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Analysis of Moral Language in Self-Improvement Discourse through Natural Language Processing

By

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Abstract

Self-improvement consists of making efforts to improve various traits such as health, appearance, efficiency, etc. Previous research has identified that popular culture is increasingly portraying aspects of self-improvement as obligations, as if they were moral requirements. This moralization can create stigmatization or be prejudicial when it fosters self-obsession and perfectionism (Coeckelbergh, 2022; Kraaijeveld & Jamrozik, 2022). Recent social media studies have identified these issues among small samples of users, so the present work aims to contribute to the literature by expanding the scope and assessing if the findings of smaller studies hold true in a broader social media context and considering more self-improvement areas (Bell et al., 2024; Camacho-Miñano & Gray, 2021; Coeckelbergh, 2022). Due to the speed of information flow and norms diffusion on the internet, social media platforms are relevant spots to observe the transmission of self-improvement ideas (Puryear et al., 2025). The guiding research questions for the analyses are: (1) Is moral language present in discussions about self-improvement? (2) Are there specific topics within self-improvement discussions that tend to be framed with a higher moral tone? and (3) How is the use of moral language associated with emotions in the context of self-improvement? To answer these questions, data from the subreddit r/selfimprovement was analyzed using the LIWC software, the Moral Foundations Dictionary, and MoralBERT. Furthermore, LDA topic modeling was utilized for uncovering topics and comparing moralization among them. Findings suggest that the r/selfimprovement subreddit contains higher moral language, particularly among social-related topics and health & fitness discussions. Moreover, content with higher moral language was found to show higher negative emotion and anger language, supporting previous work on the risks of moralization. However, results also suggest that engagement with moral ideas within self-improvement may not be as negative when approached from a reflective and thoughtful perspective.

Keywords: moral psychology; self improvement; natural language processing; nlp

1 Introduction

Self-improvement is meant to help people grow, being an "essential human calling" —according to philosopher Rudolf Allers— to achieve our fullest potential (García-Alandete, 2022). However, in today's culture the desire to improve has often been portrayed with a moralized tone that has been related to increased anxiety. While self-improvement has been studied by philosophers and psychologists since long ago, the way it is experienced today requires a specific examination in its current context (Coeckelbergh, 2022).

The experience of self-improvement in contemporary society can start to be understood through the consumption behaviors around the *self improvement market.* Worth around 41.23 billion USD in 2023, companies in this industry thrive on promoting the idea that individuals must constantly optimize themselves. As a result, people are increasingly spending on products and services that claim to improve their health, sleep habits, nutrition, fitness, appearance, etc. (Zion Market Research, 2024). The size and huge economic success of the market reflect a growing social belief that humans need to engage in continuous self-optimization.

Recent critiques of such constant self-improvement pursuit suggest that it is often accompanied by moralizing messages that frame self-improvement as not only desirable but obligatory, leading to increased pressure and self-doubt (Camacho-Miñano and Gray, 2021, Coeckelbergh, 2022, Kraaijeveld and Jamrozik, 2022).

In other words, the intrinsically positive pursuit of self-improvement and choosing goals that align with one's ideals has turned into a source of pressure and stress when these goals are framed as socially expected moral obligations. Discussions around self improvement today do not simply encourage growth but frame certain specific behaviors, that are sometimes unattainable for many, as moral imperatives. Common examples of such behaviors are doing food detoxes, organic eating, and doing exercise (Baker, 2022). This can lead to the stigmatization of those who do not conform to what is perceived as "correct" or "morally right". Furthermore, these new standards transform self-care into a source of guilt (Kraaijeveld & Jamrozik, 2022).

These standards on self-improvement and related moral norms are easily spread and amplified through social media platforms, as their scale and velocity facilitate the rapid diffusion of ideas (Van Bavel et al., 2024).

Previous research has analyzed the use of moralizing language on social media platforms, as well as users' experiences when engaging with content. For instance, one study identified moralization in Instagram influencers' discourse around self-improvement, where they promote very specific behaviors as "the correct" (Baker, 2022). Other studies have shown that engagement with Instagram trends that are focused on self-improvement (such as #fitspiration for physical appearance) can lead to self-obsession, perfectionism, stress, feelings of inadequacy, and even depression (Bell et al., 2024; Coeckelbergh, 2022). While these studies have focused on either the moralizing tone or the emotional response, less is known about the specific relationship between the two, particularly how moral language contributes to the emotional experience of self-improvement. Additionally, most of these studies have been small-scale, leaving a gap in understanding how these patterns manifest on a broader scale.

This research aims to address that gap by analyzing the presence of moral language

around self-improvement in large-scale social media discussions across different sub-topics, as well as evaluating its relationship with emotions. By examining self-improvement through these lens, this study contributes to a deeper understanding of how human aspirations for growth are shaped by the cultural narratives around them. Ultimately, this project is one initial step of a larger research agenda: How can the human tendency for self-improvement be experienced in a way that leads to a truly "good life" rather than unattainable ideals?

2 Literature Review

2.1 Self-improvement

Self-improvement refers to the idea of making actions and efforts that people put into goals for changing certain traits of themselves. Such desire to change and improve some aspects will come from different types of motivations that vary among people and cultures, as well as within individuals themselves. Some argue that it could be a mechanism to try to maximize well-being, or from a different approach, it could be a way of trying to fix dissatisfaction with one area of life (Sun & Berman, 2023).

According to the self-discrepancy theory, a person can feel dissatisfied when they perceive a large gap between their *actual self* and their *ought/ideal self*. The *actual self* refers to the set of attributes that a person actually has at a given moment; the *ideal self* is the model of characteristics that a person would like to ideally have, based on their dreams and aspirations; while the *ought self* refers to what a person feels obligated to be based on social expectations and norms. These selves can be thought of from both the own person's perspective and also the perspective of significant others (Hu et al., 2022).

Further, when the *ideal self* and the *ought self* come together, they form what becomes a person's *self guide.* This *self guide* is like a compass that establishes the standards of what a person should eventually become, and serves as a reference point for self-evaluation and the direction of self-improvement efforts. Principally, people will try to improve certain things corresponding to what they believe they should eventually become, in an effort to reduce the gap between their *actual self* and their *ideal/ought selves* (Hu et al., 2022).

In such attempts to self improve, self-determination theory suggests that the motivation to truly accomplish goals depends on the type of goal one is pursuing. Sheldon and Elliot (1998) differentiated between *self concordant goals* and *controlled goals*, where the former refers to those ambitions that are autonomously motivated because they come from a person's own freely chosen desires and goals. On the other hand, the latter comes from perceived external obligations (Powers et al., 2009; Sheldon & Elliot, 1998).

Sheldon and Elliot (1998) suggest that autonomous motivation for personal goals are more predictive of success. When people feel as they had determined their own goals, they

have the ability of keeping more sustained and long term effort into reaching their objectives. Even when goals sometimes imply not-enjoyable aspects such as obstacles, people maintain their motivations more easily if their effort aligns with their intrinsic values, which helps to sustain the focus and achieve the proposed goals (Sheldon & Elliot, 1998). The alignment between one's core values and attempts to improve makes the self-improvement journey to be experienced in a way that's more neutral or pleasant even in difficult moments, through feelings of purpose and growth (Leach & Iyer, 2024).

On the contrary, when goals for self-improvement are motivated solely by external forces, thus simply *controlled goals*, the motivation is not predictive of success. In this case, the individual's personal values may not align with the goal, making it difficult for them to remain committed, especially when faced with setbacks and frustrations that are typical of any goal-pursuit process. As a result, the desire to escape negative feelings often becomes stronger than the external motivation itself, from which the person may not feel ownership and could eventually abandon the goal altogether (Sheldon & Elliot, 1998).

It is, however, not rare for people to still try to pursue *controlled goals*, which they have learned from their social environment and correspond with what they think they should improve to fulfill social expectations. Then, if they do not live up to those standards, self-criticism can arise with feelings of guilt and fear of loss of approval (Powers et al., 2009).

The self-discrepancy theory suggests that not living up to those imagined standards can cause psychological discomforts such as disappointment, shame, and guilt (Higgings, 1987, as cited in Hu et al., 2022). Leach and Iyer (2024) mention that if a person thinks too negatively about the gap between their *actual self* and their *ideal self*, the self-criticism can become rumination and be so discouraging that it reduces the possibility of improvement (Higgins 1987, Sedikides & Hepper 2009; as cited in Leach and Iyer, 2024).

This possibility of improvement is hampered when too much rumination about failure makes self-critics focus more on avoiding failure and maintaining approval than on effective actions for goal pursuit. Moreover, they also become more vulnerable to feeling more deeply all the negative emotions that come with usual setbacks from goal pursuits and daily life, thus being more easily discouraged (Powers et al., 2009).

This phenomenon of setting *controlled goals* and becoming frustrated gets exacerbated in today's social media dynamics. Now, people are more exposed to idealized versions of others; they not only have their immediate network's expectations, but they also start incorporating the values they perceive from other people in online platforms. For instance, exposure to pictures of ideal bodies makes people introject beliefs and values of what the body should look like and makes them concerned with their own bodies, provoking more self-discrepancy (Hu et al., 2022).

Many studies on self-discrepancy and self-criticism have been in this area of body image, but it does not end there. Powers et al. (2009) studied the interaction between self criticism, self concordant goal motivation, goal progress and negative affect in a group of athletes and musicians who had specific goals, and found that self-criticism was negatively correlated with perceived goal progress, suggesting that the over-focus on criticism and self-denigration may distract them from the actual goal. On the other hand, they found that self-concordant goals are related to better-perceived progress (Powers et al., 2009).

Overall, it seems that the experience of pursuing self-improvement goals is highly influenced by the motivation behind those goals. They are definitely experienced differently depending on whether the desire comes from within oneself or is shaped by external expectations. Notably, the process of self-improvement can become stressful when it is shaped by what one believes *they should do* instead of by what one truly wants. Those expectations of what one *should do* and how one *should* improve often come from the moralization of certain actions, traits, and the need to improve as a mandatory task. The following sections will expand on this idea.

2.2 Moralization

Moral Psychology describes *moralization*, in general, as the idea of people holding strong beliefs about whether something is right or wrong, and thus making moral judgments around it (Van Bavel et al., 2024). Moreover, there are some more nuanced definitions of what constitutes a moral judgement. For instance, Young et al. (2012, as cited in Malle, 2021) describe it as assessing whether a behavior is "acceptable" or "forbidden"; whereas Gold et al. (2015, as cited in Malle, 2021) frame it in terms of judging how a certain person "should" act and Koralus & Alfano (2017, as cited in Malle, 2021) define it as judging whether something is "obligatory" (Malle, 2021).

Building on these nuanced definitions and a broader scholarly review, Malle (2021) proposed an organizing framework of moral judgments with four levels of complexity that progressively build on each other.

The first level, the simplest, is *moral evaluation*, which refers to assessments of whether something is good/bad or positive/negative. These evaluations could be about almost anything, from people to ideas to decisions, and tend to occur fast and without much thorough thinking. In other words, a moral evaluation occurs in an instinctive way. However, moralization does not end there, as people often need more information to rationally assess the morality of an event, action, or situation, such as understanding the motives behind a decision (Malle, 2021).

The next level, *norm judgments*, refers to permissions —whether something is acceptable or permissible, prescriptions —if something is appropriate or should be done, and prohi-

bitions —statements about what is forbidden. Norm judgments tend to be binary when stating if something is acceptable or not, without considering any exceptions or gray areas. They reflect pre-defined ideas about what norms should be and they guide action before any action is actually taken (Malle, 2021).

Next, *wrongness judgments* involve evaluating intentional actions that presumably violate a moral norm, combining the basic evaluations and norm judgments (Malle, 2021).

Lastly, blame judgments build upon the previous three levels, in which wrongness judgments assess how blameworthy an action is according to how important the violated norm was (Malle, 2021).

2.3 Monistic vs. pluralistic theories

Malle's framework can be described as a monist theory of morality. Although it proposes four levels of understanding, it limits the core moral value to a general assessment of good vs. bad.

Among the distinct theories of morality, monist and pluralist theories are distinguishable. Monist theories rely on the idea that all notions of morality come from the same intuition about one basic value. Pluralist theories, on the other hand, propose that morality is based on different values (Graham et al., 2013).

Among the pluralist theories, The Moral Foundations Theory (MFT) is widely recognized in morality research (Graham et al., 2013).

2.4 Moral Foundations Theory

MFT's authors propose that moral values come from both evolution and culture. They suggest that a first initial *"draft"* of moral values comes by nature when someone is born, and that later in life people learn cultural rules to increase the complexity of such moral values to be able to make better moral assessments. Graham et al. (2013) suggest there exist some innate "foundations" of those moral values, called foundations after the metaphor of buildings —that might not be completely constructed but have some foundations to be built upon. Similarly, a moral foundation is an innate idea of moral values that remains to be more deeply constructed and revised through socialization (Graham et al., 2013).

Graham et al. (2013) mention there could be various moral foundations but propose their initial theory with the following five original foundations:

- Care/harm: comes from the innate need to care for children and defenseless beings. It was originally triggered by children's distress, but today, it is also manifested in the self-care culture, as an example (Graham et al., 2013).

- Fairness/cheating: comes from the instinctive need to obtain benefits for oneself from the exchanges with others. Today, it may be triggered by topics like marital fidelity (Graham et al., 2013).

- Loyalty/betrayal: it occurs from the adaptive need to form groups and create cohesion with others in communities. It is experienced in today's modern era through sports teams and nations (Graham et al., 2013).

- Authority/subversion: it develops for creating beneficial relationships with people with higher hierarchy. It can be experienced nowadays in the interactions among company members and their hierarchies, for example (Graham et al., 2013).

- Sanctity/degradation: it comes from the innate need to avoid communicable diseases. It is related to emotions such as disgust that were originally needed to help people distinguish, for example, between fresh and spoiled food. In today's culture, it can be triggered by other situations such as conservatives encountering people with non normative sexualities (Graham et al., 2013).

As indicated before, this is only one guiding framework, but the authors have invited other scholars to suggest new foundations and expand on this list. Nevertheless, this version is currently still very widely used for assessing the different types of moral beliefs that people have (Graham et al., 2013).

2.5 Moralization in social media

Moral beliefs are often shaped by social contexts, with social norms playing a key role in moral attitudes and behaviors. Social norms influence people to adjust their actions and beliefs in order to gain approval and maintain social status. Social media, as a particular social context, amplifies this dynamic. The speed and scale in which these platforms operate accelerate the diffusion of moral norms, as the nature of social media enhances communication and the rapid spread of ideas (Van Bavel et al., 2024).

Through this fast diffusion, moral language has been increasing on social media platforms. Not only do moral beliefs spread more easily through these platforms, but they also give rise to new moral ideas. Puryear et al. (2025) analyzed the dynamics of moralization on X (formerly Twitter), measuring moral language across different topics over time. To assess moralization, they used word embeddings to calculate the semantic similarity of posts to words like "wrong", "shameful", "guilt" and others. They found that some topics initially considered neutral became more closely associated with moral language (i.e., the set of words) over the years, while already moralized topics became even more so.

Compared to more neutral topics, those considered moral issues are becoming increasingly popular in social media. Puryear et al. (2025) argue that this trend may be driven by people's tendency to pay more attention to moral issues, which encourages users to engage in these discussions to gain more attention on social media. Another reason for the rise in moral discussions is the increasingly easy access to the internet, which in turn facilitates access to anonymous platforms where people feel more comfortable expressing controversial views and emotions they may not share in real life (Van Bavel et al., 2024).

Undoubtedly, morality is fundamental for a functioning society as it holds people accountable for their actions and determines some rules for peaceful living in community. The moralization of certain issues can be beneficial in many cases, such as when it helps promote justice and social responsibility. On social media specifically, having globalized platforms to give voice to important moral issues —such as the #MeToo movement helps for raising awareness more easily and promoting social support towards different kinds of issues (Van Bavel et al., 2024). However, it can also foster hate and polarization as some people identify very highly with their beliefs and dismiss opposing points of view (Van Bavel et al., 2024). Moreover, moralization can contribute to the stigmatization of those who do not conform to what is perceived as "correct" or "morally right" (Kraaijeveld & Jamrozik, 2022).

This dynamic of moralization on social media platforms extends beyond social justice issues to include more individually focused topics, such as self-improvement. Therefore, the moralization of self improvement can be recognized and analyzed on internet platforms to obtain a more deep understanding about how self improvement goals are interpreted in current society.

2.6 Moralization of self improvement

Self-improvement is sometimes discussed on social media as a moral issue, where users both replicate and consume ideas about the imperative of self-improvement and the responsibility they believe it involves. A key element in these discussions is the value placed on effort and choice: individuals who are perceived as hardworking or committed to their goals tend to be more highly regarded (Celniker et al., 2023). The belief, that people receive what they deserve based on the effort they invest, transforms self-improvement into a moral matter. In this context, those who put in the effort to improve are seen as more worthy and valuable, reinforcing moral judgments about personal responsibility and achievement (Souroujon, 2021). This focus on effort not only shapes individual perceptions of self-worth but also influences collective attitudes toward self-improvement in the broader discourse.

The underlying promise of self-improvement discourse aligns with the neo-liberal ethos of personal responsibility: *"you can choose to awaken; you can choose to be free, if only you*

shift your mindset" (Baker, 2022). As a result, individuals are seen as morally responsible and efficacious when they make choices that align with what the majority deems as the "right" or "good" actions (Patton et al., 2022). This notion of choice is present in many areas of life in which people are constantly trying to improve.

Health is one of such areas that has increasingly been viewed through a moral lens, framing the maintenance of good health as an obligation (Kraaijeveld & Jamrozik, 2022). There is a culture of "healthy self-care" being discussed as a moral imperative, in which people are expected to prioritize their health (Welsh, 2020). This phenomenon was particularly evident during the COVID-19 pandemic, when both infection status and vaccination choices became moralized, with those who were infected or unvaccinated often being perceived as morally wrong. In this context, anyone not actively working to improve their health is seen as making an undesirable or irresponsible choice (Kraaijeveld & Jamrozik, 2022).

This leads to the stigmatization of individuals who do not follow the established norms, with such individuals often being perceived as "leading mismanaged lives" (Patton et al., 2022). Critiques have defined this phenomenon as "healthism" or "the good health imperative" (Welsh, 2020). The primary issue posed by such critiques is that popular beliefs around healthy self-care promote a very specific lifestyle that is often unattainable for the general public, becoming exclusive to affluent consumers. As a result, these ideas obscure structural inequalities and complex power dynamics, ignoring the systemic barriers that many face in striving for this idealized lifestyle (Camacho-Miñano & Gray, 2021; Patton et al., 2022).

A clear example of systemic barriers to self improvement can be seen in nutrition. People who aim to improve their health and diet often moralize food choices, categorizing some as "pure" or "good" and others as "impure" or "bad", thus creating moral judgments around eating habits. Practices like "clean eating" are framed as morally superior choices by influencers in their social media (Baker, 2022). However, the issue of accessibility is often overlooked. It is not acknowledged that many individuals face significant barriers to healthier food, such as economic constraints, limited availability of nutritious options, or a lack of time to prepare healthy meals. This disregard for structural factors reinforces an exclusive, idealized vision of health that does not account for the realities faced by a large portion of the population.

Several authors have critiqued how this kind of approach creates narratives of both biological and moral superiority, which can lead to misinformation and extremism, reinforcing the moralization of everyday behaviors in ways that can exclude and stigmatize (Baker, 2022; Kraaijeveld & Jamrozik, 2022; Welsh, 2020).

Furthermore, the negative consequences of moralization exist not only at the systemic level but also at the individual level. Research on the #fitspiration hashtag on Instagram,

which aims to motivate people to improve their physical appearance, has found that engaging with such content can lead to poor body image, eating concerns and negative emotions. This is largely due to comparisons with an unrealistic body type that is often portrayed as the "healthy norm", even though it is not natural or attainable for everyone. As a result, what begins as an effort to seek inspiration often ends up leaving individuals feeling worse about themselves, paradoxically undermining the original goal of self-improvement (Bell et al., 2024).

3 Present work

This project aims to take a first step toward the larger goal of achieving a more sustainable and balanced approach to self-improvement, one that supports its original objective. That first step is to evaluate the extent of self-improvement's moralization on a large scale in today's social media, as no efforts can be made without first assessing the status quo. For this purpose, three research questions guide this research:

- RQ1. Is moral language present in discussions about self-improvement?

- RQ2. Are there specific topics within self-improvement discussions that tend to be framed with a higher moral tone?

- RQ3. How is the use of moral language associated with emotions in the context of self-improvement?

The first hypothesis is that moral language is more frequent and prevalent in self-improvement discussions, when compared to other topics of conversation. An alternative hypothesis is that self-improvement conversations do not contain moralization language in any distinctive way and that they share patterns with other random topics of conversation.

The second hypothesis is that topics around health and fitness will exhibit higher degree of moralization; although an alternative hypothesis would be that the idea of self improvement in general is becoming so much more moralized that there are no differences across topics.

Finally, the third hypothesis is that moralized content will show higher negative emotion, for which an alternative hypothesis is that moralization is completely unrelated to emotions and will not produce any differences in the negative emotional expression.

4 Data and Methods

4.1 Data

4.1.1 Data Source Rationale: Reddit

User-generated content from Reddit was leveraged for this project. Reddit is one of the most popular online platforms for public discussions on many different topics. The subreddit r/selfimprovement, in particular, ranks among the top 1% of subreddits by size, making it one of the largest and most active communities on the platform. Reddit's structure is designed so that each subreddit focuses exclusively on its designated topic, ensuring that posts and comments in r/selfimprovement are directly related to self-improvement. Therefore, analyzing these posts provides a valuable entry point into understanding people's narratives around self improvement on a large scale. Furthermore, Reddit's accessibility and the feasibility of obtaining this data, as will be described below, make it an ideal source for this research.

Moreover, the dataset provides a longitudinal perspective, containing data from the subreddit's creation in 2008 through the end of 2023. While year-by-year comparisons are not the focus of this research, this broad temporal scope helps capture steady, recurring themes and patterns. This minimizes the influence of specific short-term circumstances or events that might affect data collected during a narrower period of time.

Other benefits of Reddit are that the majority of users stay anonymous, given that usernames tend to be random words (e.g., u/AHappyPineapple). People under anonymity tend to be more honest on social media, as opposed to people who could fall into the social-desirability bias if they are answering a survey or being interviewed.

Lastly, another advantage is that there is no character limit, which allows for flexibility if people want to express larger ideas, as opposed to platforms like X where they can only share short texts.

4.1.2 Data Collection

Submissions and comments from the subreddit r/selfimprovement were downloaded from Academic Torrents. This platform enables the hosting of large-scale data through the BitTorrent protocol. It is sponsored by the Institute for Reproducible Research, which aims to increase the reproducibility of science.

Submissions and comments were also downloaded for two other subreddits as well, with the aim of using them as points of comparison: r/investing and r/homeowners. Those were chosen since they are also in the top 1% rank and are good examples of neutral topics in the sense that they are not moralized by nature and serve as a baseline of text without

significant morality.

From Academic Torrents, a torrent file containing all of the top subreddits' data was downloaded. Then, the Transmission Bittorrent Client was utilized to select and download the specific files corresponding to the subreddits r/selfimprovement, r/investing and r/homeowners. Files were downloaded in .zst format and converted into CSV files using a Python script provided by u/Watchful1 (user from Reddit), who has been largely involved in the collection of Reddit data for Academic Torrents.

4.1.3 Data Structure and Preprocessing

Submissions and comments were downloaded separately as CSV files.

For submissions, the raw CSV file for r/selfimprovement contained 185,945 unique submissions with the following metadata:

- id: ID of the submission

- created: Date and time when the submission was posted

- author: Username of who posted the submission

- score: Number of upvotes for the submission minus number of downvotes

- title: Title of submission

- selftext: Text of the submission

- num_comments: Number of comments

- link: Link to the submission

On the other hand, the raw CSV file with comments contained 1,292,476 comments with almost the same metadata. One difference is that it does not include the 'num_comments' variable; instead, it includes a "link_id" variable that links it to the ID of the original submission. Also, the text of the comment is under a variable named "body", not "selftext". Figure 1 shows a screenshot of some sample rows from the raw CSV files when read using the Python library pandas. For a data quality assessment, observe Table 1.

For the analytical purposes, the focus was put on the texts of the submissions and comments (selftext and body variables). As observed in Table 1, an important percentage of them were missing. Regarding duplicated values, the percentage in the submissions data is minimal, while for the comments they are mostly related to automatic moderator comments.

```
submissions_raw.sample(3)
```
✓ 0.0s   Python

	id	created	author	score	title	selftext	num_comments	link
147719	11bgcui	2023-02-25 02:50	u/Pain-Zestyclose	0	How can I stop giving off weird, mentally-stra...	I've been struggling with this problem for the...	1	https://www.reddit.com/r/selfimprovement/comme...
138971	zsi5gr	2022-12-22 03:44	u/fakefortia	6	Help	I'm 19.I don't know what I wanna do with my li...	6	https://www.reddit.com/r/selfimprovement/comme...
157294	13mpu66	2023-05-20 06:50	u/[deleted]	1	I hate myself and I don't know how to stop	[removed]	0	https://www.reddit.com/r/selfimprovement/comme...

```
comments_raw.sample(3)
```
✓ 0.0s   Python

	id	link_id	created	author	score	body	link
578480	hgsvqis	t3_q8mkpw	2021-10-15 18:48	u/Ancient_Sw0rdfish	3	I only care about what the people I love tell ...	https://www.reddit.com/r/selfimprovement/comme...
1254154	ka49mwg	t3_17zuepy	2023-11-20 22:34	u/sallydeath	7	Don't blame other people for your failures in ...	https://www.reddit.com/r/selfimprovement/comme...
1061186	jkz9e66	t3_13n1ln9	2023-05-20 21:08	u/omarej	1	The problem is that I can't change jobs becaus...	https://www.reddit.com/r/selfimprovement/comme...

Figure 1: Raw CSVs structure

Missing selftext in submissions	67,635 (36%) due to [removed], [deleted] and NaN values
Missing body text in comments	106,355 (9%) due to [removed], [deleted] and NaN values
Average length of submissions/comments after combining them and dropping those with less than 50 words	157 words
Duplicated submissions	821 (0.44%)
Duplicated comments	88,572 (7%)
Number of unique authors	More than 166,493 (underestimated)

Table 1: Data Quality Assessment

Furthermore, the data quality assessment shows enough variety of users (authors) for reaching more reliable conclusions. However, the number is probably underestimated since it does not account for all the submissions/comments with missing values in the author's field.

Considering the data quality assessment, the "selftext" (submissions) and "body" (comments) columns were subject to some basic steps of preprocessing for data cleaning:

- 1. Removing missing data

- 2. Removing very short texts with fewer than 50 words. This was done since the two main methods used, the "Linguistic Inquiry and Word Count" dictionary (LIWC) and the LDA topic model algorithm, work better with longer texts. LIWC creators mention that any score for text with less than 50 words should be interpreted with skepticism, so that threshold was chosen. The LDA topic model algorithm does not require a fixed length, but in general, longer texts are better for topic extraction (Boyd, 2022). More details on these methods are provided in the Methods section.

- 3. Removing posts in any language other than English using the "detect" function from the language detection Python library langdetect.

- 4. Removing duplicated entries

- 5. Basic text cleaning by removing punctuation, numbers, non-ASCII characters and links. This helps to improve the interpretability for the topic model.

- 6. Submissions and comments were merged into a single file as they are treated as simply "conversations" around self improvement.

Ultimately, after all the cleaning steps, the dataset was significantly reduced to a total of 506,574 entries, with both submissions (posts) and their related comments. However, such a data size was still more than enough for the research design, so the next analyses proceeded with it.

The same steps were used to clean the data from the r/investing and r/homeowners subreddits, in order to preserve consistency. Their final datasets contained 503,158 and 498,733 entries, respectively.

4.2   Methods

The first step in the analysis was to measure moralization using three complementary approaches: the Linguistic Inquiry and Word Count (LIWC-22) dictionary, the Moral Foundations Dictionary, and MoralBERT. The idea behind using three different methods was

to validate the results, expecting similar outcomes regardless of how moralization is understood differently by distinct theories. On the same step, LIWC was also used to measure emotional expressions in the posts and comments.

4.2.1 Linguistic Inquiry and Word Count (LIWC-22) dictionary software

After initial preprocessing, the three subreddits' final files were passed through the Linguistic Inquiry and Word Count (LIWC-22) software (Boyd et al., 2022). This tool operates on the assumption that people's language and word choices are a window that provides insight into their inner worlds: their beliefs, emotions, etc. Thus, the software provides a set of internal *dictionaries*, which are curated lists of words mapped onto psychosocial constructs and theories. These dictionaries are designed to measure the presence of such constructs in text based on the use of specific words. Specifically, LIWC-22 works by calculating a score equivalent to the percentage of words in each document that match entries in the dictionaries (Boyd et al., 2022). In this case, each document is either an individual submission or an individual comment from the subreddits, and they were compared to a set of chosen dictionaries that were relevant to the study:

- Moralization: measures judgmental words, often used for making moral evaluations (e.g., "wrong", "lazy", "deserve"), capturing the central construct of the present study. It offers a general and unidimensional measure of moralization.

- Negative emotion: evaluates words that imply general negative emotions (e.g., "bad", "hate", "hurt"). Along with its subordinate category below, it was central to addressing RQ3 on moralization and negative emotions.

- Anger: subordinate category from negative emotion, for anger emotion (e.g., "mad", "angry", "hate").

- Positive emotion: focuses on general positive emotion words (e.g. "hope", "happy", "good").

- 1st person singular: used to measure the extent to which a text was written from the author's personal perspective. In this study, it helped distinguish posts in which individuals discussed their own self-improvement from those in which they commented on others' experiences, for a more nuanced analysis in RQ2. This linguistic feature was used rather than simply separating submissions from comments, as the subreddit's dynamics often involve users sharing personal experiences within comment threads (e.g., "I", "me", "my", "myself"). To classify a document as a "first-person post," manual exploration was conducted by testing various thresholds. It was determined

that a score of 5.5 is the appropriate cutoff. Posts scoring above 5.5 primarily focus on individuals discussing their own experiences, while those below this score are often more challenging to categorize as first-person content.

The average documents' moralization scores were measured for the three subreddits and then compared to address RQ1, whereas the rest of the dimensions were only measured for the r/selfimprovement subreddit as pertinent for RQ2 and RQ3.

4.2.2 Moral Foundations Dictionary 2.0

The same LIWC software was used to load and use an external dictionary: the Moral Foundations Dictionary 2.0 (MFD 2.0) which was found on the LIWC dictionary repository. This one follows the same logic as the built-in LIWC dictionaries and it is used to obtain scores for the different moral foundations, according to the Moral Foundations Theory previously discussed. All of the five foundations have two different scores: a virtue tone, which praises positive behaviors or attitudes (e.g., honest), and a vice tone, which conveys blame or negativity (e.g., dishonest). After obtaining such scores, Python was utilized to combine the virtue and vice scores and obtain an overall score for each foundation.

Both the LIWC built-in dictionary scores and those from the Moral Foundations Dictionary were appended to the original datasets and exported as new CSV files, corresponding to each subreddit, for subsequent analysis.

4.2.3 MoralBERT

As a third method for measuring moralization, MoralBERT was employed: a set of transformer-based language models (Preniqi et al., 2024). To understand how MoralBERT works, it is helpful to review some of the key concepts underlying its architecture.

At the more general level, transformer-based language models are part of a wider methodology known as deep learning. Deep learning is a subfield of machine learning that implements algorithms that resemble the brain's neurons and are thus called *neural networks*. These networks are composed of *neurons* organized in layers, with one or more neurons per layer (Gavranović, 2024).

The input layer receives data (such as a Reddit submission or comment) and the output layer calculates a prediction (such as the probability of the text having a moral tone). In between, these layers can have one or multiple *hidden layers* that combine information from previous neurons, weighting them differently according to learned weight parameters (Gavranović, 2024).

Each neuron in the hidden layers contains a *nonlinear activation function* that performs further transformation to the data, helping the model to capture complex patterns. These
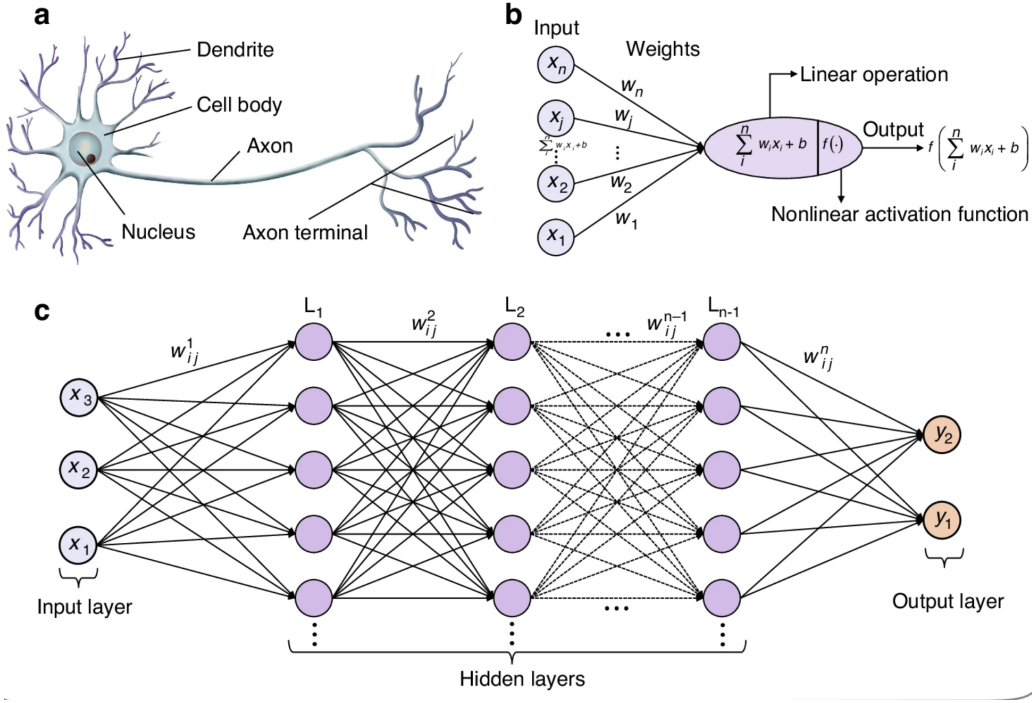
Figure 2: Extracted from Fu et al. (2024): "*a) Structure of biological neurons. b) Mathematical inferring process of artificial neurons in multi-layer perceptron, including the input, weights, summation, activation function, and output. c) Multi-layer perceptron artificial neural network*" (Fu et al., 2024).

steps progressively guide the model towards an output. During the training process, each weight is optimized to try to minimize a loss function, much like in other basic statistical models (Gavranović, 2024). An overview of this process is illustrated in Figure 2.

The main advantage of neural networks is that they allow for more flexibility and nuance in predictions where the relationship between the variables may not be linear (Gavranović, 2024). Imagine, as in real-life decision making, typically one would consider multiple aspects with varying degrees of importance and not necessarily in a linear way. Neural networks operate similarly, accounting for aspects with different weights to arrive at a decision/prediction.

More specifically, Bidirectional Encoder Representations from Transformers (BERT) models are a type of neural network that processes different parts of text input in parallel, across multiple layers of neurons. This permits the model to capture the full context of a text. After these models are trained over millions of text data, as they have been, they become capable of recognizing patterns and nuances in the human language, thus they are referred to as *language models* that serve for a variety of natural language processing tasks such as text classification (as in moral or no moral) (Devlin et al., 2019).

MoralBERT is a set of special BERT models fine-tuned for predicting the probability of a text having moral language. It was introduced by Preniqi et al. (2024) to classify documents according to the presence of vice and/or virtue language across the moral foundations, as defined by the Moral Foundations Theory. The authors took a pre-trained BERT model, specifically the BERT-base-uncased version, and fine-tuned it using a dataset of social media posts that had been previously annotated by humans. These annotations assigned moral foundation labels to the posts, with each label being defined by at least three annotators who were knowledgeable about the theory. After fine-tuning, MoralBERT is capable of assigning probabilities to any document of containing vice/virtue language in any of the moral foundations (Preniqi et al., 2024).

It differs from the dictionary-based methods as it is capable of capturing more nuances in language, similarly to how a human would do, instead of relying on simple counts of specific words like the Moral Foundations Dictionary.

To apply the MoralBERT classifier on the Reddit data, the corpus for each subreddit was downsampled due to the computational complexity of transformer-based language models. To retain the most representative content from each subreddit, the top 400 documents from each subreddit were selected based on Reddit score, using popularity as a proxy for identifying the most salient or influential ideas within each community.

The choice of 400 documents was informed by observing the scores distribution: 95% of documents have low scores ($<= 27$), while only a small proportion have high scores. Specifically, the 99th percentile scores ranged from 102 to 130 across the three subreddits, while the 99.995th percentile scores reached into the thousands. This indicated a substantial gap between the majority of the posts and a small set of highly popular ones. In the r/selfimprovement subreddit, for instance, only 368 posts had scores above 1000, suggesting that selecting 400 (for rounding up) will capture the most influential content.

These documents were then processed through the classifier using ready-to-use code provided by Preniqi et al. (2024) in their MoralBERT GitHub repository. However, it was adapted to run the classifier on the three different subreddits corpora.

For each submission/comment, MoralBERT calculated probabilities for both virtue/vice dimensions across the five different foundations. Results correspond to the probability of each text containing a given dimension. For example, consider the following submission:

"I hit rock bottom and it's the loneliest place ever. I wouldn't wish it upon anyone. But today I had to pull myself up. I'm choosing not to suffer anymore. The only one who can save me is myself. It's going to be a long journey but I will come back on top. I will find new friends and create my own chosen family. I will be successful financially and in my career. I will get the love I deserve and the family that I always wanted one day. I'm fighting for myself to win. I'm fighting to be happy again."

This submission obtained these MoralBERT scores:

- care: 0.89

- harm: 0.00

- fairness: 0.00

- cheating: 0.00

- loyalty: 0.01

- betrayal: 0.00

- authority: 0.00

- subversion: 0.00

- sanctity: 0.00

- degradation: 0.01

Furthermore, the results were then processed to generate binary labels (0 = absent, 1 = present) for each virtue and vice category across the moral foundations. A threshold of 0.3 was applied, such that posts with a predicted probability greater than 30% were assigned a positive label. This threshold was selected based on guidance provided by Vjosa Preniqi, one of the authors of MoralBERT, through personal correspondence.

Next, a global binary label was defined for each moral foundation, where a value of 1 was assigned if at least one of the corresponding virtue or vice categories was labeled as present. Finally, for each subreddit, the total number of documents labeled with each moral foundation was computed, providing a count of how frequently each foundation appeared across the sampled content in each of the subreddits.

4.2.4 Generalized Linear Models

LIWC and MFD scores were compared for statistical significance using generalized linear models (GLM) with binomial distributions and logit link functions. GLM extends linear regression models for data that is not normally distributed, such as the moralization scores that follow a long-tail distribution. In this model, the three subreddit group labels were used as categorical predictors for a binary outcome of having any degree of moral language or none at all. Any moral score different from zero was coded with a 1, and all the zeroes remained 0.

4.2.5 LDA topic modeling

After assessing moralization across the three subreddits, the next steps focused on a deeper analysis of the r/selfimprovement specifically.

"You shall know a word by the company it keeps" (Firth, 1957). This is one of the assumptions underlying Latent Dirichlet allocation (LDA), the topic modeling method used in this research to classify the r/selfimprovement documents into different topic categories. In simple terms, LDA finds groups of words that tend to co-occur and appear in similar contexts, suggesting that they correspond to the same topic.

LDA assumes that any corpus contains an underlying set of latent topics, where each topic is represented by a distribution of words that frequently appear together. Furthermore, each document in the corpus is assumed to be a mixture of these topics. Based on these assumptions, LDA is a generative probabilistic model that seeks to infer the hidden topic structure from a collection of documents and their observed words, aiming to approximate the generative process by which the corpus was created (Blei et al., 2003).

The output of such an approximation consists of two distributions: (1) a distribution of topics over the documents and (2) a distribution of words over each topic. Using those distributions, a researcher can assign each document to the topic with the highest probability and label each topic based on the words most likely to appear within that topic.

For example, if LDA is run on a collection of news articles, it might find that words like *team, game, season, coach* frequently appear together across multiple articles, suggesting they form a coherent topic. Similarly, words like *government, election, policy, senator* may co-occur and form another distinct topic. It could also group words related to topics such as entertainment, business, health, and so on.

Ultimately, the model aims at mimicking the generative process (the process by which the corpus was created) (Blei et al., 2003).

To approximate the generative process, LDA employs Dirichlet distributions as priors over the target distributions: the distribution of topics within documents and the distribution of words within topics. The parameters of these Dirichlet distributions determine whether the resulting distributions are sparse or uniform. Then, Gibbs sampling is commonly used to estimate the target distributions by iteratively updating the topic assignments for each word and improving the model (Blei et al., 2003).

In Figure 3:

- The inner plate N represents the repetition over the words in a document.

- The outer plate M represents the repetition over documents in a corpus.

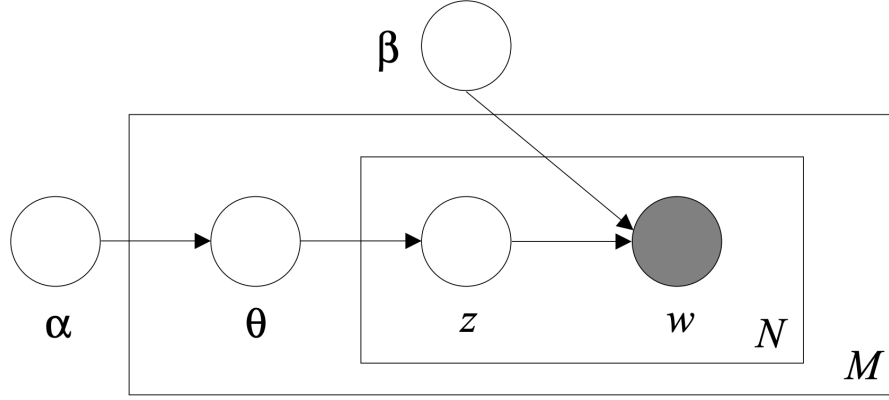- α is the hyperparameter that controls how many topics each document approximately

Figure 3: Representation of LDA. Figure extracted from Blei et al. (2003)

has.

- θ controls the specific topic distribution for each document, sampling from α.

- z is the topic assignment for each word, sampled from the distribution of θ.

- w corresponds to an observed true word.

- β controls the topic-word distribution.

(Blei et al., 2003)

Another key parameter in this method is k, which corresponds to the number of topics the model should look for. This is not automatically done by model, and it is up to the researcher to decide the k based on domain knowledge or testing.

Because of its power to identify the latent topics without needing pre-defined labels, this method was used to identify the different topics that have been discussed in the r/selfimprovement corpus.

Before implementing LDA, further preprocessing had to be done: tokenization, stop-word removal, lemmatization, and bigram creation. These preprocessing steps are essential for topic modeling, as they help focus on the most semantically meaningful content while reducing noise.

Once the data was preprocessed, several models were tested using different combinations of α, k, and other parameters. Each of them was evaluated using Gensim's coherence score and human interpretability, which was the priority as it ensured that topics showed coherent and distinct themes.

Finally, after fitting the model, documents were classified by their most probable topic and filtered to retain only those with a topic probability above 30%, ensuring that only the

most representative samples for each topic were used for comparison among topics. This filtering was applied exclusively for the topics' comparisons and did not affect the other analyses.

4.2.6 Guided BERTopic

For a supplementary analysis to better understand the nuances of morality, Guided BERTopic, a semi-supervised topic modeling algorithm, was used on the r/selfimprovement data. Its objective is to specifically search for topics related to user-specified terms, known as *seed words* (Maarten Grootendorst, 2024)

For this project, it was particularly interesting to guide the model toward finding a topic associated with morality, to identify posts/comments where users explicitly discuss the concept of morality, as opposed to only expressing moral judgments implicitly. Such a topic is unlikely to emerge so easily through the LDA unsupervised method. The chosen seed words for this use case were: *morality, moral, immoral, ethics, ethical, principle, values, good, right, wrong, duty, obligation, responsibility, ought, should, integrity, character.*

The Guided BERTopic algorithm builds on the BERT language models introduced earlier in the MoralBERT section. For this method, both the documents in the corpus and the seed words are converted into numerical representations, known as *embeddings*. The model compares each document embedding with the seed words' embedding using cosine similarity. Those documents that appear similar to the seed words' embedding are then encouraged to be grouped during the clustering step. However, if the words do not appear much or are not frequently used in similar contexts, the model may not be able to capture the desired topic (Maarten Grootendorst, 2024).

The next step after embedding generation is to perform dimensionality reduction on the embeddings. For the current project, the Uniform Manifold Approximation and Projection technique was used, and then the documents were clustered using HDBSCAN. This algorithm, unlike LDA, does not require the user to set a predefined number of topics. Instead, the model calculates them automatically (Maarten Grootendorst, 2024).

Finally, the model identifies representative words in each cluster, searching for those that are distinctive for each cluster compared to all the other clusters. For this step, Guided BERTopic gives more weight to the pre-defined seed words if they appear (Maarten Grootendorst, 2024). Those representative words then create the output of the topic modeling process, which the researcher can interpret.

5 Results

The following section shows the results after implementing the described methods.

5.1 Moralization language presence on self-improvement content

According to the three different methods used to measure moralization, the self-improvement subreddit consistently showed higher moralization compared to the other two subreddits.

Table 2 shows the predicted probabilities for the three subreddits to exhibit any level of moral language (any moral score different than zero). More details on the GLM can be found in the project's code.

Moralization measure	r/selfimprovement	r/investing	r/homeowners
LIWC	29.7%	16.2%	13.0%
MFD	79.7%	67.9%	64.9%

Table 2: Predicted probabilities of showing any level of moral language according to GLM. *Note: All p-values < .001*

Subreddit	Proportion of posts that contain high moral language	LIWC moral score average
r/selfimprovement	28.08%	0.33
r/investing	15.58%	0.19
r/homeowners	12.64%	0.15

Table 3: LIWC Moral language across subreddits

Looking more closely at the LIWC results, a score is defined as "high" if it is higher than the LIWC's manual reported mean for Reddit and other sources corpus (score of 0.25) (Boyd et al., 2022). As shown in Table 3, 28.08% of the r/selfimprovement content had high moral scores. In contrast, the other two subreddits showed high moral scores in only 12-15% of their content.

Furthermore, the r/selfimprovement corpus had a mean moralization score of 0.33, thus also high. Although 72% of the posts did not have a high moral score, the subset that did contain high moral language was substantial enough to increase its overall mean, pushing it above the moralization levels found in general Reddit + other sources corpus as reported by the LIWC.

Observing the different moral foundations for a more nuanced analysis, Figure 4 highlights how the Care value is more present than any of the other foundations in the self-improvement subreddit. This is evident in both the dictionary-based approach (the Moral Foundations Dictionary) and the deep learning classifier approach (MoralBERT), which was expected given the recent increased interest and the moral demands around the self-care culture (Welsh, 2020).
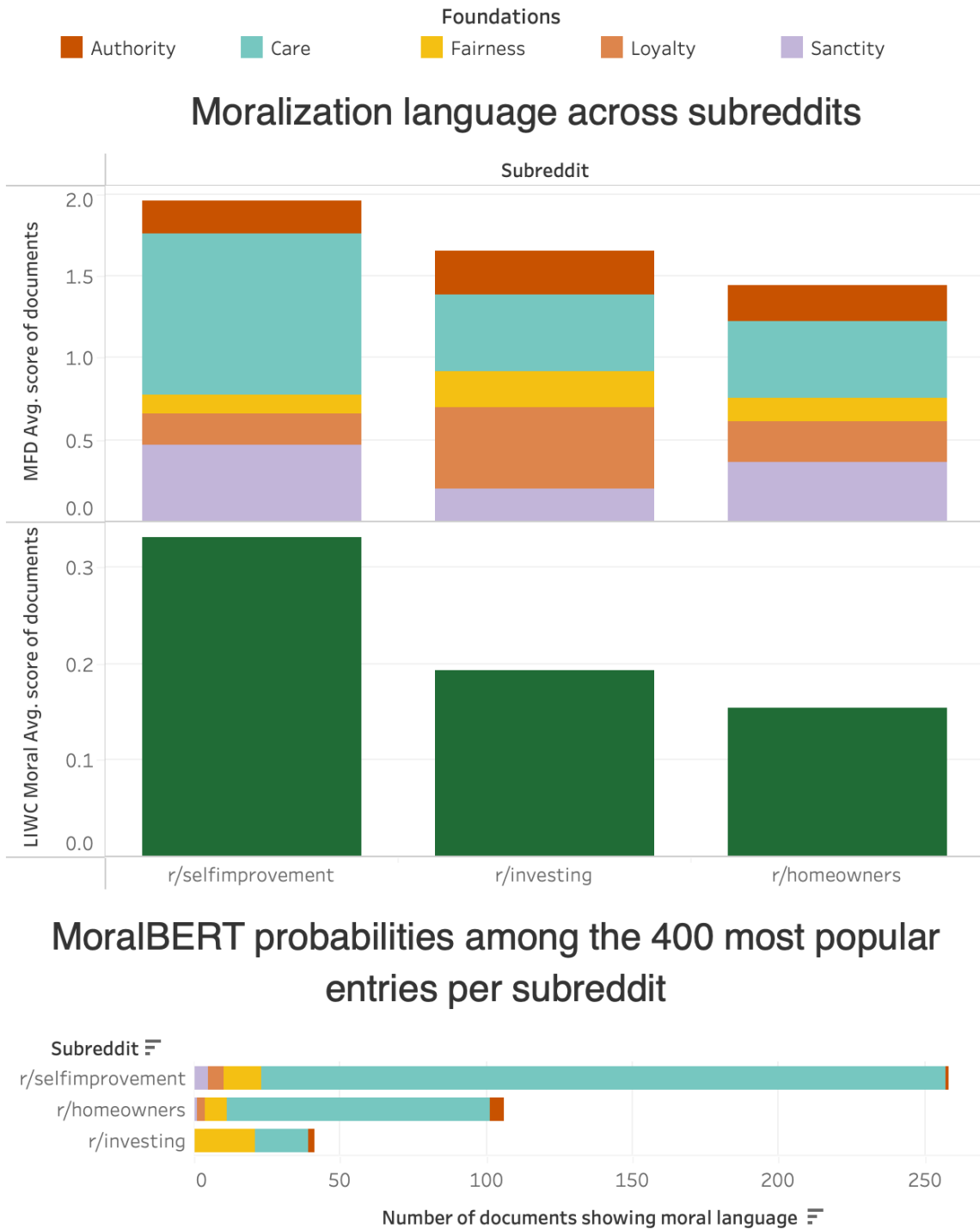
Figure 4: Moral language across subreddits with different measures

It seems that self-care, although a distinct and more specific concept, is highly present in the self-improvement agenda through narratives that frame self-care as a personal duty, something that people owe to themselves in order to become their better versions.

Overall, these results reinforce the idea that self-improvement discussions tend to be more moralized than conversations about other, more neutral topics, supporting the first hypothesis.

5.2 LDA Topic modeling

Not only is there a difference in the moralization level across subreddits, but there are also differences within the self improvement subreddit itself. As previously mentioned, LDA topic modeling was used to separate the corpus into topics.

After testing different hyperparameter settings, a model with 10 topics achieved a coherence score of 0.60, with top words that were both interpretable and distinct enough to assign meaningful labels to the topics. However, as shown in Figure 5, the first topic (labeled as 1) was overly broad and overlapped with two other topics. This was not rare, given that its top words included words such as *journey, control* and *mindset*, terms that reflect a central, but vague, theme in self-improvement. Due to its generality, this topic was excluded from further analyses, resulting in a final set of nine topics observed in Table 4.

5.3 Guided BERTopic

Looking at a more specific topic analysis, the Guided BERTopic identified 1172 distinct topics. This is expected due to the very nuanced nature of the algorithm.

Examining the first 50 topics, none of them directly showed the seed topic words, indicating that no topic among the top 50 was found directly related to the concept of morality. However, they do reveal more specific subtopics of the broader topics identified by the LDA method, further validating its findings. The representative words for each of them can be found in Table 6 in the Appendix.

Since no morality topic was found in the first 50 topics, the find_topics method was used to specifically search for the closest topic to the word "moral". The method found a topic with the words *evil, bad, hitler, good, person, villain, hero, sheep, world* and *innocence*, seeming directly related to the most pure moral definition of goodness vs. badness.

165 documents were identified under that topic. Besides manually checking the first 50 to understand the common theme, ChatGPT was prompted with the texts and the instruction *"Can you summarize these texts?"*, to which it responded: *"The documents center around deep reflections on goodness, badness, morality, and human nature. They discuss what it means to be a good or bad person, the potential for good and evil within everyone, and how*
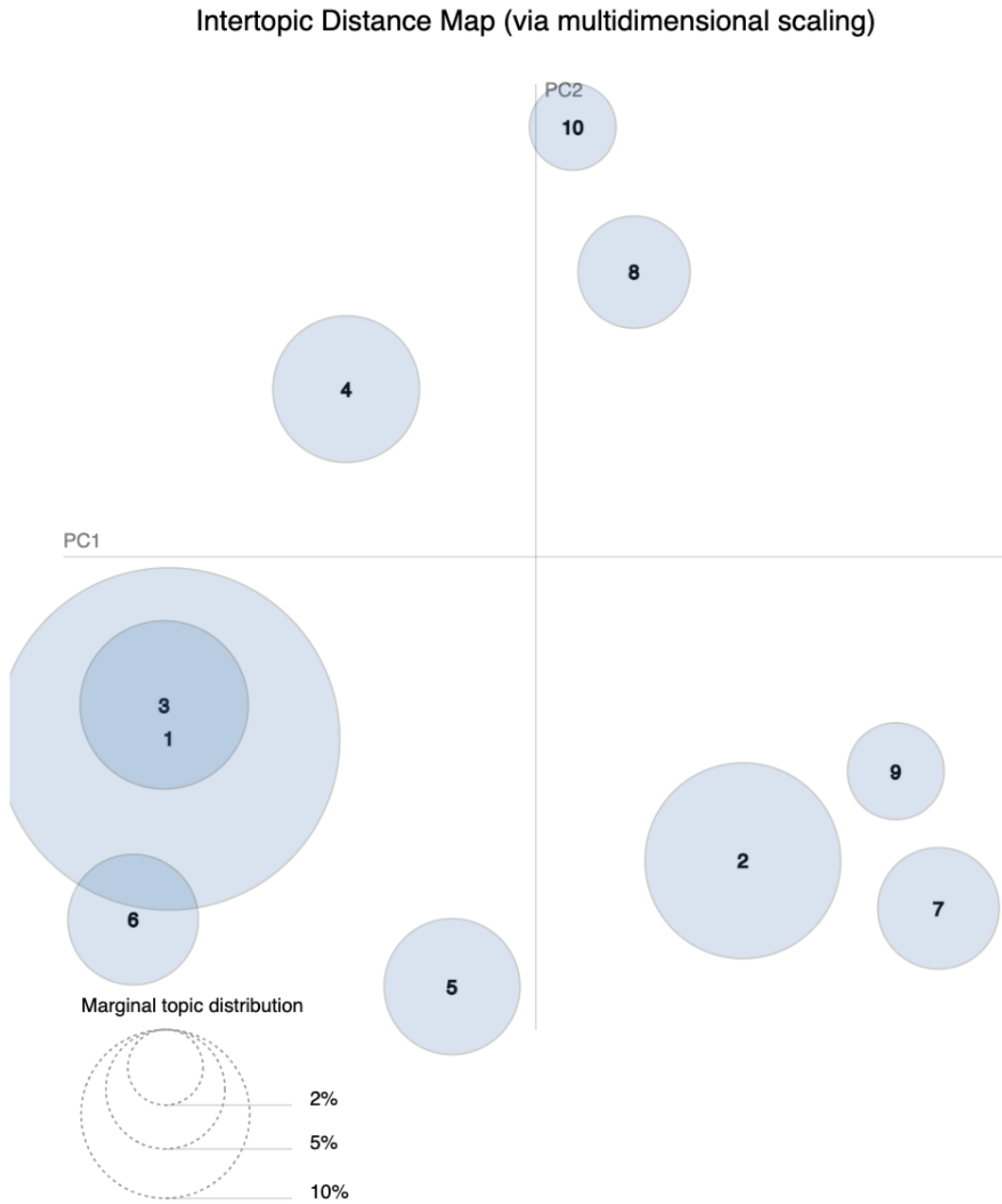
Intertopic Distance Map (via multidimensional scaling)

Figure 5: Intertopic distance map

Topic number	Topic label	Top words
2	Habits & Goals	goal, habit, gym, sleep, activity, routine, exercise, motivation, meditation, progress
3	Education & Career	job, school, high, skill, college, career, business, community, dream, study
4	Social life	friend, relationship, new, alone, hobby, partner, interest, group, fun, conversation
5	Health & Fitness	body, healthy, health, mental, weight, porn, food, physical, mental_health, addiction
6	Social media & Entertainment	social, game, medium, video, social_medium, class, youtube, music, sport, movie
7	Confidence & Dating	woman, girl, man, men, guy, sex, confidence, attractive, date, ugly
8	Family & Finances	money, parent, kid, home, family, child, house, mom, car, adult
9	Self-learning	book, comfort, cold, language, information, read, zone, reading, comfort_zone, page
10	Mental health	therapy, anxiety, therapist, depression, stress, professional, doctor, trauma, anger, angry

Table 4: LDA Topic modeling output

individuals can strive toward better behavior despite imperfections" (OpenAI, 2025). The manual inspection aligned with ChatGPT's summary.

Some notable examples of these documents are:

- *"Are you good, or are you just well behaved? A good person self actualizes, and seeks to live an honest life following their dreams. A good person tells people the harsh truths (some exceptions may apply). You get the gist of it. If your actions are truly your own and not out of fear of rejection, than continue on. But if you're a slave to fear, then you're neither nice nor good."*

- *"I would say you are not a bad person unless you purposely don't do good things and prefer to do bad things. If you make mistakes while doing something it doesn't make you a bad person. Just keep trying to do better the next time. Since you are reaching out here it makes me feel like you don't want to be a bad person. When you are going to do anything, stop and think if it going to be good or bad. Always choose good choices. While you are reaching out and trying to be a better person, reach out to Jesus. He has all the right answers and can guide you to a better life. He definitely did that for me."*

- *"I honestly don't think anything is the matter with you. No one needs to know how you think, or your thought patterns. And tbh, I get the feeling that you are most likely a really good person. It would seem that the way you view being a good person, is only going to make you a better person. Like, what's the matter with constantly judging yourself against others and wanting to be a better and better person."*

These examples illustrate an overall aspirational and reflective tone on what it means to be good and improve, without associating it with any specific action. They frame moral evaluations of goodness versus badness around character traits and intentions, rather than specific behaviors.

5.4   Moral tone across different topics

As shown in Figure 6, some topics show higher levels of moralized language than others. Notably, the top three topics, all above the LIWC's reported mean, are those related to what I will call "social topics": Confidence and Dating, Social Life, and Family and Finances.

I further validate the higher moralization results in these topics by manually reading 30 sample posts assigned to each of the topics. It was observed that most are comments on others' posts, where commenters express moral judgment on how original posters (OP) should behave in their self-improvement journeys.

Moral Expression Across Topics
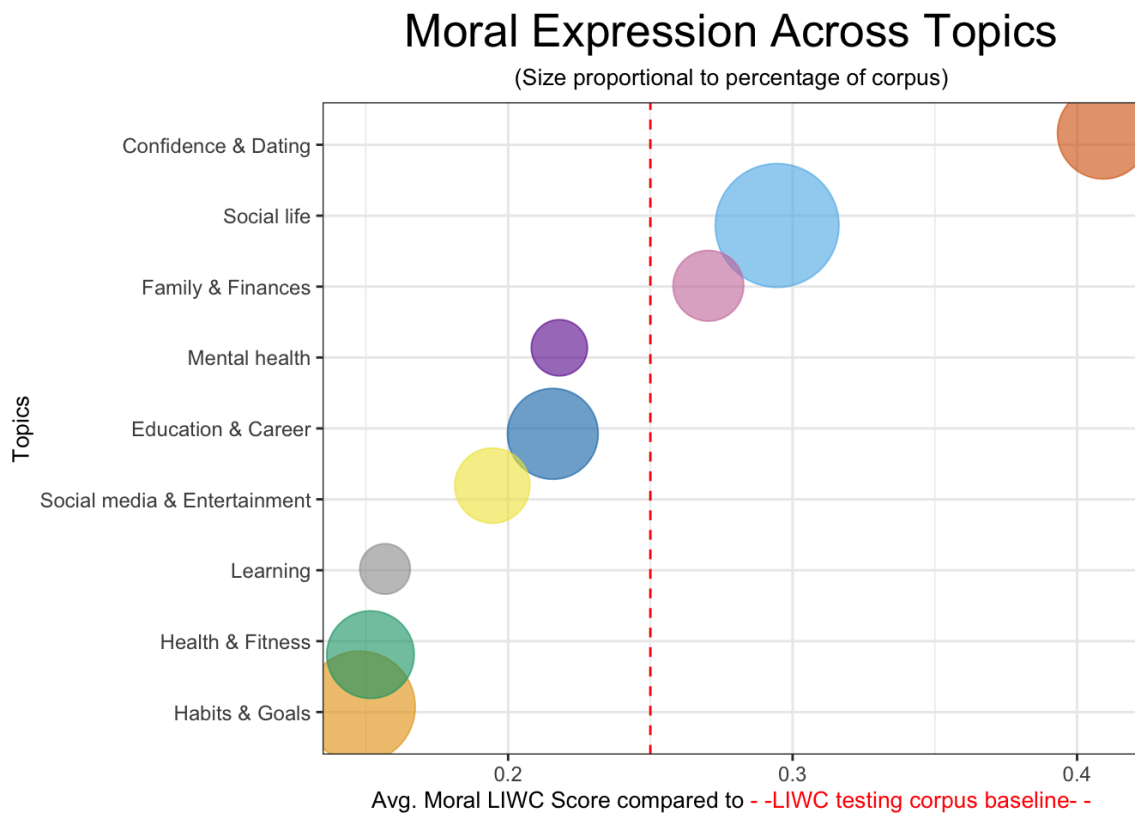(Size proportional to percentage of corpus)

Figure 6: Moral language across topics

After filtering the content to include only first-person language posts (talking about oneself), the ranking of topics by moralization remained unchanged (See Figure 10 in Appendix). A closer look at first-person, moralized posts within these "social topics" revealed that some users focus their self-improvement efforts on their interpersonal skills and family relationships, often discussing their journeys with references to others. For example:

"Cheating, abandoning my kids, trying to enforce my religion onto them, beating my wife, beating my kids. Those are the things my father would do that i learnt to condemn. But in return, i'm always judging myself. Am i good enough? If i make a mistake, am i doing the same as my father?"

This type of "social topics" content is more moralized than other, more individually focused topics. Thus, the overall moralization is largely driven by these.

Shifting focus from overall moralization to specific moral foundations, the most noteworthy finding is the significantly higher use of sanctity-related language in the Health & Fitness topic, as shown in Figure 7. This pattern aligns with both the reviewed literature and the hypothesis that this topic would be more moralized (Kraaijeveld & Jamrozik, 2022). Although Health & Fitness is not the most moralized topic overall, it stands out within the Sanctity foundation, offering a more nuanced insight into the specific type of moralization associated with this domain.

As people strive to improve in different areas of life, it is important to approach the moralization of self-improvement with nuance. The patterns of moralization clearly differ across areas, so separating them was essential for gaining a comprehensive understanding of how morality influences self-improvement.
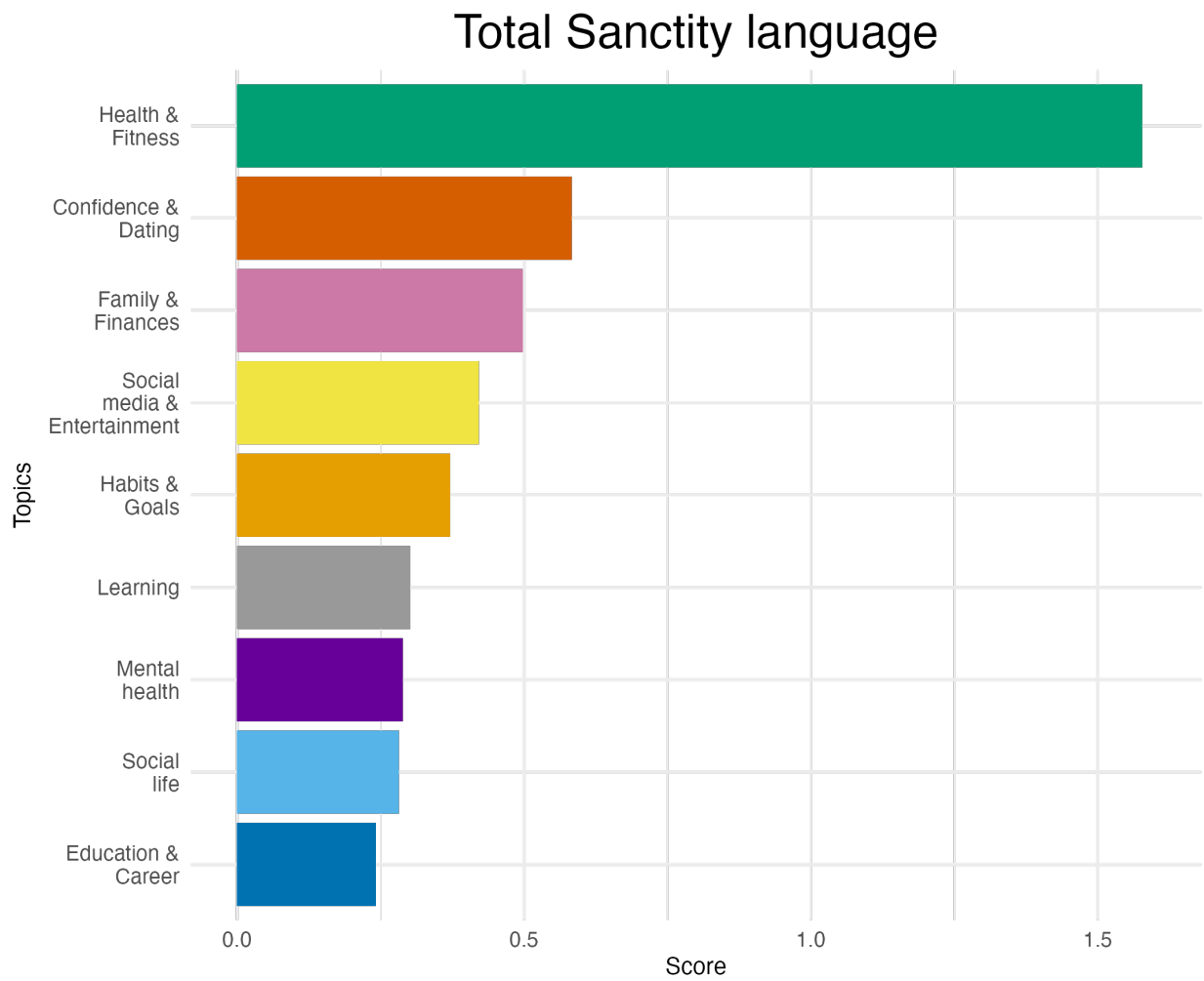
Figure 7: Sanctity language across topics

5.5   Moralization language and emotions

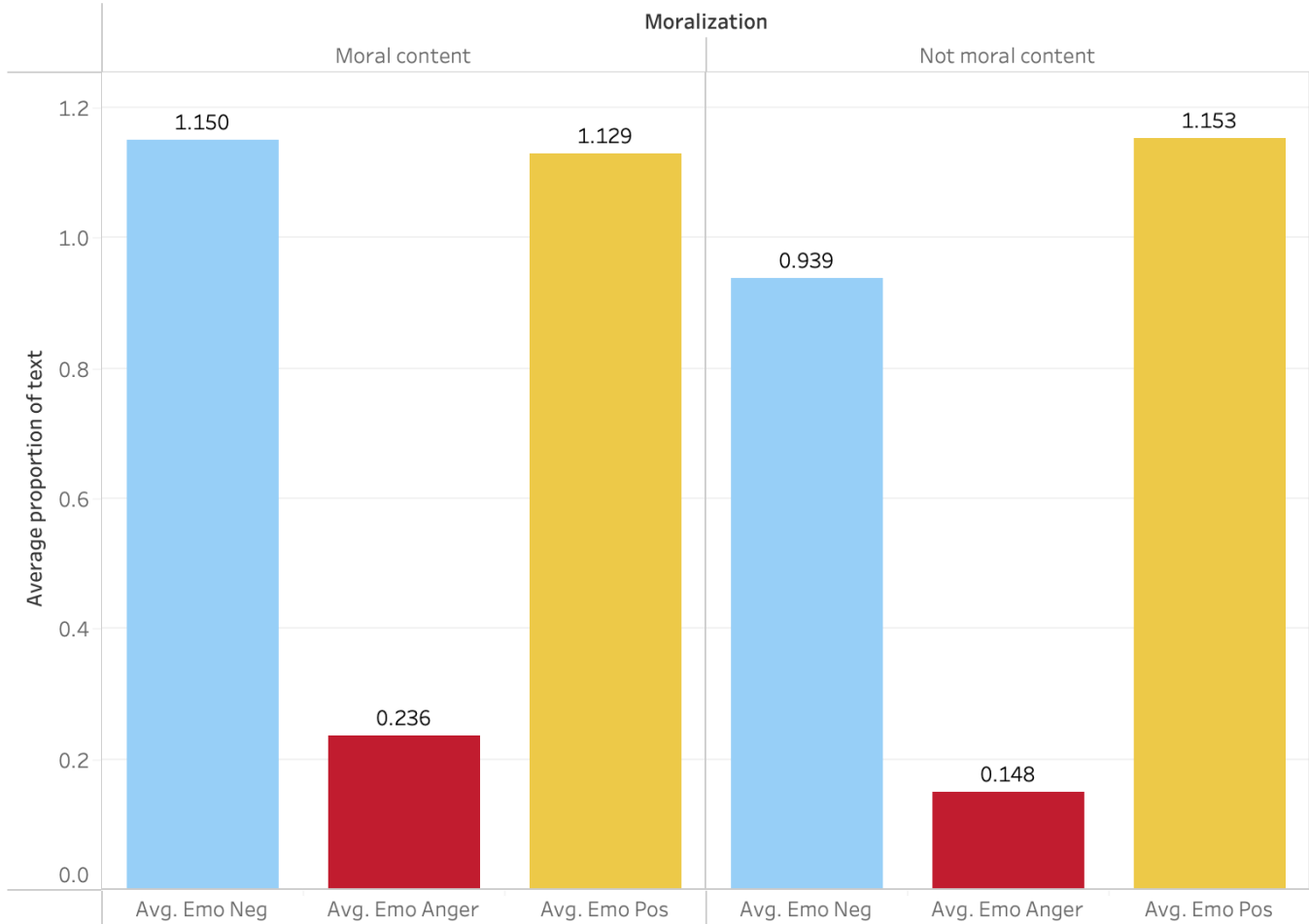Moralization tone and emotions across r/selfimprovement documents

Figure 8: Moralization and emotions

Outcome	Odds Ratio (OR)	OR 95% CI	p-value
Negative emotion	2.00	[1.98, 2.03]	$< .001$
Anger	2.22	[2.18, 2.25]	$< .001$

Table 5: Odds of expressing negative emotions when high moral content is present vs. when not, according to GLM

To further understand the dynamics of moral language in self-improvement discussions, it is important to observe that highly moralized content (score > 0.25) appears to have doubled odds of showing general negative emotion and anger.

Both differences are statistically significant according to the GLM, as shown in Table 5, and can be visualized in Figure 8. More details on the GLM can be found in the project's code.

Although this study does not assess causality, these patterns are important since existing literature already links moralization to emotions such as anger and outrage. These associations suggest that the moral framing of self-improvement may be related to emotional strain, echoing existing theories of moral pressure (Van Bavel et al., 2024).

In terms of positive emotion, there is not much difference between highly moral and non-highly moral content, as evidenced in Figure 8.

Furthermore, when examining the subset of data corresponding to content that explicitly discusses morality (as identified by the Guided BERTopic), the results reveal a very different pattern in Figure 9.
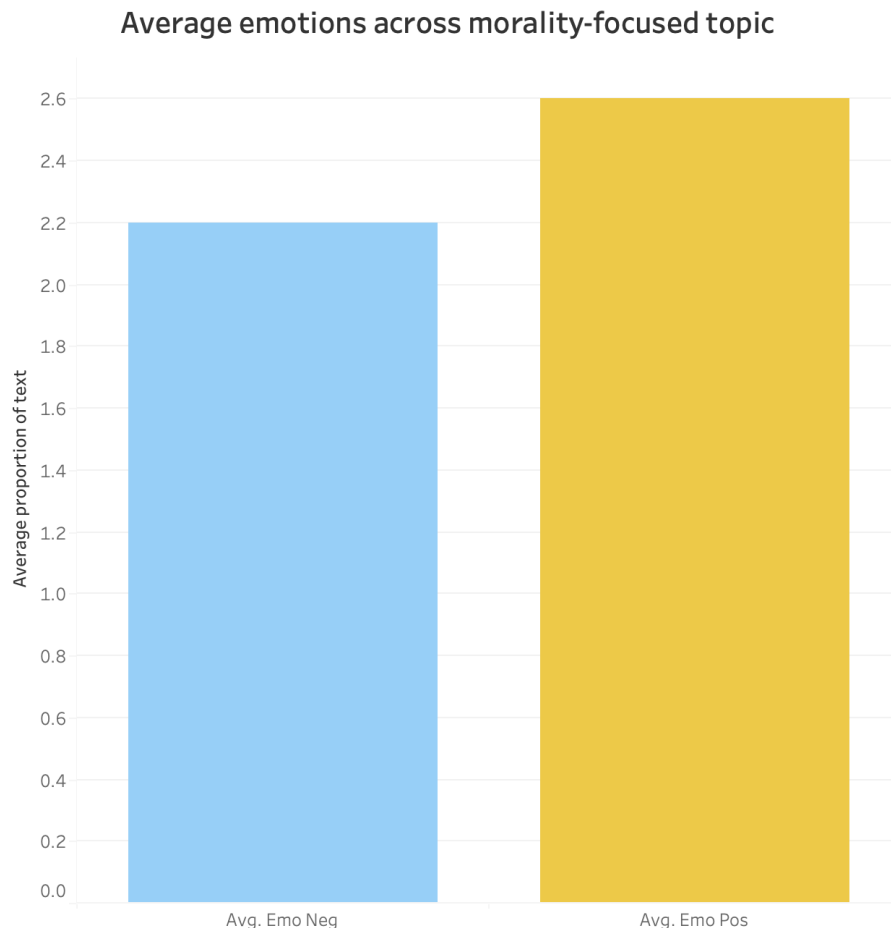
Average emotions across morality-focused topic

Figure 9: Emotions in morality-focused documents

Average LIWC scores for that subset of documents suggest that when talking about

morality explicitly, the emotional tone is stronger for both positive and negative emotions. More importantly, it is surprising that the positive emotion outweighs the negative, suggesting that perhaps thinking of self-improvement in terms of seeking "goodness" can be more positive if approached in a reflective manner that aligns with one's ideas, rather than merely framing socially promoted behaviors as mandatory.

6 Discussion

The results of the present study align with prior research while also suggesting novel interpretations.

Returning to the first research question: *Is moral language present in discussions about self-improvement?*, the results reinforce the notion that conversations surrounding self-improvement are more likely to show moralizing language compared to other topics.

Despite employing two distinct theories of morality and three measurement methods, the pattern remains consistent, as self-improvement shows higher moralization scores across all methods. Therefore, regardless of the theoretical lens applied, the findings suggest that self-improvement is more closely associated with moral ideals. This aligns with recent critiques of the contemporary self-improvement culture, in which striving for growth is not merely encouraged but is increasingly framed as a moral imperative (Coeckelbergh, 2022; Kraaijeveld & Jamrozik, 2022).

An examination of the specific moral values expressed within self-improvement discourse reveals that the care foundation stands out among others. This pattern is consistent with consumer behavior trends in the self-improvement market, where individuals increasingly invest on things related to taking care of themselves such as health & fitness products, sleep devices, etc. (Zion Market Research, 2024). As self-care becomes with time a more and more common norm, it is often treated as an unquestioned expectation. Some understand self-care culture with the idea of the power of choice being central for health, and believe that poor health outcomes are most likely caused by poor choices of behaviors. This attitude replicates a neoliberal mindset that overlooks the systemic barriers people face when trying to access self-care and other resources for self-improvement, ultimately converting the desire for improvement into a moral demand.

An interesting pattern in the data is that these moral demands are often about the improvement of others, rather than the self-improvement of the post's/comment's author. Given the nature of the subreddit, many discussions surrounding self-improvement not only focus on individuals' personal journeys but also involve commenting on other people's self-improvement experiences and reflecting on the broader concept of self-improvement. Rather than simply sharing personal experiences, the Reddit dynamics create a more complex

conversation. Thus, many moralizing comments are of people responding to others' posts, which highlights a social dimension to moralization in self-improvement contexts. Instead of reflecting on one's own personal growth, users also engage in policing moral norms on the community.

This phenomena of policing is especially salient in posts that have both moral language and high negative tone. Addressing the research question: *How is the use of moral language associated with emotions in the context of self-improvement?*, results showed that moralized content has double the odds of showing negative emotion and anger language.

Negative emotion can be observed in posts where users focus on criticizing others' perceived failures, either by criticizing the original poster or by giving advice in a way that still criticizes someone else. To illustrate how negative emotion and moral judgment intersect in practice, consider the following examples: (1) *"Man, its your fault for not setting boundaries. If my bf told me he flirts w other girls, Id leave him on the spot. Your partner should be faithful and loving and loyal. And polygamy? Screw it. Anyone who isnot loyal to one partner is, for me a looser and a ho€.".* (2) *"If you're not doing anything to attempt to treat your depression and further your life, then you're being irresponsible and potentially lazy.".*

This shows how judgment and emotional negativity are sometimes directed to others in a conversation around what "should be" done in the area of self-improvement. This resonates with previous research that has shown how individuals may express moral outrage online as a way to demonstrate moral superiority, signaling greater conviction in their values to gain social approval (Van Bavel et al., 2024). The example comments clearly show the phenomena of implicitly communicating the commenters' own moral ideas.

Even when isolating first-person experiences to distance the analysis from social commentary, posts still included references to others, as observed in the finding of "social topics" still being the most moralized among the topics. Such finding answers the research question: *Are there specific topics within self-improvement discussions that tend to be framed with a higher moral tone?*. It also suggests that social dynamics are deeply embedded in self-improvement discourse. Despite being inherently personal, self-improvement appears to often unfold through comparison, social norms and relational expectations, and this social dimension appears to evoke people's general moral awareness more strongly.

Furthermore, when examining patterns specifically related to the sanctity moral foundation, rather than general moralization, the results more closely align with previous research on the moralization of health & fitness culture. Atherton (2021), in a study on moral language in contemporary diet culture, noted that while overtly obvious moral demands around the body are becoming less popular, newer approaches to health and fitness are still discussed with a moralizing tone. Since diet culture has received a lot of backlash, ideas

such as mandatory thinness are becoming less obviously promoted but they are still being communicated indirectly through reworded phrases like "clean eating", which still convey an underlying sense of sanctity (also called purity), just with a different focus on *wellness* and *responsibility* (Atherton, 2021).

Note, however, that it is critical to distinguish between unquestioningly following social moral norms and actively engaging in reflective moral deliberation. The former is associated with *controlled goals* that may not be sustainable, whereas the latter involves integration of moral considerations into one's life philosophy (Sheldon & Elliot, 1998).

According to the topic modeling results, only a minority of the posts directly discuss goodness and the will to improve in such a reflective moral deliberation. When analyzing the content of that minority, it showed that positive emotions outweighed the negative, contrary to the general moralization results. This contradiction suggests that viewing self-improvement as morally valuable is not inherently bad. Instead, problematic outcomes such as stigmatization and frustration are more likely to arise when specific behaviors are rigidly imposed rather than when each individual decides to define their own path to self-improvement.

This interpretation aligns with Kant's notion of imperfect duties. He suggested that imperfect duties are moral obligations which allow flexibility on how to be fulfilled, requiring a general commitment to a broader goal but without demanding specific acts or entailing sanctions for not fulfilling them (Kant, 1991; Kant & Gregor, 1998). Applying this framework to self-improvement suggests that it is morally good to have a lifelong commitment to growth while being flexible on how that could look for each individual, allowing each to decide how and when to work on self-improvement.

A similar perspective is offered by Welsh (2020) regarding self-care, one manifestation of the self-improvement culture. Welsh proposes conceptualizing self-care as a hobby: a valuable pursuit for those with the financial, logistical, and temporal resources, rather than a rigid moral imperative for all (Welsh, 2020).

I argue that Welsh's idea can be extended to self-improvement more broadly. While it is an initially well-intentioned pursuit, its radicalization leads to polarization. A more balanced approach would recognize the value of self-improvement without making it an unreachable moral demand.

7 Limitations and future directions

An important limitation of this project comes from the analyses of specific example posts/comments, as they may not be necessarily representative of the entire dataset. The patterns observed at a large scale could be better explained by other examples that might have been overlooked.

Therefore, future research should test the discussed interpretations in a more controlled way. Specifically, future research could examine the specific reflections and motives that individuals have around their desire to self-improve, observing their consideration of moral demands.

Moreover, another limitation was the classification of documents by their most probable topic. LDA models each document as a mixture of topics, and this project's approach simplifies the output to facilitate comparisons across topics. However, this comes at the cost of discarding information about topic overlap.

In terms of external validity, the findings are specific to the r/selfimprovement subreddit, which may limit their applicability to broader self-improvement discourse. Other online communities, particularly those with different norms and audience demographics, may use moral language differently. However, the study provides insight into how moral language emerges in self-improvement discussions within this platform as a starting point for understanding the broader phenomena.

8 Conclusion

In conclusion, this study has provided compelling evidence on the idea that discussions around self-improvement are more likely to be framed in moral terms compared to other topics, reinforcing existing literature on the moralization of self-improvement. This suggests that the moralization of self-improvement is a widespread phenomenon, not limited to the smaller pool of Instagram influencers often studied in prior research. Importantly, the study also identified that such moralization is not uniform across different topics and that topics that involve social interactions tend to show a higher moral tone. This moralization is expressed not only through the posters' stories but also in the comments section, where participants express their moral views when engaging with others' self-improvement experiences, sometimes in a shameful manner.

These findings highlight how self-improvement discussions have evolved into conversations that sometimes display shame and moral superiority, which creates stigmatization, thus moving apart from the initial goal of motivating people to work on themselves.

In order to truly reach a good life, I suggest that the balanced middle point will be for each person to focus on their own goals from a compassionate and flexible perspective according to their own context and resources, instead of by trying to follow rigid moral standards that do not account for each person's individual circumstances. Only that way can self-improvement become a process of growth where we can achieve our fullest potential.

Data and Code Availability Statement

Raw data can be downloaded from Academic Torrents. Click here for download instructions.

Code for preprocessing and analyses can be found on the project's Github repository.

References

Academic torrents [Academic torrents]. (n.d.). Retrieved April 27, 2025, from https://academictorrents.com/

Atherton, E. M. (2021). Moralizing hunger: Cultural fatphobia and the moral language of contemporary diet culture. [Publisher: Western University (FPQ)]. *Feminist Philosophy Quarterly*, *7*(3), 1–36. https://doi.org/10.5206/fpq/2021.3.10836

Baker, S. A. (2022). Alt. health influencers: How wellness culture and web culture have been weaponised to promote conspiracy theories and far-right extremism during the COVID-19 pandemic. *EUROPEAN JOURNAL OF CULTURAL STUDIES*, *25*(1), 3–24. https://doi.org/10.1177/13675494211062623

Bell, B. T., Talbot, C. V., & Deighton-Smith, N. (2024). Following up on #fitspiration: A comparative content analysis and thematic analysis of social media content aiming to inspire fitness from 2014 and 2021. *PSYCHOLOGY OF POPULAR MEDIA*. https://doi.org/10.1037/ppm0000523

Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent dirichlet allocation [Publisher: JMLR.org]. *J. Mach. Learn. Res.*, *3*, 993–1022.

Boyd, R., Ashokkumar, A., Seraj, S., & Pennebaker, J. (2022). The development and psychometric properties of LIWC-22. *Austin, TX: University of Texas at Austin*. https://www.liwc.app

Camacho-Miñano, M., & Gray, S. (2021). Pedagogies of perfection in the postfeminist digital age: Young women's negotiations of health and fitness on social media. [Publisher: Routledge]. *Journal of Gender Studies*, *30*(6), 725–736. http://proxy.uchicago.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=hlh&AN=151667250&site=eds-live&scope=site

Celniker, J. B., Gregory, A., Koo, H. J., Piff, P. K., Ditto, P. H., & Shariff, A. F. (2023). The moralization of effort. [Place: US Publisher: American Psychological Association]. *Journal of Experimental Psychology: General*, *152*(1), 60–79. https://doi.org/10.1037/xge0001259

Coeckelbergh, M. (2022, January 1). *Self-improvement : Technologies of the soul in the age of artificial intelligence.* Columbia University Press. https://research.ebsco.com/linkprocessor/plink?id=d6c03c14-eee3-3085-a20e-3cdf5008a557

Devlin, J., Chang, M.-W., Lee, K., & Toutanova, K. (2019). BERT: Pre-training of deep bidirectional transformers for language understanding [_eprint: 1810.04805]. https://arxiv.org/abs/1810.04805

Firth, J. (1957). A synopsis of linguistic theory, 1930-1955 [Publisher: Basil Blackwell]. *Studies in Linguistic Analysis*.

Fu, T., Zhang, J., Sun, R., Huang, Y., Xu, W., Yang, S., Zhu, Z., & Chen, H. (2024). Optical neural networks: Progress and challenges. *Light: Science & Applications*, *13*(1), 263. https://doi.org/10.1038/s41377-024-01590-3

García-Alandete, J. (2022). Striving for personal perfection: Rudolf allers's psycho-ethic-metaphysical approach to character and self-improvement. *Journal of Religion and Health*, *61*(4), 3363–3383. https://doi.org/10.1007/s10943-022-01605-6

Gavranović, B. (2024). Fundamental components of deep learning: A category-theoretic approach [_eprint: 2403.13001]. https://arxiv.org/abs/2403.13001

Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S. P., & Ditto, P. H. (2013, January 1). Chapter two - moral foundations theory: The pragmatic validity of moral pluralism. In P. Devine & A. Plant (Eds.), *Advances in experimental social psychology* (pp. 55–130, Vol. 47). Academic Press. https://doi.org/10.1016/B978-0-12-407236-7.00002-4

Hu, C., Cao, R., Huang, J., & Wei, Y. (2022). The effect of self-discrepancy on online behavior: A literature review. [Place: Switzerland]. *Frontiers in psychology*, *13*, 883736. https://doi.org/10.3389/fpsyg.2022.883736

Institute for reproducible research. (n.d.). Retrieved April 27, 2025, from https://reproducibilityinstitute.org/w/

Kant, I. (1991). *The metaphysics of morals.* Cambridge University Press.

Kant, I., & Gregor, M. J. (1998). *Groundwork of the metaphysics of morals.* Cambridge University Press. http://proxy.uchicago.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=55559&site=ehost-live&scope=site

Kraaijeveld, S. R., & Jamrozik, E. (2022). Moralization and mismoralization in public health. *Medicine, Health Care and Philosophy*, *25*(4), 655–669. https://doi.org/10.1007/s11019-022-10103-1

Leach, C. W., & Iyer, A. (2024). Moral improvement of self, social relations, and society [Publisher: Annual Reviews Type: Journal Article]. *Annual Review of Psychology*, *75*, 295–310. https://doi.org/https://doi.org/10.1146/annurev-psych-032420-031614

Maarten Grootendorst. (2024). *BERTopic.* https://maartengr.github.io/BERTopic/algorithm/algorithm.html

Malle, B. F. (2021). Moral judgments [Publisher: Annual Reviews Type: Journal Article]. *Annual Review of Psychology*, *72*, 293–318. https://doi.org/https://doi.org/10.1146/annurev-psych-072220-104358

OpenAI. (2025). ChatGPT (april 2025 version). https://openai.com/chatgpt

Patton, C., McVey, M., & Hackett, C. (2022). Enough of the 'snake oil': Applying a business and human rights lens to the sexual and reproductive wellness industry [Edition:

2022/03/02 Publisher: Cambridge University Press]. *Business and Human Rights Journal*, *7*(1), 12–28. https://doi.org/10.1017/bhj.2021.51

Powers, T. A., Koestner, R., Lacaille, N., Kwan, L., & Zuroff, D. C. (2009). Self-criticism, motivation, and goal progress of athletes and musicians: A prospective study. *Personality and Individual Differences*, *47*(4), 279–283. https://doi.org/10.1016/j.paid.2009.03.012

Preniqi, V., Ghinassi, I., Ive, J., Saitis, C., & Kalimeri, K. (2024). MoralBERT: A fine-tuned language model for capturing moral values in social discussions [event-place: Bremen, Germany]. *Proceedings of the 2024 International Conference on Information Technology for Social Good*, 433–442. https://doi.org/10.1145/3677525.3678694

Puryear, C., Brady, W. J., & Kteily, N. (2025). The dynamics of moralization on social media.

Sheldon, K. M., & Elliot, A. J. (1998). Not all personal goals are personal: Comparing autonomous and controlled reasons for goals as predictors of effort and attainment [Publisher: SAGE Publications Inc]. *Personality and Social Psychology Bulletin*, *24*(5), 546–557. https://doi.org/10.1177/0146167298245010

Souroujon, G. (2021). The traps of meritocracy. a tour of the most significant problems that hide the merit [Publisher: Centro Estudios Politicos Constitucionales]. *Revista de Estudios Politicos*, (191), 59–80. https://doi.org/10.18042/cepc/rep.191.03

Sun, J., & Berman, J. Z. (2023, January 30). People prioritize personal fulfillment over morality in the context of self-improvement. https://doi.org/10.31234/osf.io/gd5pw

Van Bavel, J. J., Robertson, C. E., del Rosario, K., Rasmussen, J., & Rathje, S. (2024). Social media and morality [Publisher: Annual Reviews Type: Journal Article]. *Annual Review of Psychology*, *75*, 311–340. https://doi.org/https://doi.org/10.1146/annurev-psych-022123-110258

Welsh, T. (2020). The affirmative culture of healthy self-care: A feminist critique of the good health imperative [Publisher: University of Toronto Press]. *International Journal of Feminist Approaches to Bioethics*, *13*(1), 27–44. https://doi.org/10.3138/ijfab.13.1.02

Zion Market Research. (2024). *Self-improvement industry prospective.* https://www.zionmarketresearch.com/report/self-improvement-market#:~:text=In%20terms%20of%20revenue%2C%20the,USD%2081.77%20billion%20by%202032.
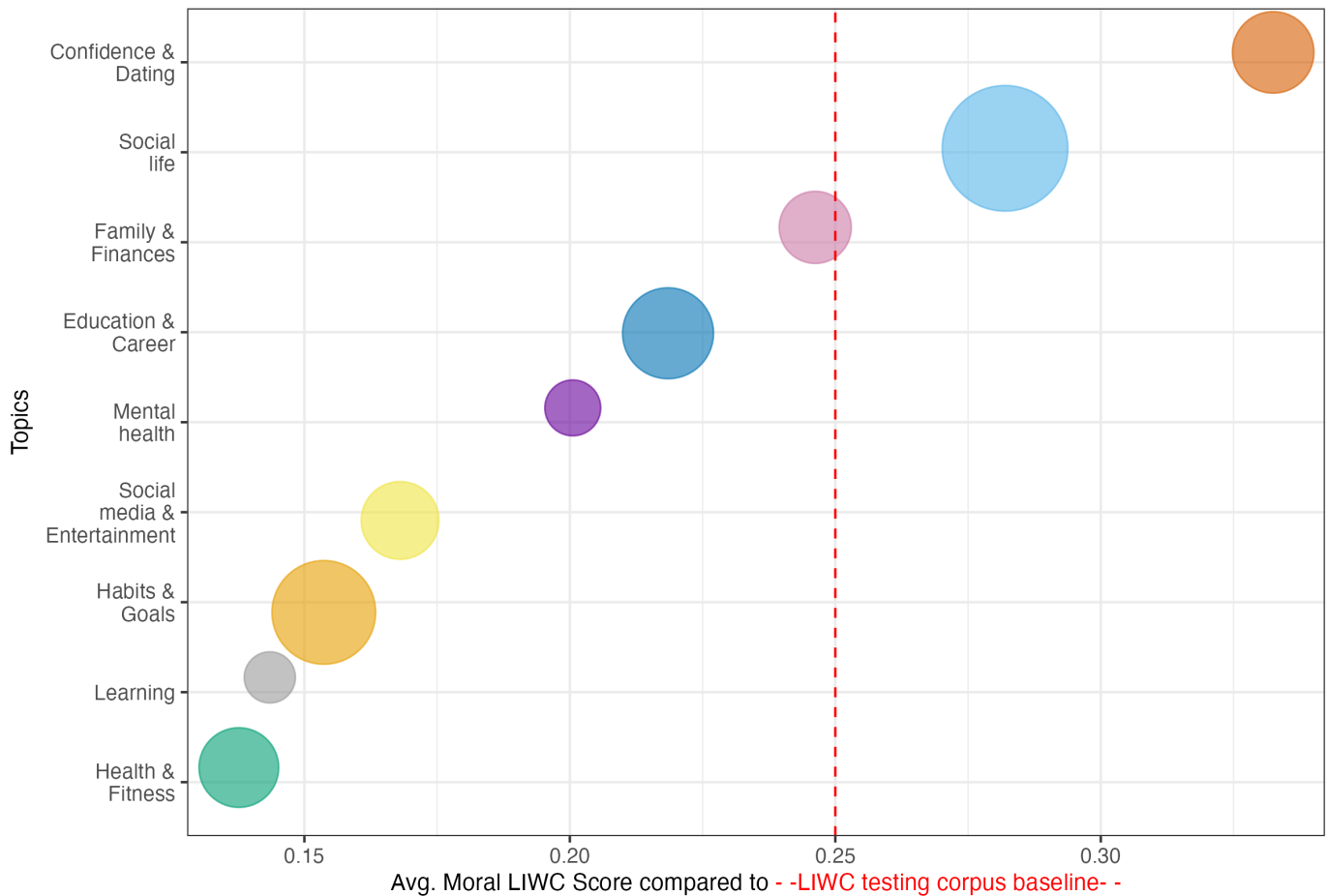
Appendix

Figure 10: Moral language across topics, keeping only posts in first person

Table 6: BERTopic Output

Topic number	Topic name
1	media, instagram, phone, facebook, deleted, social, delete, apps, tiktok, app
2	shes, girl, relationship, ex, broke, told, girlfriend, friendship, hurt, friend
3	porn, masturbation, nofap, addiction, masturbating, masturbate, sex, fap, watching, sexual
	Continued on next page

43

Table 6 – continued from previous page

Topic number	Topic name
4	meditation, thoughts, negative, mindfulness, breath, breathing, meditating, meditate, mind, positive
5	games, gaming, video, game, playing, play, videogames, played, gamer, pc
6	friends, groups, friendships, meetup, meet, group, friendship, clubs, club, join
7	book, books, reading, read, fiction, pages, speed, reader, influence, author
8	ugly, attractive, looks, beauty, beautiful, appearance, attractiveness, personality, unattractive, look
9	therapist, therapy, therapists, insurance, sessions, session, appointment, sliding, counseling, issues
10	alcohol, drinking, sober, drink, drunk, alcoholic, beer, sobriety, aa, drank
11	forgive, forgiveness, mistakes, mistake, guilt, shame, forgiving, apologize, apology, past
12	men, masculine, masculinity, feminine, women, gender, man, woman, femininity, male
13	relationship, partner, single, dating, relationships, romantic, date, happy, happiness, romance
14	adhd, diagnosed, medication, diagnosis, symptoms, meds, executive, doctor, psychiatrist, disorder
15	journaling, journal, write, writing, paper, entries, journals, diary, journalling, prompts
16	improvement, self, improving, improve, journey, improvements, improved, better, version, oneself
17	degree, college, engineering, bachelors, trade, debt, education, school, jobs, field
18	failure, fail, success, failures, failing, failed, succeed, successful, fear, afraid
19	smoking, nicotine, smoke, quit, cigarette, vaping, cigarettes, vape, smoker, smoked
20	happiness, happy, unhappy, joy, happier, contentment, pleasure, unhappiness, state, content
21	discipline, motivation, disciplined, motivated, action, motivate, goal, motivational, achieve, goals
22	anger, angry, rage, emotion, calm, mad, emotions, frustration, temper, control
23	conversation, questions, conversations, listening, silence, talk, ask, talking, listener, topic
24	jokes, funny, joke, humor, laugh, comedy, laughing, humour, joking, comedians

Continued on next page

Table 6 – continued from previous page

Topic number	Topic name
25	breakup, ex, relationship, broke, breakups, hes, heal, heartbreak, break, boyfriend
26	loneliness, lonely, solitude, company, loner, enjoy, isolated, feeling, isolation, social
27	goals, goal, setting, achieve, set, measurable, term, smaller, realistic, plan
28	height, tall, taller, shorter, short, women, girls, guys, men, attractive
29	jealousy, jealous, envy, envious, emotion, feelings, comparing, jealously, compare, feeling
30	art, drawing, draw, creative, artist, creativity, artists, painting, artistic, animation
31	gratitude, grateful, thankful, journal, practice, practicing, write, appreciation, positive, gratefulness
32	suicide, suicidal, kill, hotline, die, ideation, killing, death, prevention, commit
33	mom, mother, shes, mum, mothers, moms, dad, child, father, parents
34	habit, habits, cue, reward, atomic, routine, trigger, stick, div, build
35	anxiety, panic, anxious, attacks, breathing, attack, calm, stress, meditation, disorder
36	martial, boxing, arts, bjj, mma, jitsu, jiu, muay, thai, fight
37	driving, drive, license, drivers, car, driver, parking, test, road, traffic
38	depression, depressed, medication, doctor, therapy, clinical, therapist, depressive, meds, cure
39	dopamine, detox, gratification, reward, activities, brain, receptors, pleasure, instant, levels
40	weed, smoke, smoking, smoked, cannabis, quit, marijuana, quitting, high, pot
41	procrastination, procrastinating, procrastinate, task, tasks, procrastinator, deadline, deadlines, procrastinated, procrastinators
42	virgin, virginity, sex, virgins, girl, lose, losing, girls, woman, sexual
43	parents, rent, roommates, apartment, living, house, home, roommate, lease, renting
44	love, loving, self, unconditional, loved, worthy, accept, unconditionally, means, accepting
45	hair, bald, balding, shave, beard, shaved, baldness, hairline, shaving, finasteride
46	confidence, confident, competence, abilities, build, self, boost, feedback, trust, doubt
47	cold, showers, shower, water, warm, hot, temperature, benefits, ice, winter

Continued on next page

Table 6 – continued from previous page

Topic number	Topic name
48	fear, fears, afraid, scared, courage, scary, heights, fearful, overcome, brave
49	anxiety, social, anxious, situations, exposure, socially, awkward, strangers, interactions, public
50	tinder, dating, apps, matches, online, dates, meet, date, match, meeting