



How do people typically respond to social exclusion on social media? Clustering and personas from UK and Arab samples

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Abstract

Social media can foster community but also enable harmful interactions that violate Gender Equality and Social Inclusion (GESI) values. This study explores how individuals respond to such violations by examining four strategies: resistance (challenging the offender), internalization (self-blame), education/advocacy (raising awareness), and detachment (withdrawing). We investigated how these strategies relate to users' sense of inclusion/exclusion, self-esteem, and self-efficacy. Using clustering techniques, we analyzed survey data from 322 UK and 312 Arab Gulf Cooperation Council (GCC) participants, all active social media users aligned with GESI principles. Two main clusters emerged in both regions. In the UK sample, detached observers showed low self-esteem, low self-efficacy, and high exclusion, while engaged advocates showed the opposite. In the Arab sample, silent bystanders exhibited emotional withdrawal, low self-esteem, and low self-efficacy, whereas empowered educators actively promoted inclusivity. The study highlights how these clusters and personas can support efforts to promote GESI on social media.

Keywords Gender equality · Social inclusion · Social exclusion · Social media · Digital wellbeing

Introduction

Gender Equality and Social Inclusion (GESI) refers to efforts aimed at ensuring equitable access to resources, opportunities, and participation for all individuals, including women and socially excluded groups. GESI promotes inclusive policies and societal mindsets that strengthen the voice and influence of marginalized populations. Inclusion theory suggests that modern societies rely on structured social systems that integrate individuals into networks of communication and participation, helping maintain social cohesion and stability (Nassehi, 2005; Schirmer & Michailakis, 2015). The

need to belong theory suggests that humans are fundamentally motivated to establish and maintain meaningful interpersonal relationships (Baumeister, 2012). This motivation is typically satisfied through regular positive interactions within stable and enduring social bonds. Because belongingness represents a core psychological need, disruptions to social relationships can lead to negative emotional and psychological consequences. Consequently, experiences of social exclusion may significantly influence individuals' reactions and behaviors in social environments, including online platforms.

Social structures related to inclusion can manifest through communication channels connecting the media to the audience (Loosen & Schmidt, 2012). In this context, the media functions as an information conduit, while the audience acts as the recipient of this information. This perspective underscores the significance of social media platforms as influential sources of information that can shape individuals' attitudes and behaviors (Zhou et al., 2023). Social media offers a special medium to facilitate teamwork, socializing, and information sharing, which can help narrow the gender gap and improve social inclusion (Parwani et al., 2019). Through these platforms, users interact with acquaintances, friends, and family, thereby strengthening

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personal connections, maintaining social networks, and participating in online communities to share and reflect on their views. However, the other side of social media involves social rejection or exclusion, which represents a prevalent challenge, particularly in the online environment (Lutz & Schneider, 2021). As digital technologies become increasingly integrated into everyday life, exposure to online harassment and abusive interactions has also increased (Statista, 2025). Evidence from national surveys further highlights the gendered nature of online abuse. For example, studies conducted in the United Kingdom indicate that a substantial proportion of women who experience online abuse report forms of cyberstalking or other intrusive online behaviors, while men are more likely to report online hate motivated by sexual orientation (Statista, 2022). These patterns illustrate how online environments can reproduce broader social inequalities, making it important to understand how users respond to discriminatory or exclusionary content on social media.

Social media differs from traditional mass media by allowing users to control their self-presentation and interactions, shaping their sense of inclusion or exclusion beyond the physical world (Vendemia & Fox, 2024). Social exclusion is characterized by feelings of psychological or physical separation from others, affecting individuals' needs for control, belonging, and fulfillment in life (Timeo et al., 2020). In social media contexts, feelings of social inclusion and exclusion significantly influence how individuals express their opinions. According to the Spiral of Silence Theory (SST), individuals are influenced by their perceptions of the beliefs and opinions of the majority, which affects their decisions to express their own views or remain silent in social contexts (Noelle-Neumann, 1974). A central premise of this theory is that the fear of isolation drives such behavior. Individuals' feelings of inclusion or exclusion can therefore shape their pro-social actions. In particular, a sense of belonging, strengthened by perceived social support, plays a crucial role in promoting pro-social behavior within online communities (Lutz et al., 2024). Conversely, the fear of social exclusion may discourage individuals from speaking out, leading them to conform to prevailing opinions under peer pressure (Shin et al., 2022). Interestingly, feelings of exclusion on social media can also motivate pro-social behaviors by increasing engagement and interaction. Research by Lutz and Schneider (2021) found that social exclusion, particularly when experienced as ostracism, influences individuals' pro-social actions. Similarly, Williams (2009) suggests that individuals who feel excluded may engage in behaviors aimed at improving their standing within social circles. Inara Rodis (2024) found that women from minority groups sometimes responded to cyber aggression online in ways

they might not have in person, as they felt more comfortable expressing themselves in digital spaces.

Existing literature has examined opinion expression on social media, identifying both the barriers and facilitators that influence this behavior (Lee & Chun, 2016). Personal factors such as perspective-taking and the need for cognition, along with perceived impacts on relationships, can affect individuals' willingness to challenge violations. Research indicates that controversial topics may motivate corrective actions, encouraging individuals to express their opinions in an effort to change others' perspectives on public issues (Duncan et al., 2020). Conversely, when facing controversial situations, individuals may choose to remain silent to avoid the risk of social exclusion (Oz et al., 2024). This dynamic becomes particularly significant in the context of social exclusion incidents. Such incidents can have long-term consequences for individuals' general well-being, with younger people who spend excessive time on social media being more vulnerable to these experiences (Dong & Saini, 2023). As incidents of social exclusion affect individuals' emotions, they can trigger coping responses aimed at managing these experiences of exclusion (Dong & Saini, 2023). These responses may manifest as aggression, defensive behaviors, or psychological reactance (DeWall & Bushman, 2011).

In online environments, experiences such as cyberbullying, trolling, and discriminatory comments may trigger different coping responses among users. Understanding these responses is particularly relevant when examining reactions to GESI-violating content on social media. Coping strategies refer to the behavioral and psychological actions that individuals use to manage, reduce, or respond to stressful experiences (Folkman & Lazarus, 1980). In the context of discrimination and bullying, researchers have employed various classifications of coping strategies (Velasquez & Montgomery, 2020), primarily distinguishing between avoidance and approach coping strategies (Roth & Cohen, 1986). Avoidance coping strategies refer to the methods victims use to evade bullying situations, including tactics such as externalization, internalization, and cognitive distancing (Quynh Ho et al., 2022). These strategies may increase an individual's vulnerability to depression. In contrast, approach coping strategies encompass victims' efforts to confront and address cyberbullying, including seeking social support and using problem-solving techniques (Quynh Ho et al., 2022). Such strategies focus on addressing and resolving the problem, which may help individuals feel better and reduce negative self-assessment (Dolenc, 2015). These strategies are therefore considered effective means of combating cyberbullying and reducing negative emotions. The literature has also identified additional coping strategies, such as seeking

support, ignoring the situation, using technology-based coping methods, and confronting the aggressor. Prior research has also distinguished between passive victims, who tend to withdraw and avoid confrontation, and more aggressive or provocative victims who actively confront perpetrators (Mahady Wilton et al., 2000).

Previous literature has linked personal factors with pro-social behavior in various contexts. Among these psychological variables, self-efficacy plays a crucial role in confronting challenging situations, as it reflects individuals' beliefs in their ability to achieve intended goals while overcoming potential obstacles (Salvo-Garrido et al., 2024). Moreover, beliefs in one's self-efficacy influence the ability to self-regulate across cognitive, motivational, affective, and behavioral dimensions (Bandura, 1981), ultimately promoting the expression of prosocial behaviors. Additionally, individuals with high self-esteem are more likely to assist others, as they perceive themselves as more valuable to those around them and more capable of providing support to those in need (Baumeister et al., 2003). Conversely, individuals with low self-esteem may hesitate due to self-doubt and internal conflict (Yu et al., 2018).

Cultural variations can also influence social behaviors on social media platforms. Norms, values, and perceptions embedded within different cultures play a critical role in shaping how individuals engage and interact online. Cultural values can influence individuals' psychological processes, including self-efficacy, judgment, and emotional responses. In collectivist societies, where harmony and conformity are prioritized, individuals often avoid confrontational situations and emphasize the importance of maintaining social bonds (Hofstede, 1984). Collectivism highlights the importance of belonging to a close-knit community rather than pursuing independent actions and personal interests (Al-Omouh et al., 2022). In contrast, individualistic societies tend to place greater emphasis on personal autonomy than on collective social interactions (Al-Omouh et al., 2022). Researchers frequently rely on WEIRD (Western, Educated, Industrialized, Rich, and Democratic) samples, which may limit the generalizability of findings and introduce cultural bias. In this study, we include samples from both the UK and the Arab GCC region to address the frequent critique of relying on WEIRD populations and to account for cultural differences, as Arab societies exhibit distinct cultural characteristics. This diverse sampling approach allows us to offer a more comprehensive and inclusive understanding of global perspectives, highlighting cultural variations that are often overlooked in research.

In this study, we investigate users' coping responses to anti-social behaviors in social media contexts, particularly in relation to content that violates GESI principles. By

employing clustering techniques, we aim to identify distinct profiles that represent patterns of relationships among coping response behaviors, self-esteem, self-efficacy, and individuals' sense of inclusion and exclusion on social media platforms. As these clusters and profiles may vary across cultures, we examine two distinct cultural contexts: the British and the Arab GCC. Profiling users based on these behavioral, personal, and social factors can provide insights into different user groups and enable a more nuanced understanding of how social media platforms and behavior-support programs can be designed accordingly.

Despite the growing body of research examining social media behavior, several gaps remain. First, prior studies often investigate coping strategies, psychological resources, and social inclusion separately, rather than examining how these factors combine to shape individuals' responses to antisocial behavior online. Second, limited research has explored how different coping strategies and psychological characteristics form distinct user profiles, particularly in the context of GESI violations on social media platforms. Third, most existing studies rely on WEIRD populations, leaving cross-cultural variations in coping responses relatively underexplored. Addressing these gaps requires a person-centered approach capable of identifying patterns of relationships among psychological and behavioral variables across different cultural contexts. Accordingly, this study addresses the following research questions:

RQ1 How do individual-level factors, specifically coping response behaviors, self-esteem, self-efficacy, and perceived inclusion/exclusion, contribute to the formation of distinct user profiles in response to GESI-violating content on social media?

RQ2 To what extent do these user profiles (clusters) differ across cultural contexts, specifically between users from the UK and the Arab GCC region?

Method

Participant recruitment and selection

In this study, social media use refers to engagement with online social media environments where users communicate and interact with others within their networks or online communities. The questionnaire focused on interactive behaviors rather than passive browsing, including communicating with acquaintances, participating in discussions, and responding to posts on social media platforms. Examples of such environments include social networking

sites, online forums, and messaging applications that support group-based interaction (e.g., WhatsApp). Participants were therefore required to be at least occasional users of social media to ensure familiarity with such interactions. In this context, pro-social behavior refers to actions aimed at promoting gender equality and social inclusion online, including educating others about GESI violations, challenging discriminatory posts, or advocating against exclusionary behavior. Content violating GESI principles refers to posts or comments on social media that promote gender inequality or social exclusion, which participants may encounter or witness in online discussions, whether directed at themselves or at others within online communities.

The study recruited participants from GCC countries and the UK. Eligibility required agreement with GESI principles, as the aim was to examine responses to GESI violations among advocates. Participants were also required to be at least occasional users of social media in either public or private groups. This criterion helped control for general inactivity unrelated to reactions to GESI violations. Individuals under the age of 18 were excluded. We also removed responses completed in less than half the median completion time (after excluding those exceeding twice the expected time), as well as entries containing repetitive, monotonous, or contradictory answers. Non-binary participants ($n=3$ in the UK) were excluded due to insufficient representation.

The final sample comprised 322 UK participants (35% male, 64% female) and 312 GCC participants (45.5% male, 54.5% female). Recruitment was conducted between February and March 2024 via TGM Research, a company specializing in survey data collection (<https://tgmresearch.com/>). Participants received compensation upon completing the eligibility screening and passing the quality checks. The anonymized dataset is publicly available through the Open Science Framework (see Supplementary Materials). Ethical approval was obtained from the Institutional Review Board. Prior to completing the survey, participants reviewed an overview of the study objectives and key terms (e.g., GESI).

Measures

Participants read and agreed with three statements on gender equality and three on social inclusion, based on the GESI Working Group (2017), covering representation, decision-making, human development, and cultural and linguistic diversity. The survey included attention checks to ensure data quality. It was initially developed in English and translated into Arabic using the back-translation method (Brislin, 1970) to ensure translation accuracy and consistency across both languages.

Demographic measures

Participants were requested to provide information regarding their age and gender. Age was collected from the participants in years, while gender was collected using an open-text format.

Coping with social exclusion scale

We adopted the scale from Wei et al. (2010), which examines coping mechanisms for discrimination across five key dimensions: education, resistance, detachment, internalization, and drug and alcohol use. However, in the context of this study, we only included the first four dimensions. The adopted scale consists of 20 items, with five items per dimension, evaluated using a 6-point Likert scale: 1 (“never like me”) to 6 (always like me). The score range for each dimension is from 5 to 30. Education represents attempts to address discrimination through personal and societal educational or advocacy efforts. A sample of the questions is: “I try to educate others about the negative impacts of violating gender equality/social inclusion on social media”. Internalization refers to the inclination to blame oneself for the cause or responsibility of a discriminatory event. For example: “I wonder if I did something to offend others”. Resistance involves actively opposing individuals who engage in discriminatory behavior. For instance: “I get into an argument with the person”. Detachment involves distancing oneself from social support and feeling unsure about how to handle discrimination. For instance: “It’s hard for me to seek emotional support from other people”.

Reliability scores for the Arab sample across the four dimensions are as follows: education $\alpha=0.931$; resistance $\alpha=0.789$; detachment $\alpha=0.732$; internalization $\alpha=0.708$. For the UK sample: education $\alpha=0.935$; resistance $\alpha=0.779$; detachment $\alpha=0.784$; internalization $\alpha=0.812$. This indicated good reliability for the measure in both samples.

Social inclusion and social exclusion

Social inclusion and social exclusion were assessed using the General Belongingness Scale (GBS) developed by Malone et al. (2012). This scale includes two six-item subscales: social inclusion (acceptance) and social exclusion (rejection). Inclusion items include statements like “I feel accepted by others on social media” and “I feel connected with others on social media”, while exclusion items include “Because I do not belong, I feel distant during online conversations”. Participants rated their agreement using a 7-point Likert scale (1 = “Strongly Disagree”, 7 = “Strongly Agree”), yielding subscale scores from 6 to 42. Reliability for the GCC sample was $\alpha=0.889$ (inclusion) and $\alpha=0.908$ (exclusion).

(exclusion); for the UK sample, both subscales had $\alpha=0.919$, indicating excellent internal consistency.

Self-esteem scale

We assessed participants' self-esteem using a single item proposed by Robins et al. (2001), a 5-point Likert scale ranging from 1 ("not very true of me") to 5 ("very true of me").

General self-efficacy (GSE-SI) scale

Perceived self-efficacy refers to individuals' beliefs in their ability to exert control over challenging situations and manage their own functioning effectively, which was assessed using the single-item GSE-SI scale (Di et al., 2021). The 5-point Likert scale that ranges from 1 ("not very true of me") to 5 ("very true of me") measures participants' agreement with the following statement "How confident are you that you can deal effectively with most of the challenges of everyday life?"

Data pre-processing

Prior to cluster analysis, we conducted a two-step data preprocessing procedure. First, we used the base R function `scale()` to standardize the UK and Arab datasets. This function normalizes numerical columns by centering them around zero (mean=0) and scaling by the standard deviation (SD=1), ensuring comparability across variables on different scales. Next, we assessed the clustering tendency by visually analyzing two matrices. The first displayed correlation-based distances among rows in the original dataset, calculated using the Spearman method with the `get_dist()` function in R. The second was a random matrix of equal dimensions for comparison. Our visual inspection supported the suitability of the data for clustering, as shown in Figure A1 (Appendix). In the figure, the original dataset appears on the left and the randomized dataset on the right. Color coding reflects similarity: red denotes high similarity (distance=0), and blue indicates low similarity (distance=1), with intensity levels corresponding to the degree of dissimilarity. Items within the same cluster appear sequentially, revealing distinguishable patterns in the original dataset that were absent in the randomized one.

Clustering approach

We employed partition clustering (K-means) to group participants by similarities across four coping dimensions, self-esteem, self-efficacy, and inclusion/exclusion perceptions. This unsupervised method segments data into predefined

clusters (k), with items within the same group demonstrating a high degree of similarity, while those in different groups exhibit significant dissimilarity. The clustering process was carried out using the Hartigan-Wong method (Hartigan et al., 1979), which determines the overall variation within clusters by summing the squared Euclidean distances between data points and their corresponding centroids (the mean of the points in the cluster). In this approach, each data point is assigned to a cluster in a way that minimizes the total sum of squared distances to its designated centroid, employing the `kmeans()` function from the stats package in R. Q3: (Hartigan & Wong, 1979)

To improve the accuracy of our clustering, we carried out three additional analyses. First, we performed k-means clustering across a range of k-values and compared the results to reduce the likelihood of arbitrary cluster assignments. Second, given that clustering results can be sensitive to the random selection of initial cluster centers (Ikotun & Ezugwu, 2022), we ran the k-means algorithm five times with different initializations, selecting the iteration that produced the lowest total within-cluster sum of squares. We tested 15, 25, 35, 45, and 55 different random starting points over 1000 iterations to achieve more reliable results. Lastly, considering the K-means method's susceptibility to outliers, we carefully examined the variables for any potential outliers before conducting the clustering analysis.

Exploratory cluster analysis was performed to identify participant subgroups based on similarity. Several validation metrics guided the evaluation. The Silhouette Score (ranging from -1 to 1) assesses how well an object fits within its cluster: 1 indicates clear separation, 0 implies overlap, and -1 signals misclassification. The Calinski-Harabasz index measures the ratio of between- to within-cluster dispersion, with higher values indicating better-defined clusters. Welch's test was also used to compare variable means across clusters. Unlike traditional ANOVA, Welch's test accommodates unequal variances, making it robust under heterogeneity.

Archetype profiling

We examined the patterns of individuals' coping mechanisms in response to social exclusion on social media within each sample using archetypes or profiles.

Results

Data sample description

A Welch's t-test was used to test the null hypothesis that these two samples have equal means. Table 1 compares

Table 1 Demographic and psychological variables for Arab and UK participants

Variables	Arab GCC (<i>N</i> =312) M (SD)	UK (<i>N</i> =322) M (SD)	Welch's test
Resistance	15.50 (6.10)	12.36 (5.25)	$t(612.13)=6.94$, $p < .001$, $d=0.55$
Internalization	12.28 (5.24)	11.91 (5.17)	$t(630.75)=0.91$, $p=.364$, $d=0.07$
Education	17.79 (7.22)	12.62 (6.41)	$t(618.07)=9.51$, $p < .001$, $d=0.76$
Detachment	14.03 (5.88)	13.60 (5.80)	$t(630.68)=0.93$, $p=.355$, $d=0.07$
Self-esteem	4.31 (0.94)	2.70 (1.14)	$t(615.47)=19.41$, $p < .001$, $d=1.54$
Self-efficacy	4.16 (0.91)	3.36 (1.05)	$t(624.59)=10.24$, $p < .001$, $d=0.81$
Inclusion	35.42 (5.19)	32.56 (6.17)	$t(619.97)=6.33$, $p < .001$, $d=0.50$
Exclusion	14.54 (7.12)	17.08 (7.43)	$t(631.93)=-4.40$, $p < .001$, $d=-0.35$

various variables between participants from the Arab GCC and the UK. The results indicate significant differences between the two samples in all variables measured, except internalization and detachment. Key findings demonstrate that Arab GCC participants exhibited higher levels of resistance, education, sense of inclusion, self-esteem, and self-efficacy compared to their UK counterparts. Conversely, the UK sample showed higher scores in exclusion. Overall, these findings highlight notable differences between the two populations.

Correlation analysis

The correlation analysis is presented in the appendices (Figure A2). For the Arab sample, internalization is positively and significantly correlated with inclusion. Education has strong positive correlations with self-esteem, self-efficacy, and inclusion. Conversely, it shows a negative correlation with exclusion. Detachment is negatively correlated with self-efficacy and inclusion and a positively correlated with exclusion. For the UK sample, resistance has significant positive correlations with self-esteem, self-efficacy, and inclusion. Internalization is negatively correlated with self-esteem, self-efficacy, and inclusion, and positively and significantly correlated with exclusion. Education has positive correlations with self-esteem, self-efficacy, and inclusion. Detachment is notably negatively correlated with self-esteem, self-efficacy, and inclusion, and positively and significantly correlated with exclusion.

Clusters evaluations

To determine the optimal number of clusters, we used the NbClust() function from the NbClust R package (Charrad et al., 2014). This function computes 30 different indices to assess the appropriate number of clusters and suggests the best clustering solution based on varying combinations of cluster numbers, distance measures, and clustering methods (Charrad et al., 2014). A K-means clustering algorithm (Charrad et al., 2014) was employed to detect the presence of *k* groups using the UK sample of 322 observations and the Arab sample of 312 observations. This technique ensures that individuals within the same cluster exhibit high intra-class similarity, while those in different clusters demonstrate low inter-class similarity. The clustering was executed using the standard R function kmeans() from the stats package. Accordingly, we calculated clustering solutions for 2 clusters. For details, see the appendices, Figures A3 and A4.

The results of Welch's t-tests reveal significant differences between the clusters for most variables among both UK and Arab participants. In the UK sample (Table 2), significant differences were found across all variables between the two clusters ($p < .001$ for all variables). Notably, large effect sizes were observed for detachment, self-esteem, self-efficacy, and exclusion, highlighting substantial differences in these characteristics between the clusters.

For the Arab sample (Table 3), significant differences were also found across most variables. While internalization and resistance were not significant ($p > .05$), all other variables showed statistically significant differences, further validating the clustering approach.

Table 2 Comparison of cluster means of UK participants using welch's t-test

Variables	First cluster (<i>N</i> =202)	Second cluster (<i>N</i> =120)	Welch's test
Resistance	13.43 (5.24)	10.57 (4.76)	$t(269.29)=5.02$, $p < .001$, $d=0.57$
Internalization	10.91 (4.62)	13.58 (5.61)	$t(213.50)=-4.41$, $p < .001$, $d=-0.52$
Education	13.71 (6.52)	10.79 (5.80)	$t(273.60)=4.17$, $p < .001$, $d=0.47$
Detachment	11.02 (4.38)	17.95 (5.28)	$t(214.81)=-12.11$, $p < .001$, $d=-1.43$
Self-esteem	3.22 (0.95)	1.83 (0.87)	$t(268.35)=13.51$, $p < .001$, $d=1.54$
Self-efficacy	3.84 (0.74)	2.55 (0.99)	$t(199.37)=12.41$, $p < .001$, $d=1.48$
Inclusion	35.15 (4.33)	28.19 (6.35)	$t(185.55)=10.63$, $p < .001$, $d=1.28$
Exclusion	13.90 (5.33)	22.44 (7.40)	$t(192.77)=-11.06$, $p < .001$, $d=-1.33$

Table 3 Comparison of cluster means of Arab participants using welch's t-test

Variables	First cluster (N=190)	Second cluster (N=122)	Welch's test
Resistance	15.96 (6.65)	14.79 (5.07)	$t(300.79)=1.77$, $p=.078$, $d=0.20$
Internalization	12.70 (5.38)	11.63 (4.95)	$t(273.52)=1.80$, $p=.073$, $d=0.21$
Education	20.45 (6.89)	13.65 (5.61)	$t(292.92)=9.54$, $p<.001$, $d=1.08$
Detachment	12.18 (5.28)	16.91 (5.62)	$t(246.38)=-7.42$, $p<.001$, $d=-0.87$
Self-esteem	4.67 (0.57)	3.74 (1.10)	$t(163.69)=8.70$, $p<.001$, $d=1.07$
Self-efficacy	4.55 (0.55)	3.55 (1.02)	$t(166.49)=9.91$, $p<.001$, $d=1.22$
Inclusion	38.11 (3.15)	31.23 (4.98)	$t(183.43)=13.61$, $p<.001$, $d=1.65$
Exclusion	10.99 (4.65)	20.07 (6.77)	$t(194.13)=-12.98$, $p<.001$, $d=-1.56$

The silhouette analysis yielded a silhouette width of 0.18 for both the UK and Arab samples (see the visualization and further validation metrics are reported in Supplementary Material Figure A5).

One-sample t-tests were conducted on standardized variables to identify characteristics that significantly deviated from the sample mean within each cluster, allowing us to highlight defining features of each profile. In both cases, these characteristics were considered contributing features

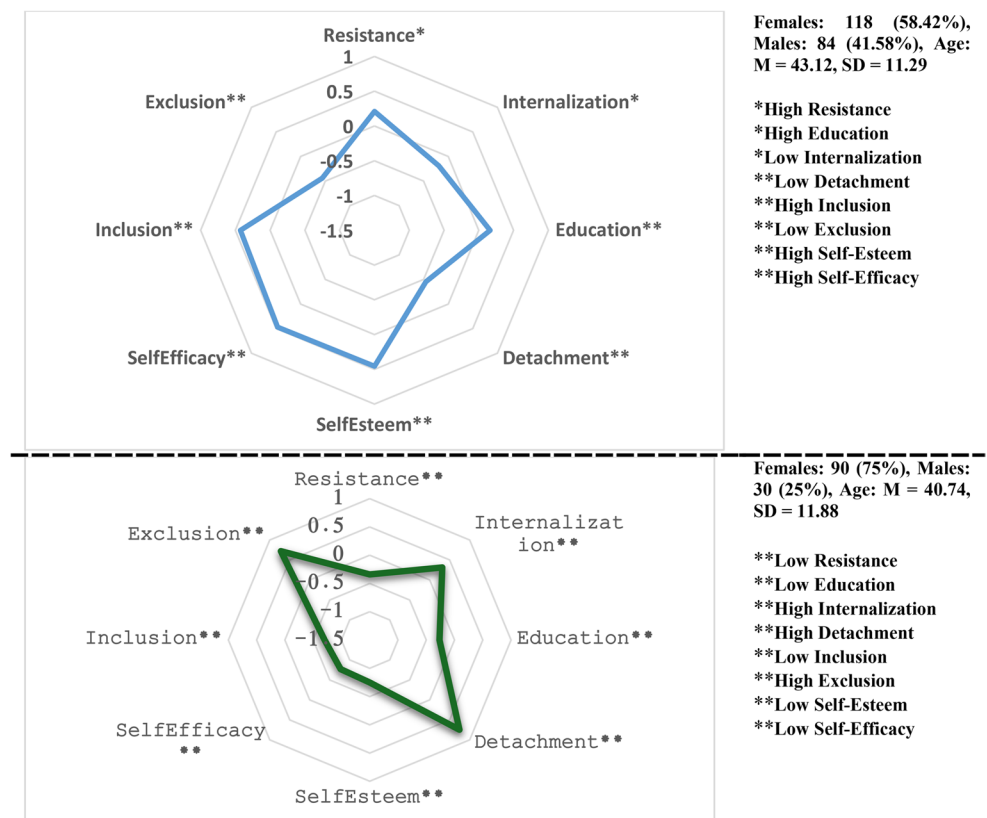
of the cluster. If the score did not significantly differ from zero, the characteristic was regarded as a non-defining feature of the cluster.

Clustering results

Our analysis aims to determine the best number of clusters, and it indicates that, according to the majority rule, the best number of clusters in both samples was 2. Figures 1 and 2 display the characteristics of these clusters for the UK and Arab samples. For the UK sample, two distinct clusters emerged based on coping responses to GESI violations on social media.

Cluster 1 displays high levels of resistance and education, and low levels of internalization and detachment. It also shows high levels of self-esteem and self-efficacy. Individuals in this cluster have a high sense of inclusion and a low sense of exclusion. They show resilience and proactive coping, driven by self-worth, confidence, and a strong sense of belonging, enabling them to confront GESI violations and engage in inclusive environments. Cluster 2 is characterized by low levels of resistance and education. On the opposite side, they show high levels of detachment and internalization. They also have low levels of self-esteem and self-efficacy. Individuals in this cluster have a higher sense of exclusion and a lower sense of inclusion. This cluster shows emotional withdrawal and low resilience, tending

Fig. 1 Cluster characteristics in the UK sample (Note: $p^* < 0.05$, $p^{**} < 0.01$, $ns \geq 0.05$, based on One-sample t-test results in the Appendices Table A1)



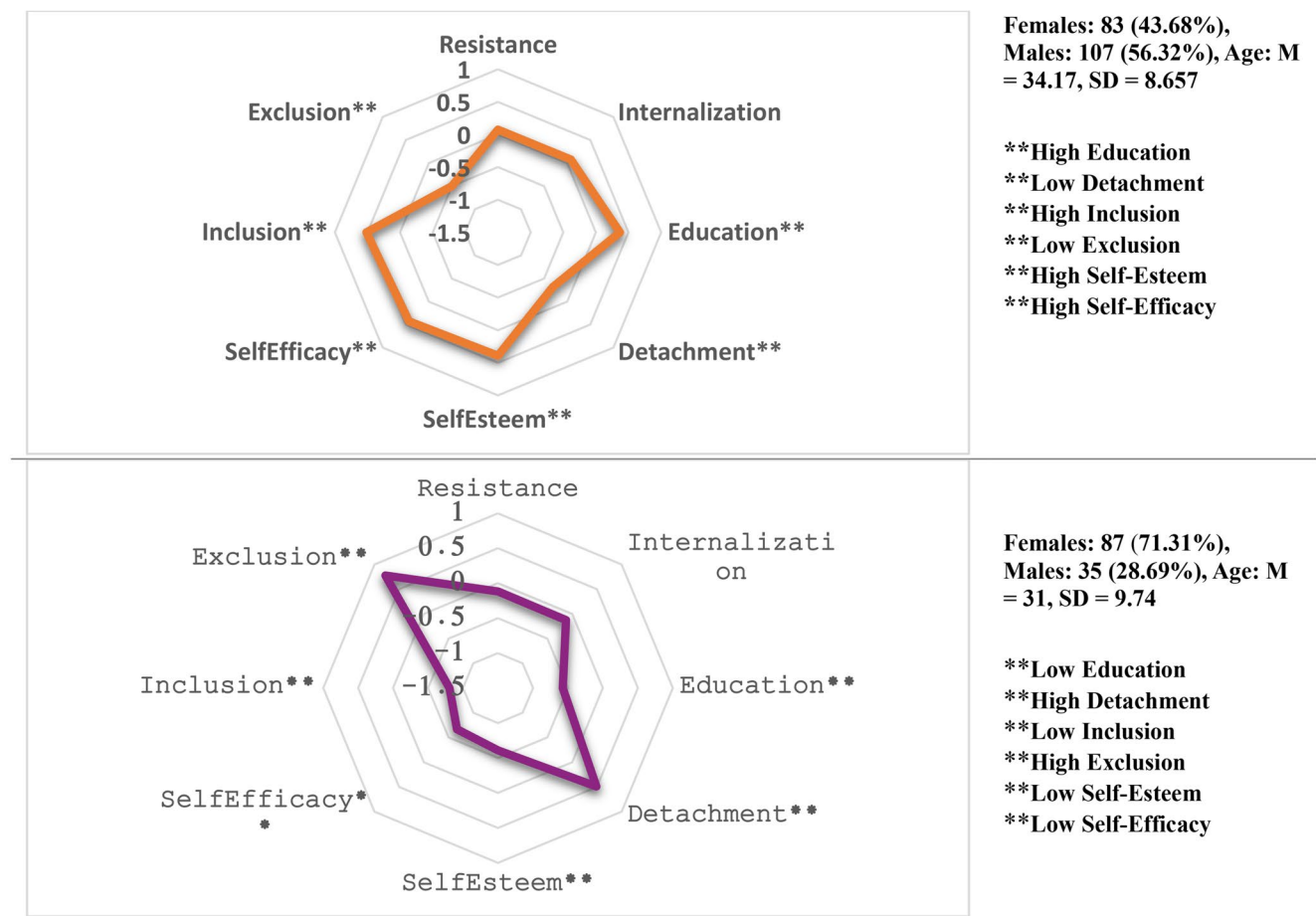


Fig. 2 Cluster characteristics in the Arab GCC sample (Note: $p^* < 0.05$, $p^{**} < 0.01$, $ns \geq 0.05$, based on One-sample t-test results in the Appendices Table A2)

to internalize distress and avoid confronting GESI violations on social media.

For the Arab GCC sample (Fig. 2), two distinct clusters emerged. In terms of coping mechanisms with GESI violations, individuals in Cluster 1 exhibit a high level of education and a low level of detachment. They also demonstrate high self-esteem and high self-efficacy. They feel included and rarely excluded, with adaptive coping marked by constructive efforts to educate others on social media. Resistance and internalization were not defining traits. In contrast, individuals in Cluster 2 show the opposite pattern, with a high level of detachment and a low level of education. This cluster is marked by low self-esteem, low self-efficacy, high exclusion, and low inclusion. They tend to emotionally disengage and withdraw from social interactions when facing GESI violations, with resistance and internalization not being defining traits.

The average silhouette width was 0.18 in both the UK and Arab samples, indicating that individual observations

were not strongly separated between clusters and that cluster membership should therefore be interpreted primarily at the group level. We retained the two-cluster solution for several reasons. First, *NbClust* indicated that $k=2$ was the plurality recommendation in both samples (UK: 8 indices; Arab: 6 indices). Although the Arab sample showed a modal recommendation of three clusters (9 indices), followed by a two-cluster solution (6 indices), this dispersion indicates limited consensus among indices. Therefore, cluster selection was guided by additional criteria, including cross-sample stability, parsimony, and interpretability (Steinley, 2006). Second, the same two-profile structure emerged independently in two cultural contexts (UK and Arab GCC), suggesting that the solution reflects a reproducible coarse-grained pattern. Third, the clusters exhibit large and theoretically coherent differences across key variables (e.g., detachment, inclusion/exclusion, self-esteem, and self-efficacy), with many effect sizes in the large range, supporting substantive interpretability despite overlap.

User personas

By analyzing cluster characteristics, we shed light on the nuanced dynamics of user interactions on social media. In the UK sample, two primary clusters emerged, illustrating how distinct personas shape the social media ecosystem (Fig. 3).

The Engaged Advocates (First Cluster): George is a 43-year-old, middle-aged individual with a high sense of inclusion in social media and high self-esteem and self-efficacy. While the relationship between social media use and self-esteem is person-specific (Cingel et al., 2022), individuals with high self-esteem as a key factor of empowerment, are more likely to use social media constructively. Additionally, the perceived self-efficacy in social media leads to high confidence in individuals' capabilities, making them more likely to engage in activism and advocacy. They use education to promote dialogue and challenge exclusionary practices. Those with greater social media self-efficacy tend to find information shared on these platforms more trustworthy and rely more on others' opinions when evaluating online content (Hocevar et al., 2014). While they strive to foster equality, their assertive resistance might escalate tensions or be misinterpreted as confrontational.

The Detached Observer (Second Cluster): Anna is a middle-aged individual who tends to internalize exclusion or detach from social media interactions altogether. With lower self-esteem and self-efficacy, she may avoid conflict and refrain from advocacy efforts. Individuals with these characteristics may find confronting GESI violations

on social media useless and feel excluded, powerless, or detached. Detachment helps manage psychological distress by emotionally distancing from stressors, but is often ineffective for resolving underlying issues. For instance, African American women facing discrimination and gendered racism frequently use detachment and internalization as coping strategies, which, while offering temporary relief, can ultimately exacerbate psychological distress (Szymanski & Lewis, 2016).

In the Arab sample, two primary groups emerged, highlighting the distinct roles personas play in shaping the social media landscape (Fig. 4).

The Empowered Educator (First Cluster): Salem is a 34-year-old male who feels accepted and connected by his peers on social media, reflecting a sense of belonging. He shows strength in his social relationships, as evidenced by his strong sense of community and connection with others. He rarely feels like a stranger in online social conversations, which enhances his overall emotional well-being. Salem has positive self-esteem, allowing him to approach challenges assertively while maintaining confidence in his abilities. Furthermore, his self-efficacy is reflected in his belief that he can effectively manage the challenges of everyday life, which is significant in navigating both personal and social dynamics. While Salem's coping behavior with discrimination does not take a highly challenging direction, he does not shy away from addressing discriminatory actions when necessary. He actively engages in educational initiatives, as advocacy efforts that promote social inclusion and gender equality on social media, demonstrating his commitment to

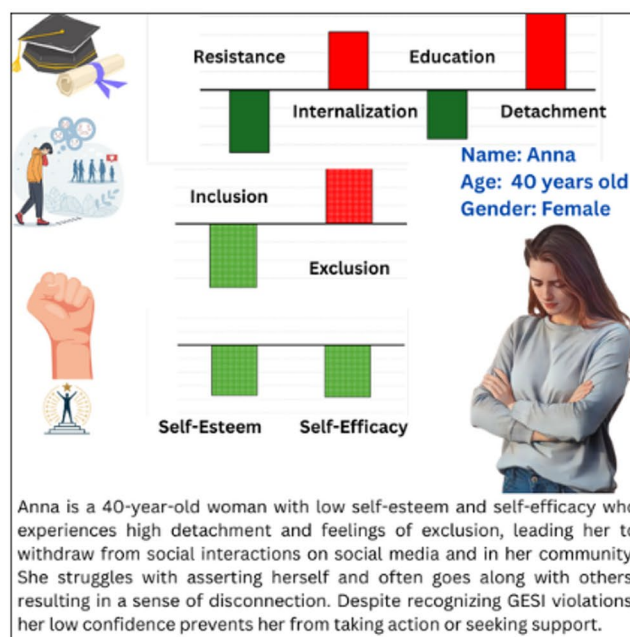
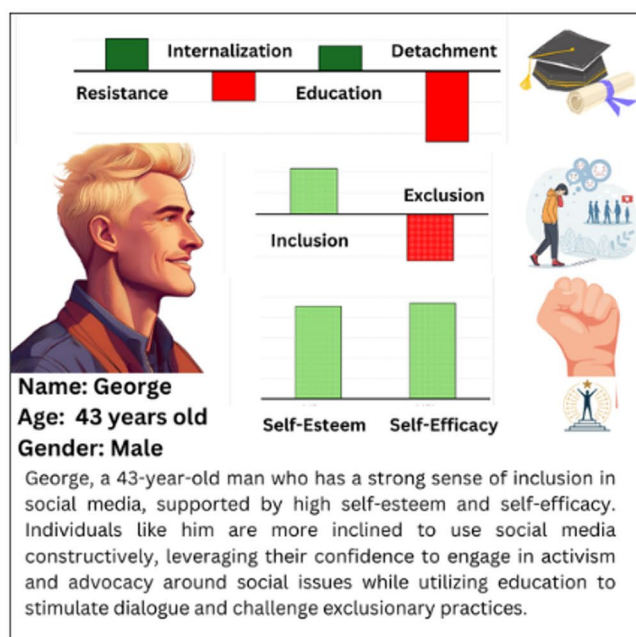


Fig. 3 Personas reflecting the clusters in the UK sample

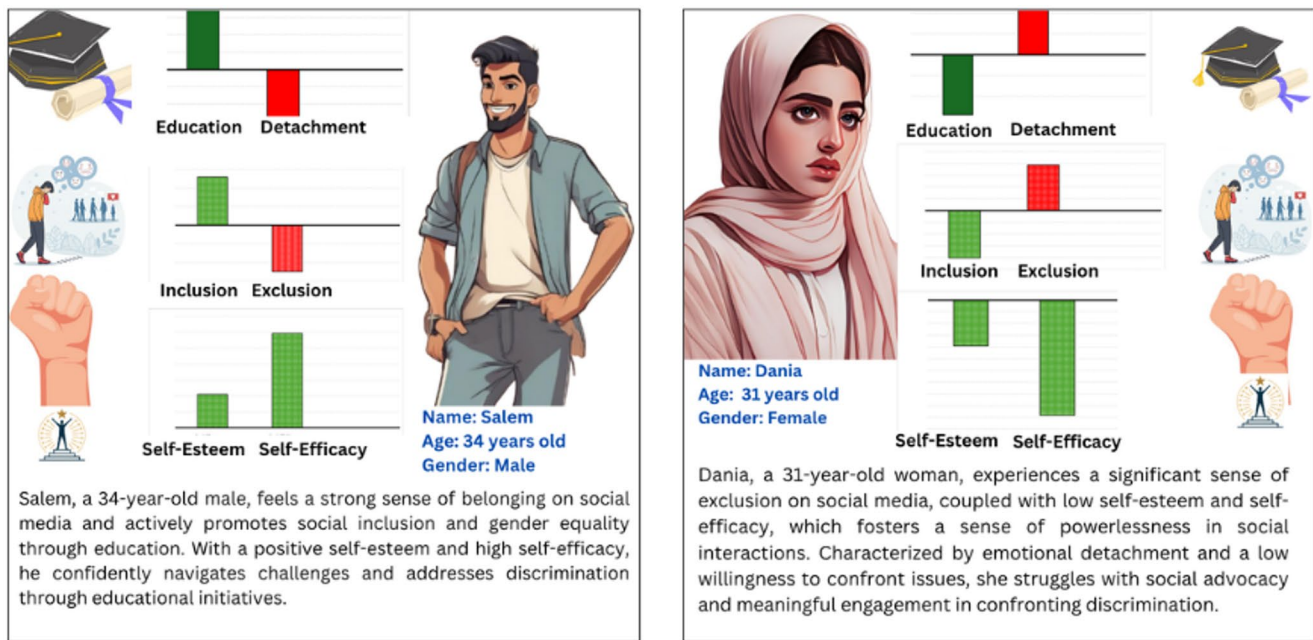


Fig. 4 Personas reflecting the clusters of the Arab sample

fostering an inclusive environment. Additionally, his low detachment signifies that he remains engaged in discussions about discrimination and inclusion rather than withdrawing from them.

The Silent Bystander (Second Cluster): Dania is a 31-year-old woman who experiences significant feelings of exclusion on social media, accompanied by a low sense of inclusion. Her low self-esteem and self-efficacy create a sense of powerlessness, making it challenging for her to navigate complex social situations. Her low willingness to confront discrimination through educational efforts is reflected in her limited engagement in advocacy initiatives such as educating others. This is often accompanied by high detachment, making it difficult for her to connect emotionally with peers or seek support. Overall, while she may desire to combat social injustices, her emotional detachment and low self-perception hinder meaningful engagement and connection with social discourse.

Discussion

The findings of this study reveal two broad coping profiles in response to GESI violations on social media across the UK and Arab GCC samples. One profile is characterized by higher self-esteem, higher self-efficacy, stronger feelings of inclusion, and greater use of active coping strategies, whereas the other reflects lower psychological resources, stronger feelings of exclusion, and greater reliance on avoidance-oriented coping. These findings can be interpreted in

light of prior theory on coping, belongingness, and social exclusion.

The findings suggest that psychological resources, particularly self-esteem and self-efficacy, play an important role in shaping coping responses to GESI violations. Particularly, the level of self-esteem is linked to coping mechanisms in response to GESI violations. The findings indicate that, in both samples, individuals with high self-esteem are associated with approach coping strategies, whereas those with low self-esteem tend to align with avoidance coping strategies. Previous research has linked high self-esteem with a positive self-view and a sense of worthiness, whereas low self-esteem is associated with feelings of self-rejection, dissatisfaction, and even self-contempt (Rosenberg, 1965). Individuals with high self-esteem tend to experience positive emotions, have confidence in their abilities, and are perceived positively by others. In contrast, those with low self-esteem often experience negative emotions, feel inadequate, and perceive themselves as less worthy than their peers (Quynh Ho et al., 2022). Seiffge-Krenke (2013) conceptual framework of coping strategies suggests that self-esteem plays a crucial role as an internal resource for developing coping mechanisms and maintaining mental health. Research has demonstrated that lower self-esteem is significantly linked to higher rates of bullying victimization and depressive symptoms among children and adolescents (Zhou et al., 2020). Additionally, Antonietti et al. (2020) found that, among adolescents, self-esteem is positively correlated with adaptive coping strategies and negatively correlated with maladaptive coping strategies. Self-esteem significantly influences individuals'

cognition, emotions, and behaviors, which subsequently affect their responses to stressors and their choice of coping strategies (Luo et al., 2023). Employing these adaptive coping strategies helps individuals manage and reduce negative emotions, which may in turn lower anxiety levels (Antonietti et al., 2020). Conversely, low self-esteem is associated with decreased self-efficacy when coping with various situations (Schraml et al., 2011).

The results of the study highlight a link between self-efficacy and coping mechanisms in response to GESI violations. High self-efficacy is positively correlated with the pursuit of challenges and a rapid recovery from failures or setbacks, whereas low self-efficacy is associated with a tendency to avoid challenges, leading individuals to perceive such situations as risks rather than opportunities (Wachs et al., 2020). Self-efficacy can be conceptualized in two main ways: broadly as general self-efficacy or in a more domain-specific manner, such as academic self-efficacy or self-efficacy in social conflicts (Bandura, 1997). In particular, self-efficacy in social conflicts refers to individuals' confidence in their capacity to effectively manage social conflict situations, making it a critical component in determining their motivation to intervene in instances of bullying (Thornberg & Jungert, 2013). A lack of confidence in one's ability to successfully intervene may lead to a diminished likelihood of taking action. Therefore, self-efficacy in social conflicts can be considered a significant predictor of individuals' willingness to intervene in bullying situations. Indeed, previous research has established a positive correlation between individuals' perceived self-efficacy and their actual or potential interventions in incidents of bullying (van der Ploeg et al., 2017).

The findings also indicate that perceived inclusion and exclusion are closely linked to coping responses to GESI violations. This finding is consistent with previous literature that has examined how various factors influence individuals' willingness to share their opinions on social media (Oz et al., 2024). People's decisions to express their views or remain silent in social contexts are shaped by their perceptions of the majority's beliefs and opinions (Noelle-Neumann, 1974). A sense of belonging, reinforced by perceived social support from others, plays a crucial role in promoting pro-social behavior within online communities (Abumalloh et al., 2024). Previous research has shown a negative relationship between the fear of social isolation and the willingness to voice one's opinions (Moy et al., 2001). Additionally, this fear is positively associated with the tendency to avoid expressing opinions (Neuwirth et al., 2007). Together, these studies support the link between a sense of inclusion/exclusion and individuals' willingness to speak out on social media, particularly when facing discrimination.

The identified clusters reveal both similarities and differences across the UK and Arab samples. In both cultural

contexts, Cluster 1 is characterized by higher self-efficacy, higher self-esteem, and stronger feelings of social inclusion, combined with higher levels of education and lower levels of detachment. In contrast, Cluster 2 shows the opposite pattern, with lower self-efficacy, lower self-esteem, stronger feelings of exclusion, lower levels of education, and higher detachment. This pattern suggests that individuals with stronger psychological resources, such as higher self-efficacy and self-esteem, are more likely to adopt problem-focused coping strategies when facing GESI violations (Mantzicopoulos, 1990). At the same time, some cultural differences were observed between the two samples. The Arab sample exhibited a higher sense of inclusion and lower levels of perceived exclusion compared to the UK sample, which was also associated with higher levels of education and resistance strategies. This pattern may reflect the influence of collectivistic cultural values, which emphasize interpersonal orientation, group belonging, and social support from one's ingroup (Triandis et al., 1985). In such contexts, perceived social support and a sense of shared responsibility may increase individuals' willingness to speak out or respond to discriminatory behavior on social media (Chun & Lee, 2017). Consequently, individuals embedded in these social structures may be more likely to rely on coping mechanisms such as education and resilience when responding to GESI violations.

In the present study, many participants lie near the boundary between empirically derived profiles, which is consistent with longstanding evidence in psychology that constructs such as coping strategies, personality traits, and related psychosocial processes are best understood as continuously distributed dimensions rather than sharply delineated categories. Similarly, in coping research, person-centred analyses often reveal latent profiles that summarise dominant tendencies but also show substantial within-profile variability, suggesting that individuals typically occupy positions along gradients of coping engagement (Nagy & Balázs, 2023). These dimensional perspectives align with broader work in personality psychology demonstrating the limitations of categorical subtype models and the predictive strength of continuous trait dimensions over rigid types (Asendorpf, 2003). Accordingly, the clusters we identify are best interpreted as pragmatic profiles that summarise dominant patterns of response across measures such as education, resistance, detachment, internalisation, inclusion/exclusion, self-esteem, and self-efficacy.

Research implications

This study emphasizes that individuals with a strong sense of social inclusion, self-esteem, and self-efficacy are more inclined to advocate against GESI violations on social media

platforms. The impact of online isolation on users' willingness to confront GESI violations cannot be overlooked, particularly as the design of online platforms can shape users' sense of inclusion or exclusion. Research has demonstrated that applying design principles in online behavior change interventions can yield successful outcomes across various domains (Gurgun et al., 2022). Therefore, there is significant potential to adapt these design principles to encourage users to engage more proactively when confronting GESI violations. For instance, the design of social media platforms can significantly influence users' sense of inclusion versus exclusion, ultimately affecting their willingness to express their opinions.

Research by Nova et al. (2021) illustrates how platform design affects minorities, influencing their self-presentation and information disclosure. Therefore, aligning different viewpoints is essential for fostering inclusive dialogue, and platforms should implement features that encourage diverse opinions to enrich online discussions. Clear content moderation practices, along with features that ensure fair visibility for diverse perspectives, are crucial for creating a comfortable environment that supports user expression. A recent study by Oz et al. (2024) further emphasizes how platform design, particularly through enhanced perceived anonymity, can increase individuals' willingness to share opinions on controversial topics by alleviating their fear of isolation. To promote inclusivity, social media algorithms should be redesigned to feature content from marginalized groups, even when such changes may conflict with mainstream business interests. Instead of focusing solely on increasing user engagement, these algorithms could prioritize the dissemination of high-quality content (Gurgun et al., 2024).

While numerous educational programs exist to guide responses to cyberbullying, we propose that personalized and interactive interventions may be more effective in encouraging real-time proactive behavior. Our research highlights the need for interventions that inspire individuals to support those facing violations. For instance, (Zou et al., 2024) advocate for the implementation of a social media chatbot designed to empower users to combat cyberbullying. Furthermore, incorporating user perspectives during the design phase of these interventions can lead to solutions that are more relevant and effective. Our study therefore suggests addressing these challenges by actively involving users in the creation of engaging, relatable, and educational interventions within social media platforms.

Individuals possess distinct needs shaped by personal factors, social environments, and cognitive capabilities. These individual differences highlight the potential benefits of personalized targeting (Höpfel et al., 2024). For example, incentives may resonate more effectively with individuals who exhibit hedonistic tendencies, as their primary motivation

lies in pursuing pleasure and gratification. In contrast, individuals with a strong social orientation may respond more positively to feedback from their social context (Höpfel et al., 2024). Clustering users acknowledges these individual differences and serves as an effective method for identifying and characterizing distinct groups. In this context, personas become an essential tool for gaining insights into users' attitudes and behaviors at a descriptive level (Chang et al., 2008).

Personas generated from clustering results serve as proxies for real users, helping to simulate diverse inputs during the design process. We developed personas that represent the coping strategies of different user groups in response to GESI violations, focusing on their sense of inclusion or exclusion, self-esteem, and self-efficacy. Compared to traditional approaches, these personas offer distinct advantages: they provide measurable insights for more accurate user representation, reduce research costs, and can be easily adapted to new users (Lenk, 2022). This data-driven approach enables researchers and developers to model user experiences without requiring direct input from every potential user. We outline key design considerations for each persona, focusing on their typical responses to GESI violations on social media. Based on these findings, we discuss how these personas may be valuable while acknowledging the need for further research to validate their effectiveness. When incorporated into co-design activities, these personas can enhance participatory design by anticipating diverse user perspectives, ultimately fostering greater awareness of GESI-related issues in the Arab GCC and UK regions.

Building on the clustering results and theoretical framework of coping, belongingness, and social exclusion, the findings also provide implications for the design of social media interventions. The use of clustering in this study does not imply precise prediction of individual behavior nor the identification of universally effective interventions. Rather, clustering enables the identification of typical user archetypes, allowing for more efficient and scalable intervention design. By focusing on representative profiles, platforms can develop intervention strategies that are better aligned with the dominant needs and motivations of different user groups, while acknowledging that not all users will conform to these archetypes. This approach supports efficient resource allocation and avoids the assumption that a single intervention model will be effective across culturally and psychologically diverse populations.

Importantly, the present findings demonstrate that the pathways through which design principles operate may not be culturally uniform. While prior work often assumes that the same mechanisms can be applied across populations, our results indicate that the relative importance of specific coping strategies differs systematically between the UK

and Arab GCC contexts. These differences are not merely descriptive but have direct implications for how interventions should be designed, framed, and deployed in culturally sensitive ways. The observed differences between the UK and Arab clusters suggest that intervention strategies should be culturally sensitive rather than universally applied. In the UK context, where self-efficacy and resistance appear particularly relevant, interventions that strengthen individuals' confidence in confronting violations may be especially effective. Approaches grounded in resistance-building frameworks, such as inoculation-based interventions (McGuire, 1961), can help users withstand social pressure and maintain engagement when facing hostile responses. These strategies have proven effective in related areas such as misinformation correction and persuasion resistance (McPhedran et al., 2023; Roozenbeek et al., 2022), and may similarly support users in challenging GESI violations online. In contrast, the patterns observed in the Arab clusters suggest that interventions may benefit from emphasizing education and socially grounded motivations. In contexts where collective values and shared norms shape behavior, educational initiatives, awareness campaigns, and norm-based messaging may encourage users to recognize and respond to GESI violations. Such approaches can reinforce the idea that challenging discriminatory behavior aligns with community values and inclusive social norms.

Beyond platform design, the findings may also inform educational and intervention initiatives addressing online harassment and exclusion. The user profiles identified through clustering provide pragmatic reference points for understanding how individuals respond to GESI-violating content and may help practitioners and educators tailor supportive interventions. For example, individuals inclined toward internalization may benefit from support-focused approaches, while those using resistance strategies may benefit from interventions encouraging constructive online engagement. The personas derived from these clusters could therefore inform educational campaigns on responsible social media use and intervention strategies such as role-taking or inoculation-based communication approaches, consistent with research emphasizing prosocial behaviour and bystander involvement in addressing online abuse (Milosevic et al., 2022).

Limitations

While this study addresses a novel topic, includes two culturally distinct samples, and employs validated measures with a rigorously collected dataset, several limitations should be acknowledged. First, the study relied on self-reported data, which may introduce biases such as social desirability effects or inaccurate self-evaluations. To mitigate these

risks, the survey ensured anonymity and provided clear explanations and examples throughout the questionnaire.

Second, the clustering analysis was conducted using the K-means algorithm. Although additional validation procedures were implemented, clustering methods inherently involve certain methodological limitations. For instance, there is no universally accepted procedure for determining the optimal number of clusters, and clustering results may vary depending on initialization conditions and parameter choices. Moreover, the relatively low average silhouette width (0.18) indicates limited separation between clusters, suggesting some overlap between profiles. This likely reflects the continuous nature of psychological coping responses and the limited suitability of K-means for overlapping psychosocial data structures. Accordingly, the identified clusters should be interpreted as empirically derived profiles summarizing dominant patterns rather than strictly distinct user categories.

Third, the sample included more female than male participants, introducing a degree of gender imbalance. This may partially reflect real-world patterns, as women are disproportionately exposed to gender-based discrimination and online harassment and may therefore be more inclined to participate in studies addressing GESI-related issues. Nevertheless, this imbalance limits the generalizability of the findings, particularly when interpreting coping strategies that may vary by gender. Future research should aim to include more gender-balanced samples to further examine potential gender-specific coping differences.

Conclusion and future work

This study identified two dominant coping profiles in response to GESI violations on social media across both the UK and Arab GCC samples. One cluster reflects an active and engaged profile, characterized by higher self-esteem, higher self-efficacy, stronger feelings of social inclusion, and a greater tendency to adopt approach-based strategies such as education and, in the UK context, resistance. In contrast, the second cluster represents a more passive or withdrawn profile, marked by lower self-esteem, lower self-efficacy, greater perceived exclusion, and a stronger reliance on avoidance based strategies such as detachment and internalization. These findings highlight the central role of psychological resources and perceived belonging in shaping whether individuals confront or disengage from GESI violations online. Future research could extend this work by examining additional cultural contexts and exploring how coping profiles evolve over time using longitudinal or qualitative approaches.

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Author contributions Rabab Ali Abumalloh, Raian Ali, and Osama Halabi designed the original study and curated the data. All authors contributed to conceptualizing the research presented in this paper. Rabab Ali Abumalloh and Areej Babiker conducted the clustering analysis. Ala Yankouskaya designed and supervised the analytical methodology and validated the results. Rabab Ali Abumalloh and Areej Babiker wrote the first draft of the manuscript. Ala Yankouskaya, Raian Ali, and Osama Halabi reviewed and edited the draft. Raian Ali and Osama Halabi supervised the research and managed the project.

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Data availability The final data for this research is published on the Open Science Framework repository at the following URL: https://osf.io/e98pa/?view_only=82a6cd847bd0492b8c3615ba4bb675a7. http://osf.io/x7veh/overview?view_only=2c45559a820c4e47b0fbecb24af534b

Declarations

Ethics statement This study was reviewed and approved by the Hamad Bin Khalifa University (HBKU) Institutional Review Board under IRB Protocol Reference Number HBKU-IRB-2024-90. The research was conducted in accordance with the ethical standards and guidelines of the HBKU Institutional Review Board.

Consent to participate Informed consent was obtained from all individual participants included in the study.

Consent to publish Participants provided informed consent to take part in the study and agreed to the publication of the collected, non-identifiable data in academic journals and conference proceedings.

Declaration of competing interest The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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