

Expression of Psychological Distress on Instagram Using Hashtags in Russian and English: A Comparative Analysis

SAGE Open
 October-December 2018: 1–9
 © The Author(s) 2018
 DOI: 10.1177/2158244018811409
journals.sagepub.com/home/sgo


Olga Bogolyubova¹ , Philipp Upravitelev²,
 Anastasia Churilova³, and Yanina Ledovaya³

Abstract

People have been using images to express ideas, share stories, and communicate since early history. The advent of social media has made sharing images an important part of everyday life. Among other things, social networks can be used to express psychological distress; however, research on this topic is limited. The goal of this study was to explore representations of psychological distress in the Russian-speaking segment of Instagram. The study involved contrasting images labeled with hashtags in Russian with images marked by analogous Anglophone hashtags in a data set of 1,512 images. Quantitative content analysis revealed significant differences between images labeled with Russian and Anglophone hashtags. Images containing depictions of texts were significantly less frequent among images with Russian hashtags, while inanimate object depictions were more prevalent. Hashtags for fear in both languages were related not to psychological distress but to the “scary” in popular culture. Images of alcohol were associated with stress hashtags in both languages and with hashtag for depression in Russian only. Images of food were significantly more prevalent among images with Russian hashtag for stress. Current study highlights the need for culturally and linguistically appropriate online mental health interventions.

Keywords

mental health, psychological distress, image, Instagram, social networks, anxiety, depression, Russia

Since the dawn of time, artistic expression has played a vital role in human culture, development, and consciousness. Cave paintings are considered the earliest evidence of people using images to express their thoughts and make sense of the world around them (Junge, 2016). Moreover, the idea that an individual’s artistic expression has meaning beyond decorative and can provide insight into his or her mental state has a long history. The psychiatric study of art dates back to Hans Prinzhorn’s collection of the artwork produced by psychiatric patients, Emil Kraepelin’s belief that the art of institutionalized patients may offer diagnostic clues, and Sigmund Freud’s fascination with the unconscious sources of creativity (Junge, 2016; Rustin, 2008). Modern understanding of artistic expression as a means of conveying psychological distress and seeking healing is represented in the array of publications on the subject of art therapy.

The emergence of modern technologies and the advent of social media, the ubiquitous availability of smartphones and digital cameras, has pushed the question of nonprofessional artistic expression and its connection to mental health to a new level. Starting with the establishment of the first social media sites in late 1990s, the popularity of social networks has been growing at an incredible pace. According to the

Global Web Index report, there are now more than 1 billion people worldwide using at least one of social networking sites (SNS); the average user has 5.5 accounts and is active on at least three platforms, such as Facebook, Twitter, and Instagram (Mander & McGrath, 2015). The growth of SNS has been developing in parallel with the exponential growth of photos taken in the world: the number of digital images produced annually has nearly tripled since 2010 and is projected to grow to 1.3 trillion by 2017 (“Trends 2014. Worldwide Image Capture Forecast,” as cited in Mylio, 2014). Taking, editing, and posting images online has become an important part of everyday life for large numbers of people (Duggan, 2015). Not surprisingly, popular SNS provide their users with numerous instruments for creating, editing, and sharing digital images.

¹University of Malta, Msida, Malta

²Independent Researcher, Saint Petersburg, Russia

³Saint Petersburg State University, Russia

Corresponding Author:

Olga Bogolyubova, Department of Psychology, Faculty for Social Wellbeing, University of Malta, Tal-Qroqq, Msida, MSD 2080, Malta.
 Email: olga.bogolyubova@um.edu.mt



Image-based SNS provide a number of unique research opportunities, for instance, they allow for the exploration of ways in which people use images to express and convey to others not only their ideas but also mental states. Highfield and Leaver (2016) in their paper on visual social media argue that “the visual is critical to story-telling and meaning-making” and that it is central for creating and presenting online identities. Pittman and Reich (2016) provide a detailed analysis of the role of image sharing in SNS; they contend that images, in comparison to text, are more concrete and work better for conveying emotions, immediacy and social presence. Overall, current research indicates that images may be the more powerful media for conveying emotion and those internal states that do not necessarily allow for simple, straightforward verbalization.

Instagram is a popular image-based SNS launched in 2010. According to statistics, provided by the platform, the number of its users exceeded one billion as of June 2018, with 400 million new users joining over the past 18 months; approximately 60% of them access Instagram everyday (Instagram, 2016; Statista, 2018). Instagram is considered one of the fastest growing SNS: according to Pew Research Center survey, its usage doubled since 2012 (Duggan, 2015). Instagram differs from the majority of social media platforms because it is designed exclusively for photo and video sharing rather than textual content. Posts on Instagram are images or short videos, which the user can accompany by a short text and up to 30 hashtags. Hashtags are words and combination of words without spaces between them, preceded by a pound sign (#); their use allows content to be included into online conversations, which are open to all individuals using the same hashtag.

As shown above, Instagram provides great opportunities to explore social, cultural, and psychological correlates of creating digital images and sharing them in online communication. Indeed, Instagram-based research has been expanding rapidly over the past few years; however, studies of mental health-related issues on this platform are still very few. Our search yielded only four such publications. A paper by Moreno, Ton, Selkie, and Evans (2016) explored hashtags for images related to self-harm and whether these hashtags triggered the network’s content advisory warnings. Depression-related imagery was explored in two studies: one by Reece and Danforth (2017), who employed machine learning to identify markers of depression using a data set of 43,950 images from 166 Instagram users with and without depression, and another by Andalibi, Ozturk, and Forte (2015) presenting a qualitative content analysis of depression-related images and their captions. And, finally, a recent study by Ging and Garvey (2018) provided a content analysis of a large sample of images accompanied by pro-anorexia hashtags and discussed the effects of the increased visibility of such images.

One important limitation of all the studies cited above is that they exclude all posts marked with hashtags in languages

other than English from their analysis. Social media-based studies can potentially provide mental health researchers with access to societies and groups underrepresented in traditional research samples. In turn, this could open up new avenues for the exploration of cultural and cross-cultural factors in mental health. Unfortunately, these opportunities are seldom used. In our research, we aim to fill this gap by exploring how psychological distress is represented in the Russian-speaking segment of Instagram.

There are few internationally published studies on psychological distress in Russian samples and as a result, there is little reliable information on mental health in Russia. There are some important historical reasons for this, namely distorting and manipulating population-related data, abuse of psychiatry for political purposes, and the ban of psychology as a discipline. For many years, any research into population-related variables in the Soviet Union was discouraged, for instance, demographic data were being grossly distorted for political purposes since 1920s and were declared classified information in late 1940s with dire consequences for the discipline of demography and other social sciences (Tolts, 2001). The long-standing tradition of population data concealment in the Soviet Union (Tolts, 2008) and limited support of social sciences in modern Russia has not allowed for large-scale investigations into many social and psychological issues. Moreover, the engagement of psychiatry in political repressions has resulted in the withdrawal of Soviet psychiatrists from the World Psychiatric Association and in significant damage to psychiatric research and practice in the country (van Voren, 2015). Even today, there is limited expertise and interest in psychiatric epidemiology within Russia as well as notable reluctance to share existing data internationally. There is a palpable gap in available information regarding mental health of Russian populations, as evidenced by the absence of Russian data in large-scale research initiatives such as the World Health Organization (WHO) World Mental Health Survey Initiative (Demyttenaere et al., 2004; Kessler et al., 2007). As for psychology, it fell under prohibition in 1936 (Pickren, Dewsbury, & Wertheimer, 2012; Yasnitsky, van der Veer, & Ferrari, 2014) and only began to revive in the 1960s under continuing ideological pressure, which shaped the areas it was allowed to explore, behavioral health of populations not being one of them.

While professional disciplines, usually tasked with monitoring and promoting psychological health, have been severely damaged, the amount of societal events in Russian history of the 20th century, potentially relevant for mental health, has been significant (e.g., political repressions, wars and famines). The impact of these events so far has gained little attention from mental health professionals with the exception of popular writings of Russian psychologist Ludmila Petranovskaya. The latter addresses the impact of soviet legacy of oppression on the psychological functioning of people, among other things highlighting that a “Soviet citizen” was not allowed to have immaterial problems, such

as psychological concerns or emotional pain (Mendeleeva & Petranovskaya, 2015).

Given the numerous collective traumatic events of the 20th century and a long-standing tradition of repressing and stigmatizing any display of psychological problems in Russia, the overall goal of our study was to explore how psychological distress is constructed and conveyed within the Russian-speaking segment of social media and whether there are any culturally specific characteristics to this expression. The choice of an image-based network, such as Instagram, was made to allow for the exploration of the visual signifiers of psychological distress in a culture where verbalization and open exploration of such matters has been historically discouraged.

More specifically, the present study had two main objectives, aimed at achieving the overall goal. The first objective was to describe representations of psychological distress in the Russian-speaking segment of Instagram by studying images accompanied by psychological distress-related hashtags in Russian language. Hashtags are used on social media to enter one's post into a larger scale discussion, to mark the contents of one's post with a certain theme. While hashtags themselves might not be an expression of an emotion or a mental state per se, their use indicates the context in which the user wishes to place his or her image (e.g., communication of psychological distress). Therefore, in our view searching for images with such hashtags would point to image-based correlates of expressing psychological distress.

Obviously, psychological distress may be experienced and expressed in many different ways. In the present study, we chose to focus on anxiety- and mood-related conditions. Anxiety disorders and depression are among the most common psychological disorders (Kessler et al., 2009; Kessler, Chiu, Demler, & Walters, 2005), and stress is strongly associated with mental health problems (Lupien, McEwen, Gunnar, & Heim, 2009). Based on this information, hashtags containing reference to depression and anxiety were targeted in this study.

The second objective was to contrast images labeled with psychological distress-related hashtags in Russian language against images marked with corresponding internationally used Anglophone hashtags. The goal of this second step was to highlight culturally specific aspects of expressing psychological distress among Russian-speaking Instagram users. Although this approach does not allow for cross-cultural comparisons between two specific samples (people of all nationalities, including Russian, use Anglophone hashtags), it does allow exploring the intersection between the language used and images chosen to signify psychological distress. The idea that the language an individual speaks can shape his or her thinking has a long history in psychological research and has resulted in a number of interesting findings related to time perception, spatial thinking, color discrimination, and so on (Boroditsky, 2001; Winawer et al., 2007). Here, we apply the idea that the use of a particular language frames the way in which an individual sees or construes the world to

exploring imagery used to signify psychological distress on social media. Specifically, we are interested in investigating whether images marked with psychological distress-related hashtags in Russian language would be in any way different from images marked with analogous Anglophone hashtags.

Method

Data Extraction and Sampling

Hashtags. Approach to data collection was hashtag based: Two lists of hashtags related to psychological distress, in Russian and English, were generated and images marked with these hashtags were downloaded from Instagram using the network's API.

Our first choice of words included three hashtags: #тревога [anxiety], #стресс [stress], and #депрессия [depression] in Russian and their symmetrical counterparts—#anxiety, #stress, and #depression in English. However, preliminary overview of images posted on Instagram with the Russian hashtag #тревога [anxiety] revealed that a significant proportion of them were military related. This is because “тревога” in Russian can be translated not only as “anxiety” but also (and apparently more commonly so) as “alarm” or “alert,” as in military alert. This finding indicated that Russian Instagram users might be using other words to signify anxiety as a psychological state. In an attempt to capture possible alternative expressions, we supplemented our Russian list with hashtags #страх [fear] and #беспокойство [worry], and, symmetrically, added hashtags #fear and #worry to the list of hashtags in English. The final list of hashtags used in this study was as follows: #anxiety, #depression, #stress, #worry, and #fear for English and #тревога [anxiety], #депрессия [depression], #стресс [stress], #беспокойство [worry], #страх [fear] for Russian.

Images. To control for possible date-specific effects, we collected data on three separate dates. On October 2, October 21, and December 23, 2015, 60 most recent images for each preselected hashtag were downloaded via Instagram's API, resulting in a data set of 1,800 images. Duplicates, images containing commercial advertisements, or texts in languages other than Russian or English were removed from the data set. The final data set consisted of 1,512 images; of these, 842 were labeled with hashtags in English and 670 were accompanied by hashtags in Russian.

All images in this study were posted to Instagram as publicly available online; no private material in any form was used. The study did not involve contact with human participants, and no personal data were collected.

Coding

The final set of images was subjected to quantitative content analysis. Two authors independently coded 30% of the

images in the data set, and interrater agreement was good (Cohen's kappa = .64). Discrepancies were discussed and an adjusted list of codes was applied to the whole data set. The final coding book included 13 codes (see Table 1). Use of multiple codes was allowed.

Table 1. Specification of the Codes Used for Describing the Image Contents.

Code	Description
Text	Image containing a depiction of text. Text only or text dominates over image
Human Figure	Depiction of individual human figure
Human Face	Depiction of individual human face (portrait size)
Group of People	Depiction of two or more people
Body Part	Depiction of an arm, a hand, a leg, or other body part
Object	Depiction of various inanimate objects
Art	Depiction of a piece of art (a drawing or a painting)
Nature	Depiction of various natural landscapes
Cityscape	Depiction of urban landscapes
Food	Depiction of various kinds of food
Beverage	Depiction of beverages (alcoholic and nonalcoholic)
Animal	Depiction of an animal (domestic or wild)
Abstract Image	A piece of an abstract art

Data Analysis

For the purposes of data analysis, percentage of images with each code were calculated for each hashtag. Chi-square tests were used to explore the differences between the images marked with Russian and Anglophone hashtags. R language for statistical computing version 3.2.5 was employed (R Core Team, 2016).

Results

Images containing depictions of text were the most prevalent category in the whole data set ($n = 478$; 33% of all images), followed by depictions of human figure (17%) and human face (15%). However, there were significantly less images of texts in the Russian hashtag section of our data, 11% versus 48% of images labeled with Anglophone hashtags, $\chi^2(1, N = 1,512) = 233.74, p < .001$.

The most prevalent image categories in the Russian hashtag segment were human figure (21%), object (19%), and group of people (16%). In the Anglophone section of the data, the most frequent categories were text (48%), human face (15%), and human figure (14%).

Overall, the relative prevalence of image categories in the data set was different for Russian and Anglophone sections of the data (see Figure 1).

The percentages of images coded with each code within and across language groups are shown in Table 2.

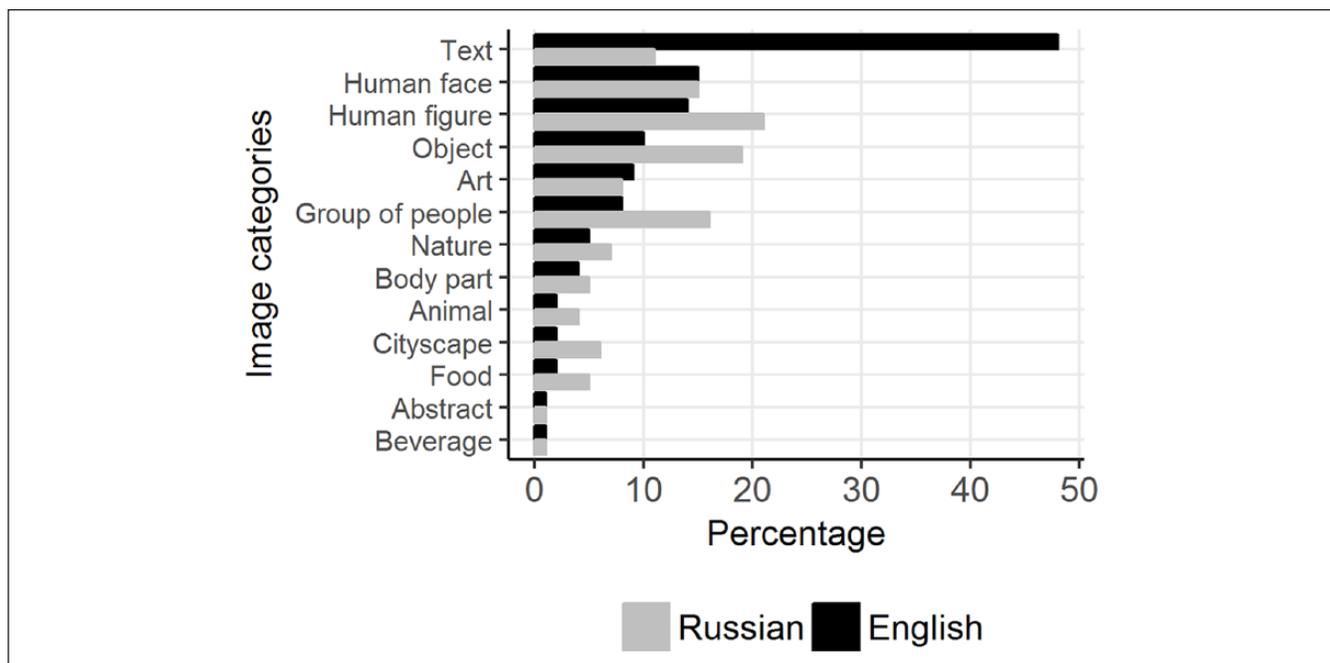


Figure 1. Distribution of image categories in the data set.
Note. Total may exceed 100% as multiple codes were allowed.

Table 2. Image Categories Across Hashtags.

Image categories	Across all hashtags	Anglophone hashtags					Russian hashtags					Across all Anglophone hashtags	Across all Russian hashtags
		Anxiety	Depression	Fear	Stress	Worry	Тревога [Anxiety]	Депрессия [Depression]	Страх [Fear]	Стресс [Stress]	Беспокойство [Worry]		
Total images	1,512	177	173	169	154	169	136	145	129	152	108	842	670
Text	33%	69%	54%	50%	29%	36%	2%	17%	9%	8%	22%	48%	11%
Human figure	17%	12%	9%	15%	15%	20%	25%	18%	22%	16%	24%	14%	21%
Human face	15%	12%	8%	9%	20%	25%	10%	22%	12%	15%	13%	15%	15%
Object	14%	10%	4%	10%	16%	10%	27%	12%	19%	22%	16%	10%	19%
Group of people	12%	6%	3%	9%	12%	11%	32%	6%	24%	9%	7%	8%	16%
Art	8%	8%	6%	14%	9%	6%	7%	10%	8%	8%	8%	9%	8%
Nature	6%	3%	2%	8%	2%	8%	7%	12%	7%	1%	11%	5%	7%
Body part	5%	7%	3%	3%	3%	4%	2%	6%	9%	5%	4%	4%	5%
Food	4%	3%	1%	1%	4%	2%	1%	5%	1%	15%	3%	2%	5%
Cityscape	4%	2%	2%	3%	1%	2%	7%	8%	1%	5%	7%	2%	6%
Animal	3%	2%	—	2%	3%	4%	1%	3%	5%	6%	5%	2%	4%
Beverage	1%	1%	—	—	5%	1%	—	3%	—	4%	—	1%	1%
Abstract	1%	1%	1%	2%	—	1%	—	1%	1%	1%	3%	1%	1%

Note. Total may exceed 100% as multiple codes were allowed.

Psychological Distress as Labeled by Hashtags in Russian

Within the hashtag #тревога [anxiety], images of groups of people (32%), objects (27%), and human figure (25%) were the most prevalent. Up to 24% of all images in this group were military related: people in military uniforms and military-related objects (62% of all images of objects posted with this hashtag).

Within the hashtag #депрессия [depression], the most prevalent image category was human face (22%), followed by human figure (18%) and text (17%). In addition, 3% of images were depictions of alcoholic drinks (included in code “Beverage”).

Within the hashtag #страх [fear], the most prevalent image category was groups of people (24%), followed by human figure (22%) and objects (19%). Notably, 25% of all images under this hashtag were pictures of people attending Halloween, other horror-themed parties, and quests.

Within the hashtag #стресс [stress], the most prevalent image category was objects (22%), followed by images of human figure (16%), human face (15%), and food (15%). This was the second hashtag in Russian containing images of alcohol in the data set: 4% of images depicted alcoholic beverages. In addition, there were significantly more food-related images posted under Russian hashtag #стресс [stress] in comparison to its Anglophone counterpart (15% vs. 4%). The difference was statistically significant, $\chi^2(1, n = 306) = 9.98, p = .002$.

Within the hashtag #беспокойство [worry], the most frequent image category was human figure (24%), followed by texts (22%) and objects (16%).

Psychological Distress as Labeled by Hashtags in English

Within the Anglophone hashtags, there was a significant overlap between images tagged with #anxiety and #depression:

28% of images with hashtag #depression were also marked with hashtag #anxiety.

Within the hashtag #anxiety, the majority of images were the depictions of text (69%), followed by images depicting human figure (12%) and human face (12%). Interestingly, six out of 11 images depicting self-harm (all found in images with the code “Body Part”) were labeled with this hashtag.

Within the hashtag #depression, 54% of images contained texts; the next most prevalent image categories were human figure (9%) and human face (8%).

Within the hashtag #fear, the majority of images also presented texts (50%), followed by human figure (15%) and art (14%). Horror-themed art in the whole data set was mostly grouped under this hashtag. Pictures of people attending Halloween and other horror-themed parties were also present in this hashtag.

Within the hashtag #stress, the most prevalent images were depictions of texts (29%), followed by 20% of images portraying human face and 16% images of objects. In addition, 5% of all images in this group depicted alcoholic beverages.

Within the hashtag #worry, 36% of all images contained texts, followed by 25% of images of human face and 20% of images depicting human figure.

Discussion

This study utilized a set of images downloaded from Instagram to explore the visual images Russian-speaking users adopt to signify psychological distress by contrasting them with images marked by analogous Anglophone hashtags.

Significant differences were found between psychological distress-related images labeled with Russian and

Anglophone hashtags. For instance, the top three categories of images labeled with Anglophone hashtags were text, human face, and human figure, while for images labeled with Russian hashtags they were, respectively, human figure, object, and group of people.

The most noticeable difference was that the images with hashtags in Russian were dramatically less likely to include depictions of text (11% vs. 48%). This finding might indicate that Russian-speaking Instagram users are less likely to verbalize psychological distress, and this is consistent with observations that verbalizing, discussing, and talking through emotional difficulties is highly problematic for Russian nationals (Levada-Center, 2017; Mendeleva & Petranovskaya, 2015). Given the history of psychology under Soviet rule and the fact that psychiatry was much too often used as an instrument of social control and political repression, there is a strong stigma attached to mental illness in Russia and there is no tradition of seeking (and receiving) psychological help. This difference may also be reflective of the idea of “talking cure” ingrained in the culture of Anglophone countries and related popularity of psychotherapy-derived ideas, such as the necessity to “talk through” problems. However, we did not conduct a comparison analysis of images posted with Russian hashtags unrelated to psychological distress and, therefore, do not know whether this difference is specific to psychological distress-related hashtags.

Another observation made in this study is related to the high prevalence of images depicting inanimate objects (e.g., school- and study-related objects, books, military service-related objects, pills and other medicine-related objects, office surroundings, etc.) in the Russian segment of the data. It appears that Russian-speaking Instagram users are more likely to use various objects to signify their internal, psychological states. Further research is necessary to explore this observation, including wider studies of images posted with hashtags in Russian.

Images with Russian hashtags were more likely to depict humans as full or partial figures, with no special accent on the face (e.g., faceless, facing away from the camera, with hair obscuring features etc.), or as part of a group. In the Russian segment of the data set, images of portrait size face reach high frequency only in hashtags #депрессия [depression] and #стресс [stress]. Existing research, mostly done with Western samples, shows that portraits of people are among the most common types of visual content shared on SNS (Bakhshi, Shamma, & Gilbert, 2014). Humans have specialized cognitive and neural mechanisms geared toward perception and processing of faces, which is crucial for social cognition and interpersonal communication (Adolphs, 2009; Kanwisher & Yovel, 2006). Moreover, research shows that photos with faces in them are more likely to engage other SNS users. For instance, Bakhshi et al. (2014) showed that photos with faces were 38% more likely to receive likes and 32% more likely to receive comments. These findings can be

applied to interpret the results of this study in two different ways.

However, it can be assumed that, in comparison to images with Anglophone hashtags, images with Russian psychological distress-related hashtags are more likely to present a human figure as the “object” of the gaze, a part of curated online identity, rather than an active actor, engaging the audience to communicate, for instance, psychological distress. An interpretation like that would be consistent with certain cultural factors related to mental health in Russia (i.e., stigma, no tradition of psychological help). It would also correspond to the recent findings from a study of 200,000 multiplayer online game players, which demonstrated that Russian players ($n = 79,164$), in contrast to players from Europe, North America, and Asia, were characterized by low level of interest in cooperation with other people (Ivanova, Ledovaya, & Artemov, 2016). Another possible interpretation is that #депрессия [depression] and #стресс [stress] are, in fact, the only two Russian hashtags in our study that are purposefully employed by Russian-speaking Instagram users to convey psychological distress and need for help and therefore, only these hashtags include pictures of faces that are the best vehicles to convey emotions and seek engagement.

Hashtags depression and anxiety were found to overlap significantly for images marked with Anglophone hashtags, but this overlap was not observed in the Russian segment of the data set. It is likely that, while Anglophone hashtags #depression and #anxiety both stand for psychological distress and, apparently, overlap not only at the level of clinically observed comorbidity of mood and anxiety disorders but also in the lay view of social media users, in the Russian data set #тревога [anxiety] is not strongly related to psychological distress. Significant proportion of military-related images found within the Russian hashtag #тревога [anxiety] reflects the dual meaning of this word in Russian: both as anxiety and as military alert. This indicates that while the term “тревога” [anxiety] is actively used by clinicians in Russia to describe anxiety, in lay language it may be, in fact, more closely associated with its other, nonpsychological meaning. This finding calls for more appropriate use of language in the development of mental health-related resources and services in the Russian segments of social media websites (i.e., in selection of keyword terms).

The results of our study indicate that the Anglophone hashtag #fear and its symmetrical Russian hashtag #страх form a distinct category, related not to psychological distress but to the “scary” in popular culture, with images in this category portraying Halloween costumes, horror-themed art, and so on.

Images of alcoholic beverages in the data set were clustered under three hashtags: #депрессия [depression], #стресс [stress], and #stress. Portrayal of alcohol consumption as a way of coping with psychological distress is well established in popular culture. However, our findings may

indicate that while the association of stress with consumption of alcohol is more universal (hashtag #stress in both studied languages included a significant proportion of images depicting alcohol), the association of depression with alcohol may be more characteristic of Russian-speaking Instagram users (no images of alcohol marked with #depression in the Anglophone section of the data).

There were significantly more food-related images posted under Russian hashtag #crpecc [stress] (15% vs. 4%). This may be indicative of a culturally specific association between experiencing stress and using food as a coping measure and a tendency to perceive food as emotionally charged. Emotional eating as a way of coping with difficult emotions have been shown to be a factor in eating disorders (Bennett, Greene, & Schwartz-Barcott, 2013; Espeset, Gulliksen, Nordbø, Skårderud, & Holte, 2012). Existing studies show that disordered eating may be no less or even more prevalent in Russia than in the West (O'Keefe & Lovell, 1999; Stickley et al., 2015). SNS-based studies may provide further insight into problematic eating behaviors and eating disorders in Russian samples.

Finally, although the study described in this article was not specifically focused on images related to self-harm, the observed distribution of these images seems to indicate an association between self-harm and anxiety in images labeled with Anglophone hashtags and an overall lower prevalence of self-harm imagery in the Russian-speaking segment: There were only 11 images of self-harm in the whole data set, and they were largely clustered under the hashtag #anxiety (six images); only two images related to self-harm were present under Russian hashtags. This is consistent with lower publicity on self-harm and its relation to mental health in Russian media, therefore, perhaps, limiting the propensity to use self-harm images as part of self-identification. Admittedly, low numbers of such pictures in our data set preclude deeper analysis and further exploration is prescribed for this unexpected finding.

Limitations

The study presented in this article makes a contribution to the growing body of research on the expressions and correlates of psychological distress on Instagram. To our knowledge, this is also the first attempt to highlight the cultural aspects of sharing psychological distress-related images on social media. However, a number of limitations must be addressed. First of all, hashtags in English can, in fact, be used by individuals from a vast array of cultural backgrounds and native languages (including Russian). Further studies aiming at making cultural inferences would need to complement hashtag-based approach with additional information about origins of the image (e.g., geolocation). Second, we do not know whether the differences found are specific to psychological distress-related images or whether they reflect a more general difference between Instagram users who

employ hashtags in Russian and users employing Anglophone hashtags. Moreover, our approach did not involve collecting any personal data from the authors of the images; therefore, we do not have any information about their demographical characteristics, geographic location, or mental health, which limits our interpretation of the data. Finally, a more in-depth qualitative analysis of the images was beyond the scope of this article; however, future research studies utilizing this data set may be able to address some of the directions identified in this explorative study in more detail.

Conclusion

Users of image-based social networks, such as Instagram, present their ideas, life experiences, and emotional states by sharing digital images with friends or broader online communities. There is a growing awareness among mental health professionals that, among other things, social networks are used to express and communicate psychological distress. This is still a nascent field of scientific inquiry and, therefore, little is known about social media as a milieu for sharing emotional distress or seeking help for mental health conditions. Cultural aspects of such behaviors is one area that so far remains largely unexplored in the field of mental health. The present study contributes to this growing field by exploring Instagram images associated with different psychological distress-related hashtags and by highlighting characteristics of such images accompanied by hashtags in Russian language, which, in turn, adds to the increased visibility and normalization of mental health topics in a culture where such discussion has been traditionally restricted and stigmatized. From the standpoint of practice, this study's research results may be utilized in the development of culturally sensitive and linguistically appropriate online mental health prevention and interventions projects by clinicians working in Russia as well as mental health practitioners elsewhere in the world, serving Russian-speaking clients. This study also opens up avenues for further research into the intersection of mental health issues and social media, such as the exploration of cross-cultural differences in the presentation of psychological distress in online contexts.

Declaration of Conflicting Interests

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

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by Saint Petersburg State University research grant (8.38.351.2015).

ORCID iD

Olga Bogolyubova  <https://orcid.org/0000-0003-3159-1926>

References

- Adolphs, R. (2009). The social brain: Neural basis of social knowledge. *Annual Review of Psychology*, *60*, 693-716.
- Andalibi, N., Ozturk, P., & Forte, A. (2015, March). Depression-related imagery on Instagram. In *Proceedings of the 18th ACM Conference Companion on Computer Supported Cooperative Work & Social Computing* (pp. 231-234). New York, NY: Association for Computing Machinery Digital Library. Retrieved from <https://dl.acm.org/citation.cfm?doi=2685553.2699014>
- Bakhshi, S., Shamma, D. A., & Gilbert, E. (2014, April). Faces engage us: Photos with faces attract more likes and comments on Instagram. In *Proceedings of the 32nd Annual ACM Conference on Human Factors in Computing Systems* (pp. 965-974). New York, NY: Association for Computing Machinery Digital Library. Retrieved from <https://dl.acm.org/citation.cfm?doi=2556288.2557403>
- Bennett, J., Greene, G., & Schwartz-Barcott, D. (2013). Perceptions of emotional eating behavior. A qualitative study of college students. *Appetite*, *60*, 187-192.
- Boroditsky, L. (2001). Does language shape thought? Mandarin and English speakers' conceptions of time. *Cognitive Psychology*, *43*(1), 1-22.
- Demyttenaere, K., Bruffaerts, R., Posada-Villa, J., Gasquet, I., Kovess, V., Lepine, J., . . . Chatterji, S. (2004). Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *Journal of the American Medical Association*, *291*, 2581-2590.
- Duggan, M. (2015, August). *Mobile messaging and social media 2015*. Retrieved from <http://www.pewinternet.org/2015/08/19/mobile-messaging-and-social-media-2015/>
- Espeset, E., Gulliksen, K. S., Nordbø, R. H., Skårderud, F., & Holte, A. (2012). The link between negative emotions and eating disorder behaviour in patients with anorexia nervosa. *European Eating Disorders Review*, *20*, 451-460.
- Ging, D., & Garvey, S. (2018). "Written in these scars are the stories I can't explain": A content analysis of pro-ana and thinspiration image sharing on Instagram. *New Media & Society*, *20*, 1181-1200.
- Highfield, T., & Leaver, T. (2016). Instagrammatics and digital methods: Studying visual social media, from selfies and GIFs to memes and emoji. *Communication Research and Practice*, *2*(1), 47-62.
- Instagram. (2016, December). Instagram today: 600 million and counting [Web log post]. Retrieved from <http://blog.instagram.com/post/154506585127/161215-600million>
- Ivanova, N. A., Ledovaya, Y. A., & Artemov, A. V. (2016, June). Real-life learning motives of online games players. In Y. Alexandrov & K. Anokhin (Eds.), *Abstracts of the Seventh International Conference on Cognitive Science* (pp. 45-46). Moscow, Russia: Institute of Psychology of Russian Academy of Sciences.
- Junge, M. B. (2016). History of art therapy. In D. E. Gussak & M. L. Rosal (Eds.), *The Wiley handbook of art therapy* (pp. 7-16). New York: Wiley-Blackwell.
- Kanwisher, N., & Yovel, G. (2006). The fusiform face area: A cortical region specialized for the perception of faces. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, *361*, 2109-2128.
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., . . . Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiologia E Psichiatria Sociale*, *18*(01), 23-33.
- Kessler, R. C., Angermeyer, M., Anthony, J. C., De Graaf, R. O. N., Demyttenaere, K., Gasquet, I., . . . Üstün, T. B. (2007). Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry*, *6*, 168-176.
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*, 617-627.
- Levada-Center. (2017, January). *Запретные темы* [Forbidden topics] [Press release]. Retrieved from <http://www.levada.ru/2017/01/10/zapretnye-temy>
- Lupien, S. J., McEwen, B. S., Gunnar, M. R., & Heim, C. (2009). Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nature Reviews Neuroscience*, *10*, 434-445.
- Mander, J., & McGrath, F. (2015). *Social media engagement summary*. GlobalWebIndex. Retrieved from <http://insight.globalwebindex.net/hs-fs/hub/304927/file-2615393475>
- Mendeleeva, D., & Petranovskaya, L. (2015, September). *Советским людям говорили «Не чувствуй», или про жизнь в скафандре* [Soviet people were told "Don't feel", or on life inside a diving suit]. Retrieved from <http://www.pravmir.ru/lyudmila-petranovskaya-sovetskim-lyudyam-govorili-ne-chuvstvuy-ili-pro-zhizn-v-skafandre/>
- Moreno, M. A., Ton, A., Selkie, E., & Evans, Y. (2016). Secret society 123: Understanding the language of self-harm on Instagram. *Journal of Adolescent Health*, *58*(1), 78-84.
- Mylio. (2014, December). One trillion photos in 2015 [Web log post]. Retrieved from <http://mylio.com/true-stories/tech-today/one-trillion-photos-in-2015-2>
- O'Keefe, P., & Lovell, D. M. (1999). Eating Disorder Inventory scores in Russia and Britain: A preliminary comparison. *European Eating Disorders Review*, *7*, 129-135.
- Pickren, W. E., Dewsbury, D. A., & Wertheimer, M. (2012). *Portraits of pioneers in developmental psychology*. New York, NY: Psychology Press.
- Pittman, M., & Reich, B. (2016). Social media and loneliness: Why an Instagram picture may be worth more than a thousand Twitter words. *Computers in Human Behavior*, *62*, 155-167.
- R Core Team. (2016). R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing. Available from <https://www.R-project.org/>
- Reece, A. G., & Danforth, C. M. (2017). Instagram photos reveal predictive markers of depression. *EPJ Data Science*, *6*, Article 15.
- Rustin, T. M. (2008). Using artwork to understand the experience of mental illness: Mainstream artists and Outsider artists. *Psycho-Social Medicine*, *5*, Doc07.
- Statista. (2018, June). Number of monthly active Instagram users from January 2013 to June 2018 (in millions) [Web log post]. Retrieved from <https://www.statista.com/statistics/253577/number-of-monthly-active-instagram-users/>

- Stickley, A., Koyanagi, A., Kuposov, R., McKee, M., Murphy, A., & Ruchkin, V. (2015). Binge drinking and eating problems in Russian adolescents. *Alcoholism: Clinical & Experimental Research*, 39, 540-547.
- Tolts, M. (2001, August). The failure of demographic statistics: A Soviet response to population troubles. In IUSSP XXIVth General Population Conference (pp. 18-24). Salvador, Brazil. Retrieved from https://www.researchgate.net/publication/233966071_The_Failure_of_Demographic_StatisticsA_Soviet_Response_to_Population_Troubles
- Tolts, M. (2008). Population trends in the Russian Federation: Reflections on the legacy of Soviet censorship and distortions of demographic statistics. *Eurasian Geography and Economics*, 49(1), 87-98.
- van Voren, R. (2015). Fifty years of political abuse of psychiatry—No end in sight. *Ethics, Medicine & Public Health*, 1(1), 44-51.
- Winawer, J., Witthoft, N., Frank, M. C., Wu, L., Wade, A. R., & Boroditsky, L. (2007). Russian blues reveal effects of language on color discrimination. *Proceedings of the National Academy of Sciences of the United States of America*, 104, 7780-7785.
- Yasnitsky, A., van der Veer, R., & Ferrari, M. (Eds.). (2014). *The Cambridge handbook of cultural-historical psychology*. Cambridge, UK: Cambridge University Press.

Author Biographies

Olga Bogolyubova is a lecturer in the Department of Psychology at the University of Malta. Her research focuses on psychological trauma and its impact on health and well-being.

Philipp Upravitelev holds a graduate degree in Psychology. He is currently an independent researcher with an interest in data analysis.

Anastasia Churilova holds a bachelor degree in Psychology and was a student in the Department of Psychology at Saint Petersburg State University when the study was conducted. She is interested in studying behavior on social media.

Yanina Ledovaya is a senior lecturer at Saint Petersburg State University. She studies online behavior and well-being of social networks users.