Middle East inspired heroes?] “Amumu? Although unsure about [the voice acting]” 	
Game-World Region: Shurima	<ul style="list-style-type: none"> “Our equivalent [to the Middle East] would be Shurima.” “Shurima, the Egypt parallel on Valoran, with pyramids, eldritch lore and all that [...]” 	<ul style="list-style-type: none"> “We mash together the myriad of [the M]iddle [E]astern and [S]outh [A]sian cultures into one giant wad of cultural ignorance” [This is a reference to the mixture of the Middle Eastern and Indian cultural clues in the design of this region.]

Identifying content as favorite of the players from the Middle East: In a limited number of posts, users from Egypt and Lebanon discuss their favorite champions. Among the Lebanese players, Akali seems favorable. For Egypt, it is Alistair.

Racism and/or Islamophobia: Finally, there are numerous posts that display an amalgamation of racism and Islamophobia.

Although there are multiple nationalities and ethnicities in the MENA region, a generic kind of racism towards “Arabs” is apparent. In reality, Arab identity is not monolithic, and there is a lot of nuance between the Gulf countries, the rest of the Middle East, North Africa, and the diaspora. Similarly, although there are a lot of religions in the region, local users are almost always

assumed to be Muslims and are met with hostility. Below are some examples of these comments:

- “Aren’t you all running around on the streets with AKs and selling drugs and bombs to each other? How is that you are on the internet? :O”
- “Are women allowed to join this [...] or women can’t play [LoL] in your countries? [Do] you throw rocks [at] them if they are caught playing [...]?”
- “Shouldn’t you be blowing stuff up instead of playing LoL?”
- “You ruined our country with your retarded desert culture now you want [to] ruin our servers too? Stay away please.”
- [In response to Arabic language support] “Because [you] could talk about plans [on] how to bomb Europe, and noone would understand it.”
- “You plan to go all JIHAD on the enemy team?”

According to the coding, although EUNE produced rich discussions in terms of word count, EUW and NA produced more coding in terms of the context. Hate speech was more common in EUW and NA than in EUNE with EUW being marginally higher (Table 6). Identifying content as inspired by the Middle Eastern cultures was more prevalent in NA. This finding could be explained as players of the diaspora adopting these content pieces more eagerly. Numbers around the discussions of an Arabic server suggest that the Arabic players in the Middle East usually log-in to EUNE and EUW.

Table 6: Racism and/or Islamophobia targeting the Middle East in 89 threads from the League of Legends official forums. There was more hate speech in EUW and NA than in the EUNE forum

Forum region	Racism and/or Islamophobia
NA (%)*	22 (36%)
EUNE (%)*	15 (25%)
EUW (%)*	24 (39%)
Total (% to the total)	61 (21.6%)

Comments such as these constitute almost one-fifth of the discussions regarding the gamers in the region and their needs, regularly inhibiting fruitful discussions among the community and developers. As previous studies suggest, “Internet trolls live to upset as many people as possible, using all the technical and psychological tools at their disposal” [25] (p. 2). Consequently, it can become hard to differentiate between a comment that represents a genuinely wrong perception of a culture with one that is intentionally distorted to cause distress and reaction.

4.2 Qualitative Analysis of In-Game Chat

In a LoL match, players can use both push-to-talk or text chat. Our analysis did not include any voice chat. The default chat options allow players to communicate with their team members, but they can also change their settings to communicate with the opposing team members, too.

Out of the chat logs of 200 matches, we identify 1058 toxic segments with the following tendencies for the segment count: $\bar{x} = 5.305$, $median = 4$, $R = 30$. (A segment consists of a chat line with a toxic word and the following exchange.) Out of 10 players who join a match (5 players on each side) the number of players who were involved in toxicity was usually just 1 or 2. The central tendencies for the number of players who participate in toxic chat are: $\bar{x} = 1.685$, $median = 1$, $R = 2.5$. This is a surprising and important result as it illustrates that the majority of the community will usually not engage in toxicity. There is a moderate positive linear correlation between the number of toxic messages and the number of players involved in a match ($r = .617$, $p = 2.2e-16$) which is unsurprising.

We find no correlation between the languages used within a match and the toxicity count of the match (155 were in English only, 77.5%; 31 were Arabic and English mixed, 15.5%; and 14 were a mix of English and a non-Arabic language, 7%). As a result, we conclude that toxicity regarding language use is not a critical issue, although it may occur from time to time. Additionally, we coded the 1,058 toxic segments in terms of their content. The results are given in Table 7.

Table 7: Codes of toxic discussions in 200 online League of Legends matches involving at least one player from the MENA and at least one toxic keyword

Category	Sub-category	EUNE		EUW	
		Count	%	Count	%
Non-toxic Use	Game Element	1	0.18	1	0.20
	Own Team	22	3.91	7	1.41
Game Elements	Lag	15	2.67	12	2.42
	Other	17	3.02	11	2.22
Gaming Skills	Other Team	23	4.09	43	8.67
	Own Team	171	30.43	175	35.28
	Self	32	5.69	42	8.47
Personal	Other Team	5	0.89	9	1.81
	Own Team	276	49.11	186	37.5
Racial, Ethnic, or Cultural		0	0	10	2.02
Total		562		496	

The distributions in Table 7 show that there is not a drastic difference between the servers in terms of general toxic chat. In terms of toxic discussions focused on racial, ethnic, or cultural context, EUW leads significantly. There was no such discussion in our sample set within EUNE. This finding is in-line with our previous observations that the players from the Middle East were more likely to express their identities in EUNE, and that racist or Islamophobic comments were less likely to appear in the EUNE forums. This difference might be the result of the EUNE community being more used to Arabic-speaking players or a concentration of MENA players in the server that prevent toxic chat from being prevalent.

Non-toxic use refers to the usage of toxic words as “friendly quips.” Led by the variations of “bitch” and “fuck,” this code showed us that 2-4% of the automatically detected toxicity was

not hate speech at all. This result proves the importance of qualitative and context-aware analysis [35].

Between 4-6% of the toxic chat was directed toward **game elements** like champion design, NPCs, hardware, and lag issues. Since lag and ping issues were the most voiced, we showed their percentage in a different line. This use category is led by variations of “fuck” and “wtf.”

Gaming skills refer to chat segments wherein the players judge each other’s gaming skills. This use category is led by variations of “noob,” “suck,” “useless,” “dumb,” and “wtf.” Although this kind of chat does not refer to personal attributes or information, it has the potential to escalate into more personal insults quickly. Combined with the previous result that a mean of only 1.685 players join in on the toxic chat, it is possible to conclude that many of these insults go unanswered. It is also important to underline that very few of these chats take place between the teams but instead they stay mostly within team members. Players curse their own personnel skills more than they curse the skills of the other team.

When discussions around gaming skills get heated, they escalate into **personal** discussions. This category marks the toxic language that transcends the boundaries of the game and game content. This use category is led by variations of “stfu,” “fuck,” “retard,” “idiot,” “ass,” and “mother.” A special section within this category that relates to our research is the racial, ethnic, and cultural slurs.

Finally, we identified some specific toxic talk based on **race, ethnicity, or culture**. Examples of this include:

- Skills or the incompetency of the Arab players (e.g., “Arabs... noobs,” “he is a fucking noob [A]rabian”): A combination of assault on both gaming skills and personal attributes.
- Referring to an Arab player as Ziggs (bomber champion) although the player is not using that character (e.g., “Next time you are dead noob Ziggs [...] lol I troll vs Ziggs”).
- Referring to an Arab player with stereotypical Arabic names although that is probably not the name of the player (e.g., “sorry Ahmed, ffff, go kill yourself,” or “mohamed come nooob”). Although some of this use can border on the verge of being friendly quips, they usually have a derogatory context.

We also investigated the correlations between different codes (see Table 8). This indicates how the escalation of a toxic chat can be predicted. According to these results, talking trash about the game elements is an indication of the emergence of toxic chat on the team and personal levels. The results imply that criticizing the gaming skills of others also has a significant chance of escalating into communication of personal nature.

Table 8: Pearson correlation coefficients between toxicity codes

	Non-toxic Use	Game Elements	Gaming Skills	Personal
Non-toxic Use	1	$r = .239$ $p = .0006$	$r = .043$ $p = .5472$	$r = .101$ $p = .1558$
Game Elements		1	$r = .359$ $p = 1.837e-07$	$r = .316$ $p = 5.146e-06$
Gaming Skills			1	$r = .215$ $p = .0023$
Personal				1

5 Discussions and Implications of Findings

This study provides novel insights on in-game toxicity through the lens of culturally specific hate speech. We also illustrate how this kind of toxicity might be informed by the design of game elements and content.

First, based on reading and coding both the chat logs and forum messages, dictionary-based techniques are insufficient to detect, understand, and moderate such toxicity. Rather, interpretation of hate is based on how the words are used and what the language norms within a team and/or forum context are. Even then, the distinction between trolling, cultural misconceptions, and purposefully abusive use of language is difficult to ascertain, as individuals may experience the same “hateful” comment differently [28, 29]. Although it might be futile to compare the severity of toxicity of different communities and ethnicities endure online, developers and community managers cannot rely on blanket solutions to detect or manage toxicity that different communities face. Quantitative and automated techniques must be augmented with qualitative analysis and community insights to pinpoint and address toxicity in the gaming community.

Second, it might be easy to dismiss the cultural implications of character design in games like LoL since they take place in fictional worlds. However, our research shows that the real-world connotations of character, lore, costume, weapon, and location designs are frequently recognized and discussed by the player community. At their best, these designs are appreciated and create positive inspirations both for the players who are from those specific cultures and the rest of the player community. At times though, they might become derogatory tools for toxic behaviors targeted toward specific communities. When developers draw design clues from the real-world cultures (e.g., ancient Egyptian myths), they should be aware of the implications for player communities who might be seen as close to that culture. Although some of these connotations are emergent and hard to foresee (e.g., designing a “bomber” character like Ziggs and foreseeing that it would become a flagbearer for abusing players from the Middle East), some might be detected early by working closely with diverse player communities for playtesting and design feedback. The argument that any virtual world is fictional does not circumvent the

responsibility to work closely with communities to create non-stereotypical, positively inspiring, and complex characters—especially when inspirations from real-world cultures are so apparent and recognizable.

Finally, the prevalence of hate speech and racism can vary by geographic location of the server/forum, which is a detail that gaming companies should recognize in the context of moderation. One likely explanation for the variation that we observed is that a large share of Middle Eastern users in a server/forum reduces hate speech, possibly due to self-moderation (see e.g., [24]). Thus, creating both in-game and online spaces that have robust representation of diverse player groups could mitigate race- or ethnicity-related toxicity, although the competitive nature of the game environment may work against such a strategy.

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